WinActorEye
Operation Manual

NTT ADVANCED TECHNOLOGY CORPORATION

Contents

1 Introduction

1.1 About this document

This is the operation manual for WinActorEye.
This manual is intended for those who create scenarios for WinActor using WinActorEye.

1.2 Trademarks

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1.3 Notes on this manual

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  The copyright of this manual belongs to NTT, Inc. and NTT ADVANCED TECHNOLOGY CORPORATION.
- The descriptions in this manual assume that users understand Windows operations and functions. For information that is not described in this manual, see the documents provided by Microsoft.

1.4 Recommended environment

In addition to the contents described in "Recommended environment" in "WinActor Operation Manual," it is recommended that the environment in which WinActorEye is used meets the specifications described in "1.4.1 Hardware environment" and "1.4.2 Software environment."

1.4.1 Hardware environment

Table 1-1. Recommended specifications

Item	Recommended specifications
CPU	2.5 GHz or higher x86 or x64 processor **4 cores or more**

1.4.2 Software environment

Table 1-2 shows the environmental conditions (software) for using Microsoft OCR.

Table 1-2. Environmental conditions (software) for Microsoft OCR

Item	Outline specifications
OS	Microsoft Windows 10 Pro Microsoft Windows Server 2016 Microsoft Windows Server 2019
Microsoft .NET Framework	Version 4.8 or higher

1.5 Launching WinActorEye

To open the WinActorEye window, click "WinActorEye" in the "Tool" menu of WinActor.

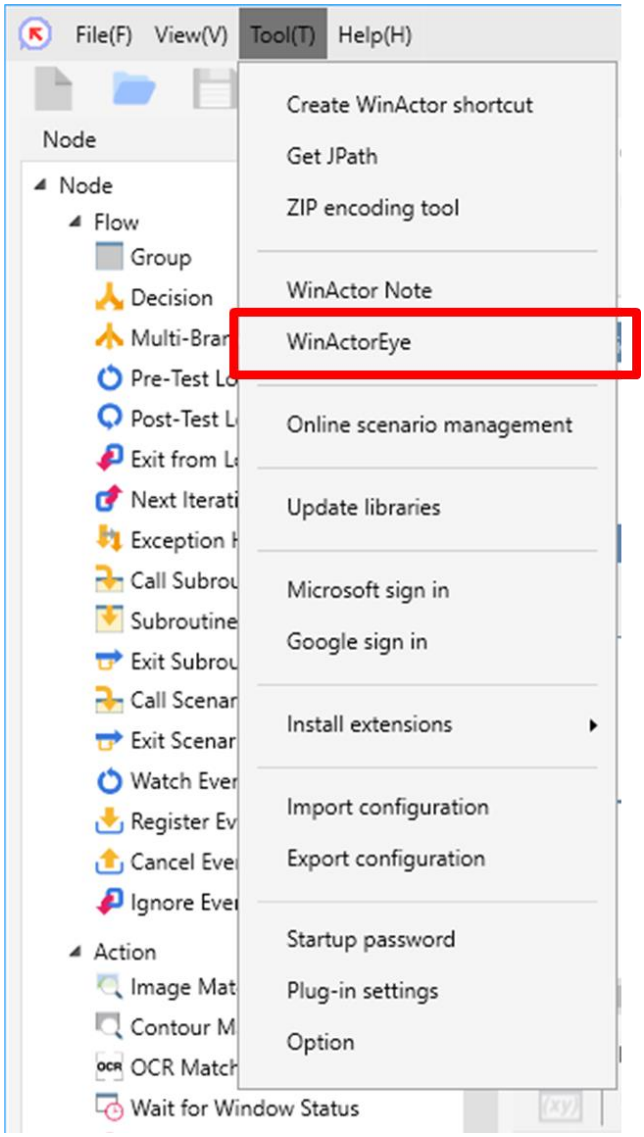


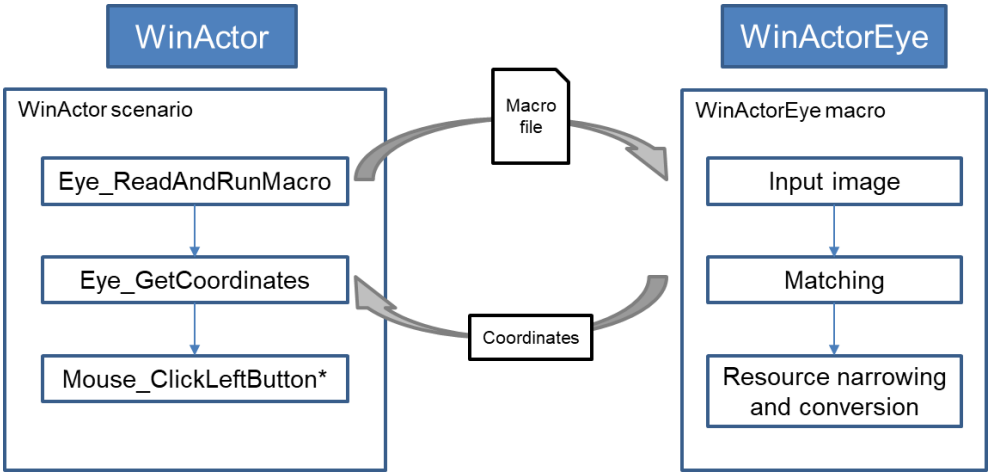
Figure 1-1. Launching WinActorEye

2 WinActorEye

2.1 About WinActorEye

WinActorEye is a tool to search for a target image and generate coordinate information by creating and running a WinActorEye macro that combines various search conditions.

The relationship between WinActorEye and WinActor is as follows.



* Mouse_ClickLeftButton is located under "12_Mouse" in the User Library.

Figure 2-1. Relationship diagram between WinActorEye and WinActor

By specifying and running a WinActorEye macro from the WinActor library, WinActorEye runs operations recorded in the macro. WinActor gets coordinate information from WinActorEye and performs operations such as mouse click by using existing nodes and libraries. For how to create a scenario using WinActorEye, see "WinActorEye Scenario Creation Manual."

Compared with the existing Image Matching and Contour Matching, WinActorEye has the following distinctions.

・Achieves strong matching against desktop size changes
・Adjustable while checking results when matching fails

2.2 Terms and descriptions

The terms commonly used in the description of WinActorEye are explained below. As an example, it is assumed here that you want to search for the "submit" button on the page where the WinActor sample file "Tutorial.html" is opened in Microsoft Edge (hereinafter, Tutorial page).

Table 2-1. List of terms and descriptions

No.	Term	Description
1	Reference base image	An image that contains a target to be searched. In Figure 2-2, it is the captured image of the Tutorial page.
2	Reference image	An image to be searched. In Figure 2-2, it is the image of the "submit" button cut out from the captured image of the Tutorial page.
3	Image resource	Image data such as PNG is input/output and managed as image information on WinActorEye. It is used to output various filters and image files. In Figure 2-3, the captured image of the Tutorial page is displayed as an image resource.
4	Rectangle resource	Rectangle information drawn as a rectangle on the main window of WinActorEye (see "3.1 Main window"). It holds the x-coordinate, y-coordinate, rectangle width and height, and angle information of the upper left vertex of the rectangle. It is used to specify a range or to check the matching result. In Figure 2-3, a red frame surrounding the "submit" button is displayed as a rectangle resource.
5	Coordinate resource	Coordinate information drawn in a circle on the main window of WinActorEye (see "3.1 Main window"). It holds the x-coordinate and y-coordinate information of the center of the circle. It is used when performing a mouse action in WinActor. In Figure 2-3, the coordinates of the center of the "submit" button are displayed with a red circle as a coordinate resource.
6	Color resource	Color information (RGBA) output by "Color picker tool." By specifying this as an input item of "Search specified color," it is possible to search by specifying a color.
7	Matching	It is to search an image resource for a part that matches a reference image or search target characteristics (color, shape, etc.).
8	Work folder	This is the starting point for running WinActorEye. Any folder can be set.

"Tutorial.html" is stored in the "WinActor_Documents\English\Tutorial" folder under the 'Installation folder' of WinActor or the "winactor_documents\English\Tutorial" folder under the 'User folder' of WinActor.

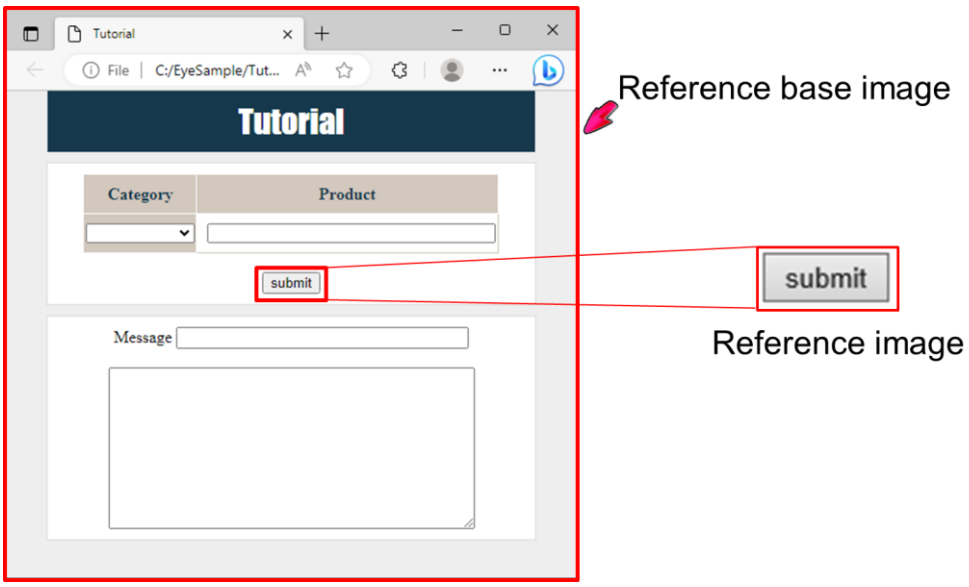


Figure 2-2. "Reference base image" and "Reference image"

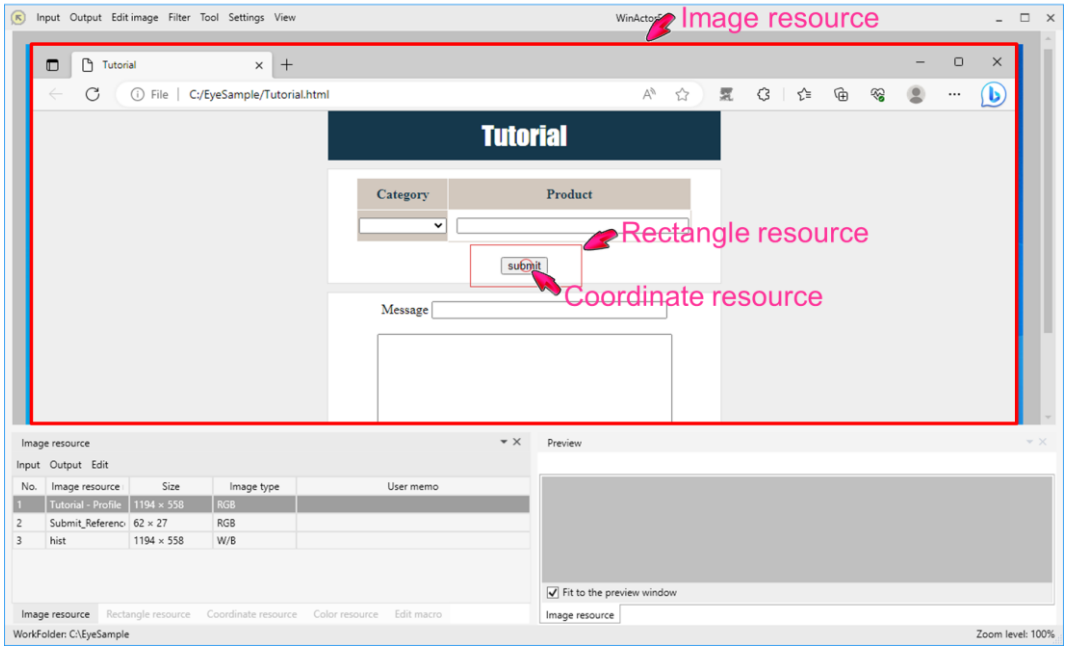


Figure 2-3. Resource illustration

2.3 Operation flow of WinActorEye

The processing flow is as follows. (For details, see each chapter.)

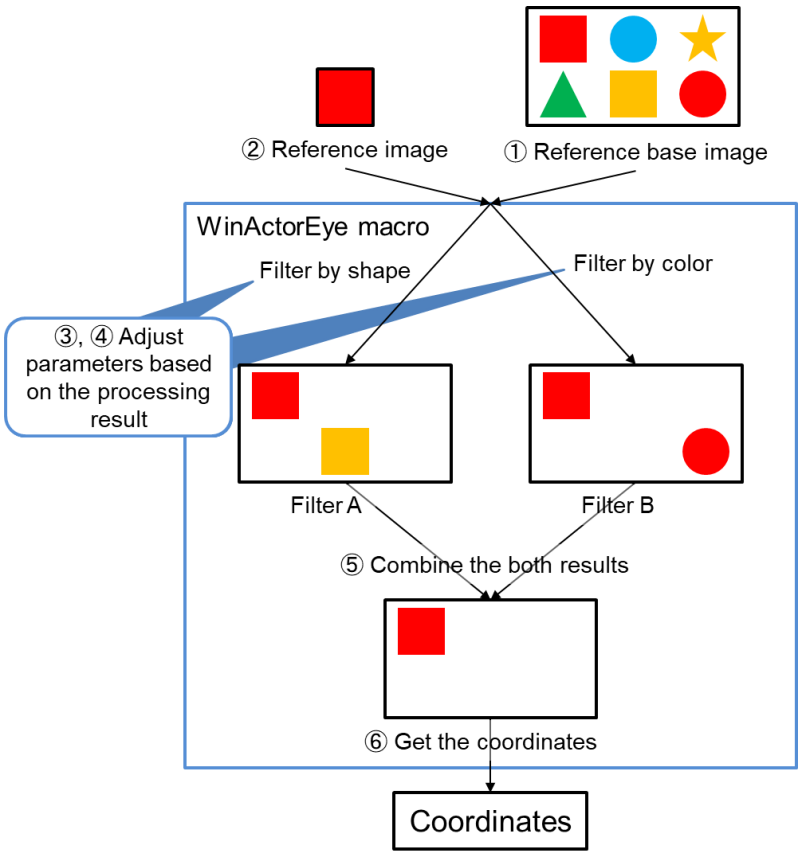


Figure 2-4. Operation flow image

① Specify a window or load an image file to get a reference base image. (See "4 Input")
② Specify a target range for image matching in the reference base image to get a reference image. (See "6 Edit image") *1, 2
③ As shown in the figure above, specify a processing according to characteristics (color, shape, etc.) of the target for matching. (See "7 Filter")
④ Adjust parameters based on the processing result of ③. *3
⑤ The candidate area can be narrowed down by multiplying multiple processing results. In the example in the above figure, only the candidate that is common to the results of Filter A and Filter B is narrowed down. (See "7.7 Boolean operation")
⑥ Convert rectangle information to coordinate information. By storing the extracted coordinate information in the variables of WinActor, the mouse action becomes possible. (See "7.9 Extract coordinates from rectangle")

*1. A reference image can also be acquired by loading an image file.
*2. Some images do not require a reference image depending on the filter used.
*3. Information acquired as a processing result would be an image resource, rectangle resource, coordinate resource, or color resource.

3 Main window

3.1 Main window

The main window is a window that appears when you launch WinActorEye.

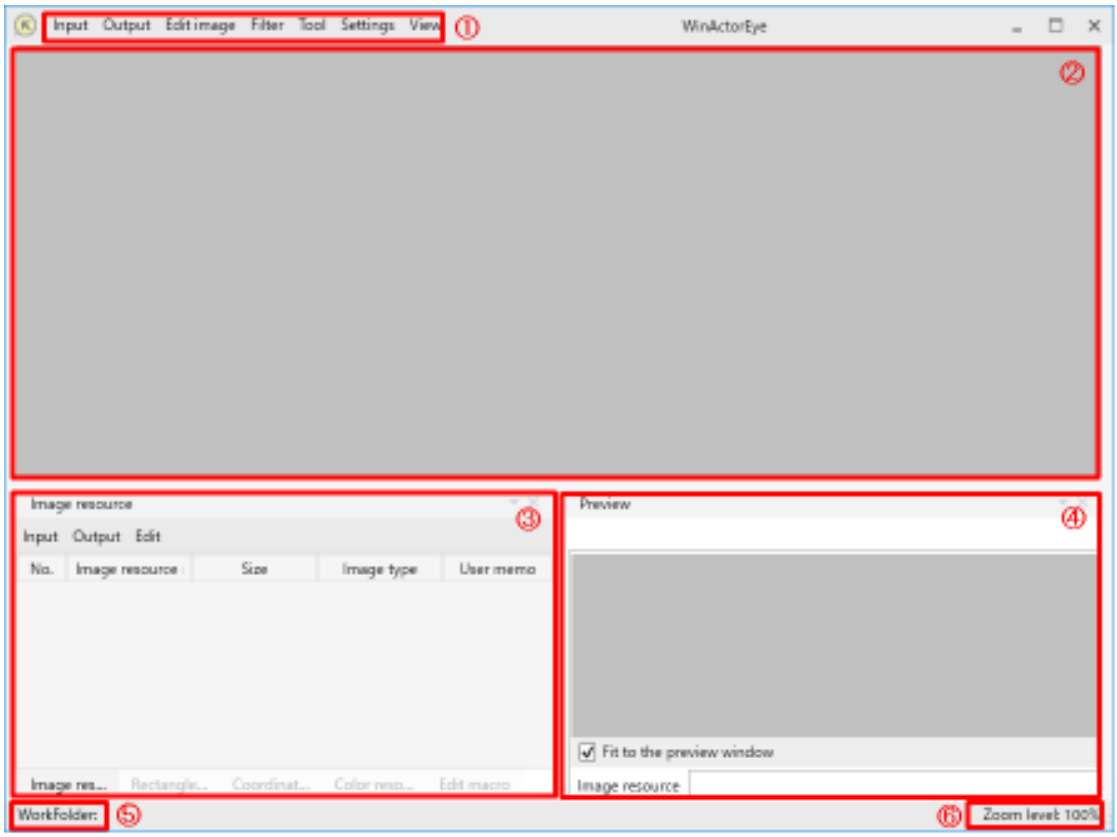


Figure 3-1. Main window

Table 3-1. Window elements

No.	Element	Description
①	Menu bar	Shows menus for executing each function.
②	Image input area	Accepts various resource displays and mouse operations.
③	Resource area	Shows various resource information.
④	Preview area	Shows the input resource of each function and its resource information.
⑤	WorkFolder	Shows a current work folder.
⑥	Zoom level	Shows the zoom level of the image input area.

3.2 Docking window

The docking window is a function that allows you to float the resource area, the property area, and the preview area for each menu item, and place them anywhere on the screen.

3.2.1 Dragging a title bar

You can change a position of the resource area, the property area, or the preview area for each menu item by dragging their title bar with the mouse to float the area and dropping it to your desired position.

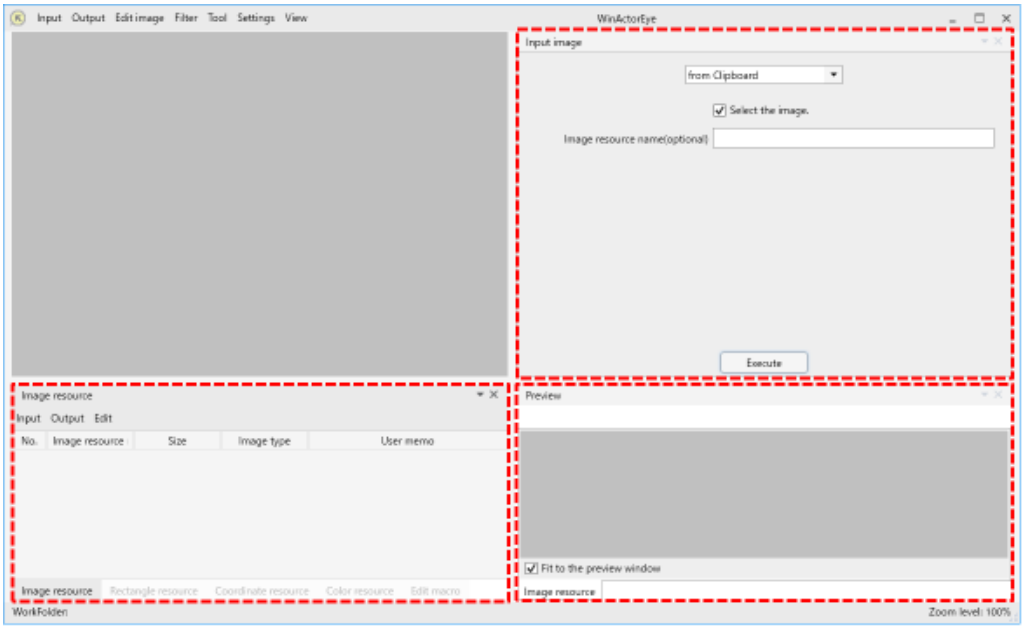


Figure 3-2. Dragging the title bar ①

For example, you can change the position of the property area by dragging and dropping its title bar.

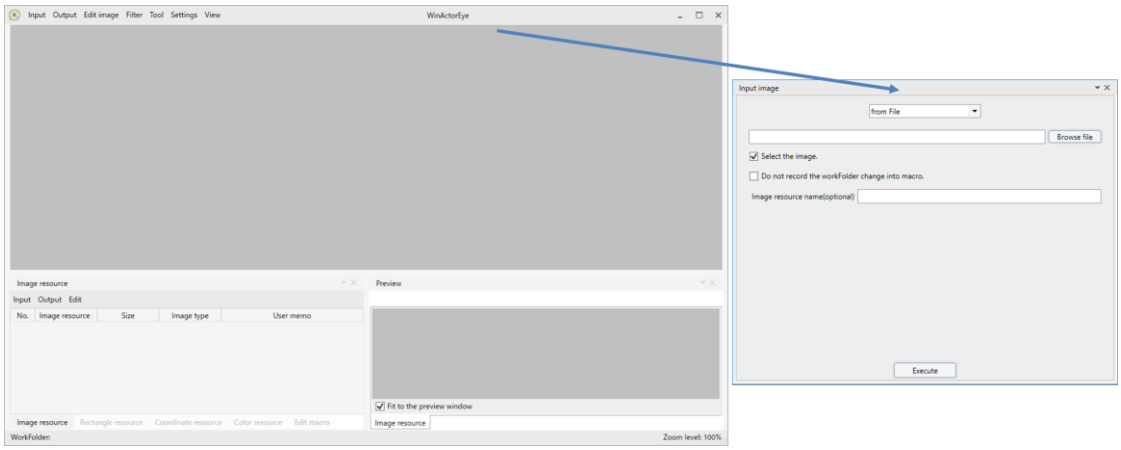


Figure 3-3. Dragging the title bar ②

3.2.2 Dragging a tab

You can change a position of the resource area, the property area, or the preview area for each menu item by dragging its tab with the mouse to float the area and dropping it to your desired position.

For example, you can change the position of the "Snapshot" property area by dragging and dropping its tab.

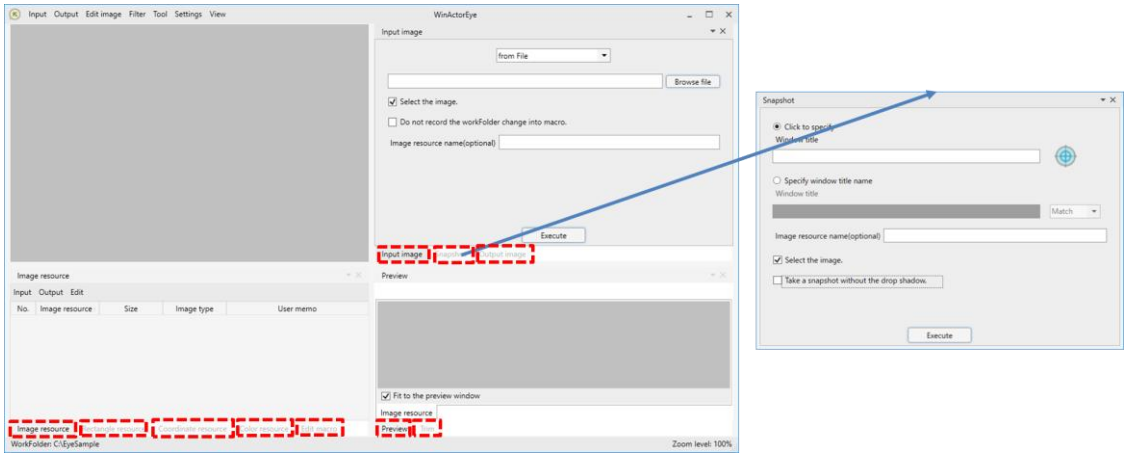


Figure 3-4. Dragging the tab

3.2.3 Docking (entire window area)

You can place (dock) a floating window inside WinActorEye by dragging and dropping it onto WinActorEye.

Drag a floating window onto WinActorEye. The control appears on the four sides of WinActorEye.

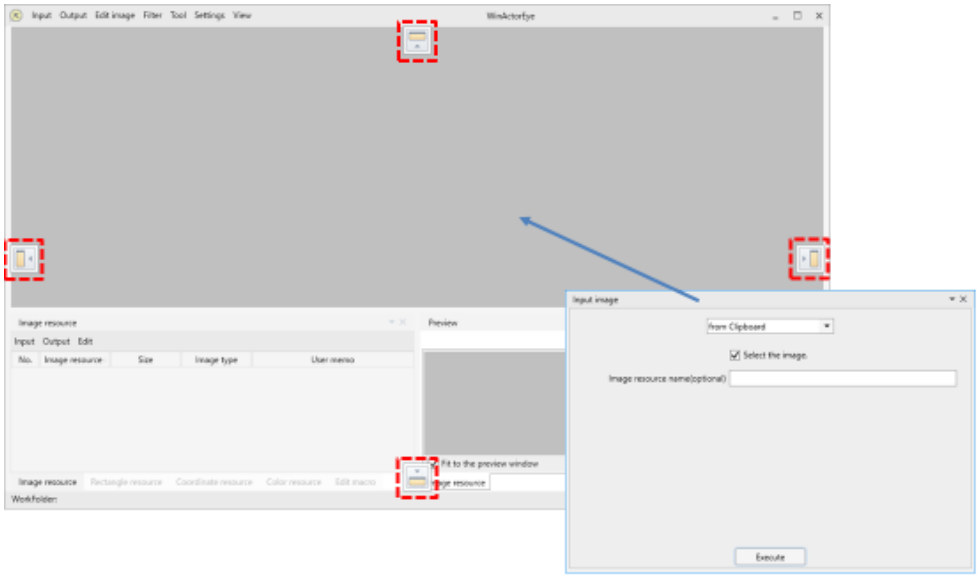


Figure 3-5. Docking (entire window area) ①

Overlay the floating window on the control. The docking position will be displayed in a blue frame.

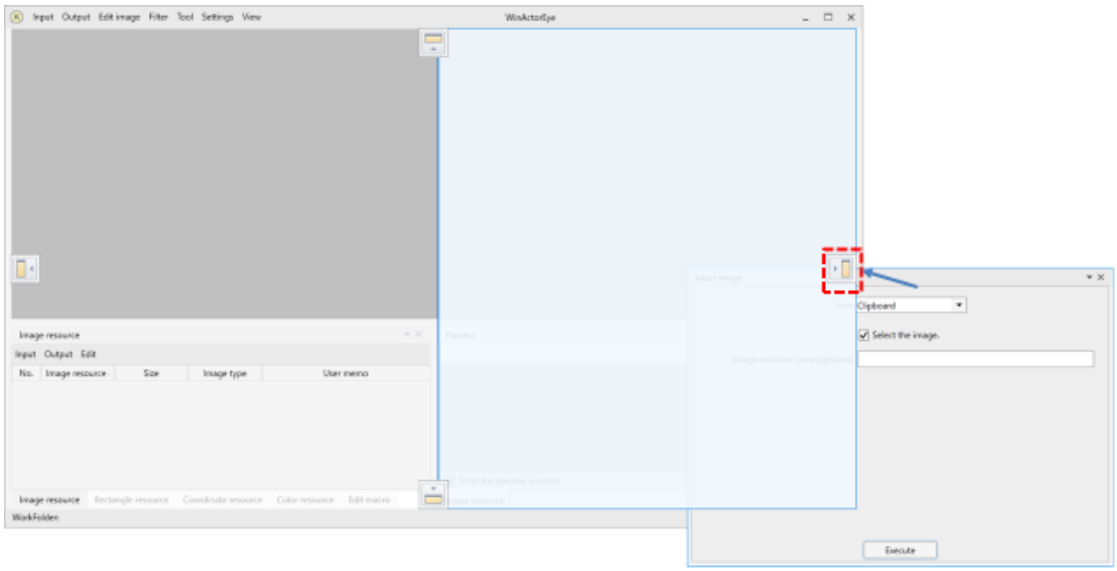


Figure 3-6. Docking (entire window area) ②

Drop the window to dock it at the position of the blue frame.

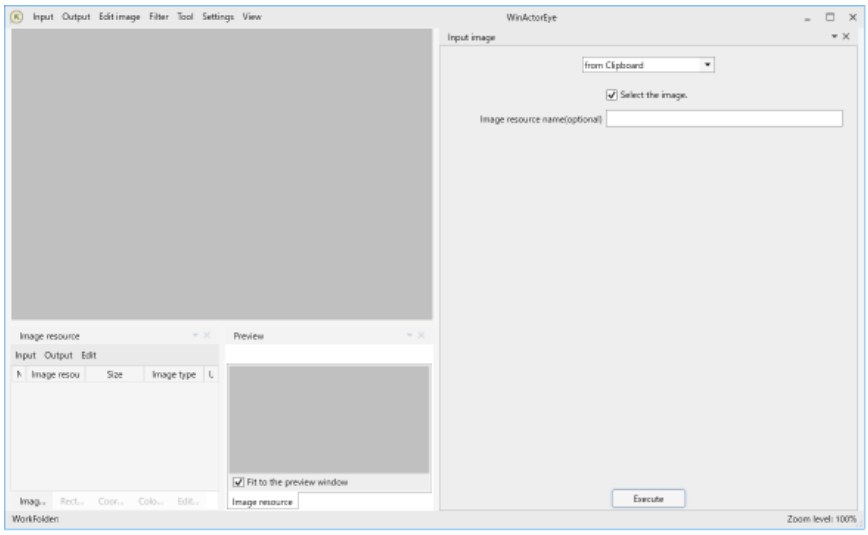


Figure 3-7. Docking (entire window area) ③

3.2.4 Docking (resource/property/preview area)

You can dock a floating window or place it as a tab by dragging and dropping it to the resource area, the property area, or the preview area for each menu item.

Drag a floating window to the resource area, the property area, or the preview area for each menu item. The control appears on the center of the area.

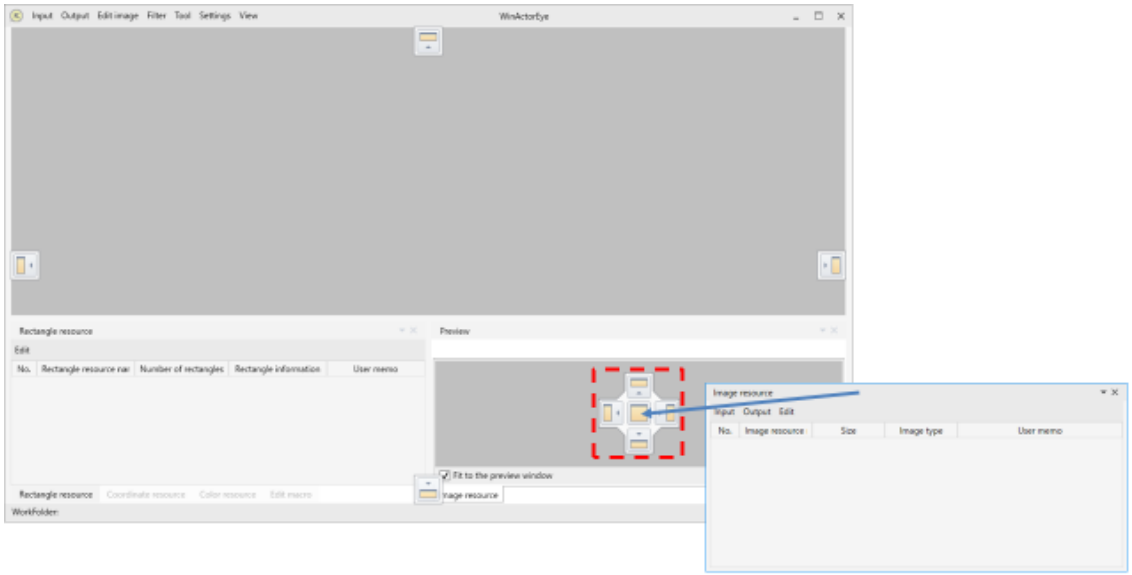


Figure 3-8. Docking (resource/property/preview area) ①

Drop the floating window to the right, left, top, or bottom of the control.

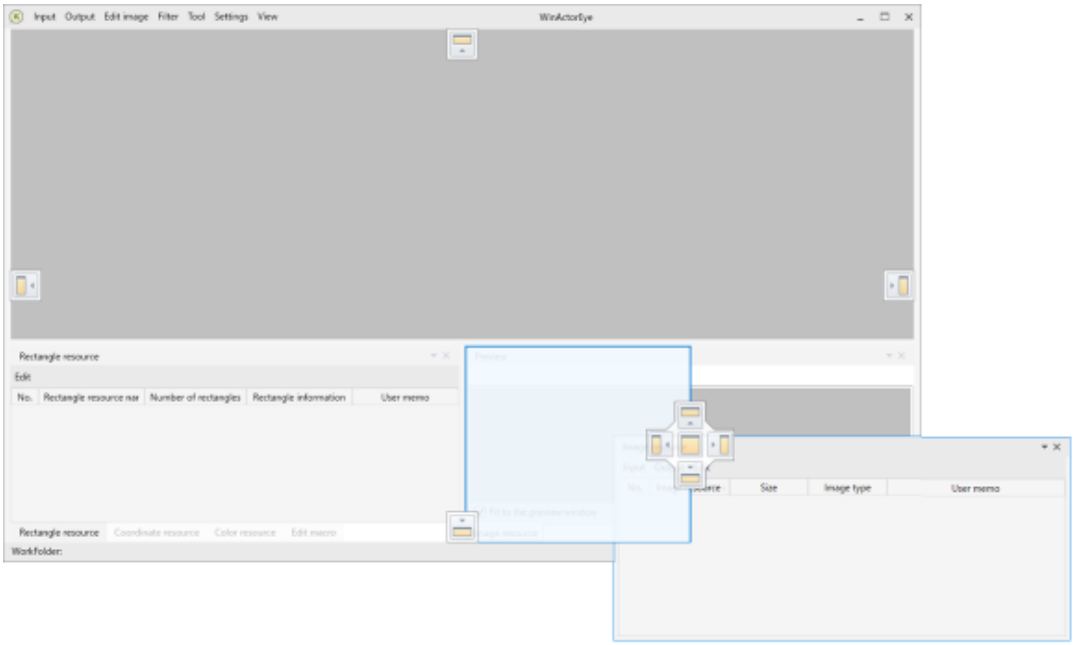


Figure 3-9. Docking (resource/property/preview area) ②

The window will be docked in the corresponding position (right, left, top, or bottom) of the area.

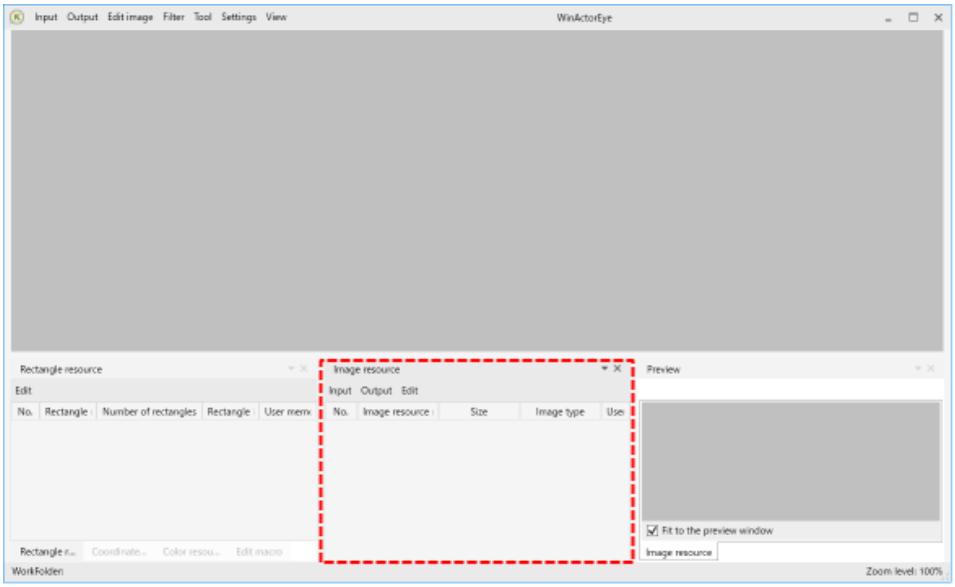


Figure 3-10. Docking (resource/property/preview area) ③

Drop the floating window to the center of the control.

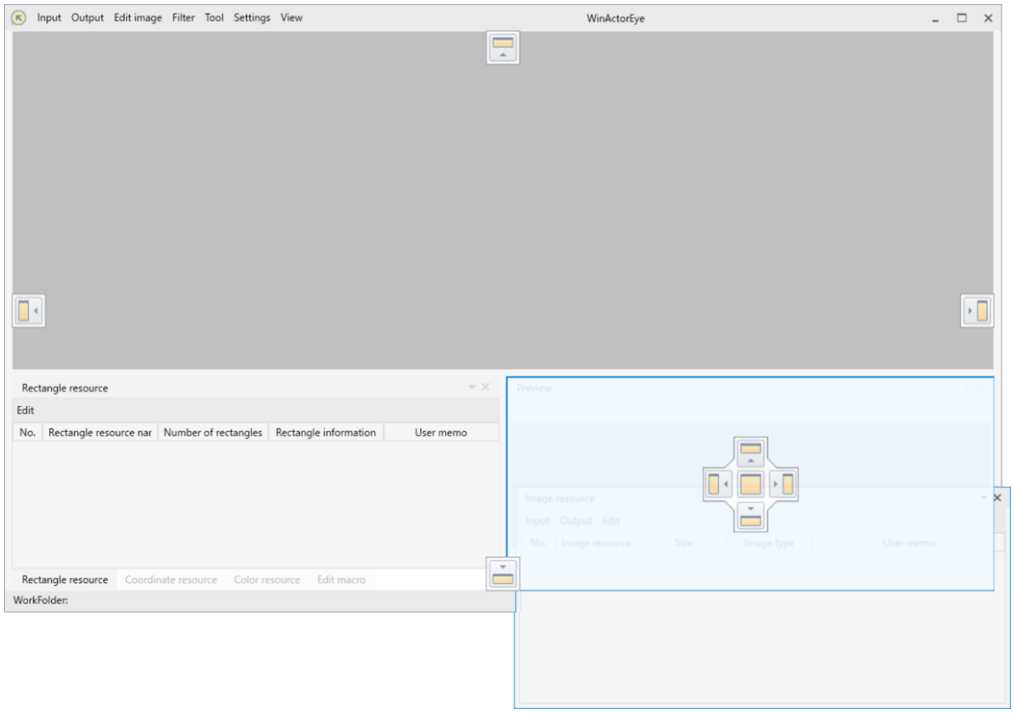


Figure 3-11. Docking (tabbed) ①

The window will be docked as a tab.

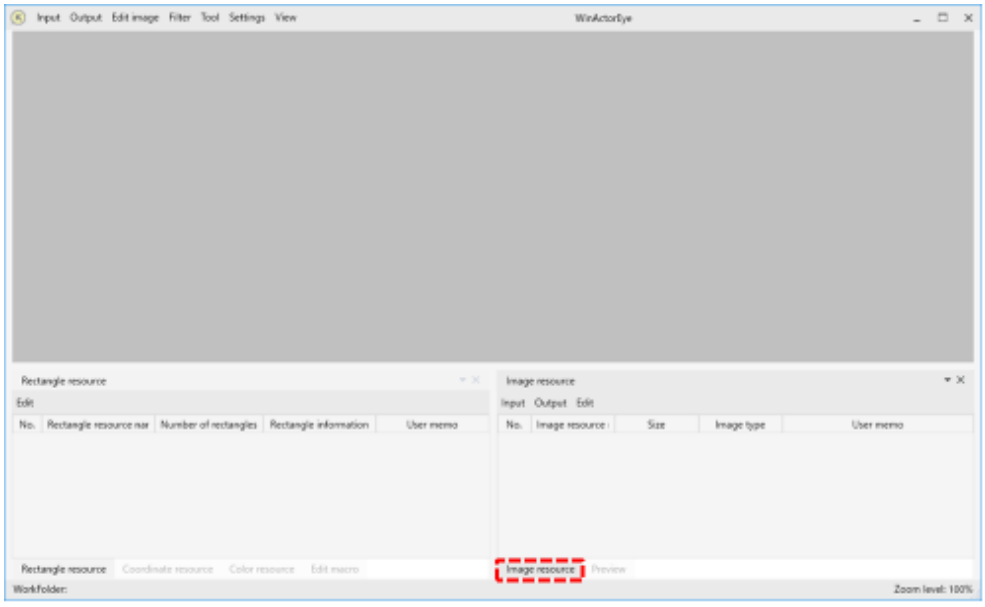


Figure 3-12. Docking (tabbed) ②

3.2.5 Float/Dock menu

Click ▼ in the upper right of the resource area, the property area, or the preview

area for each menu item to display the menu. Select "Float" in the displayed menu to float the selected tab.

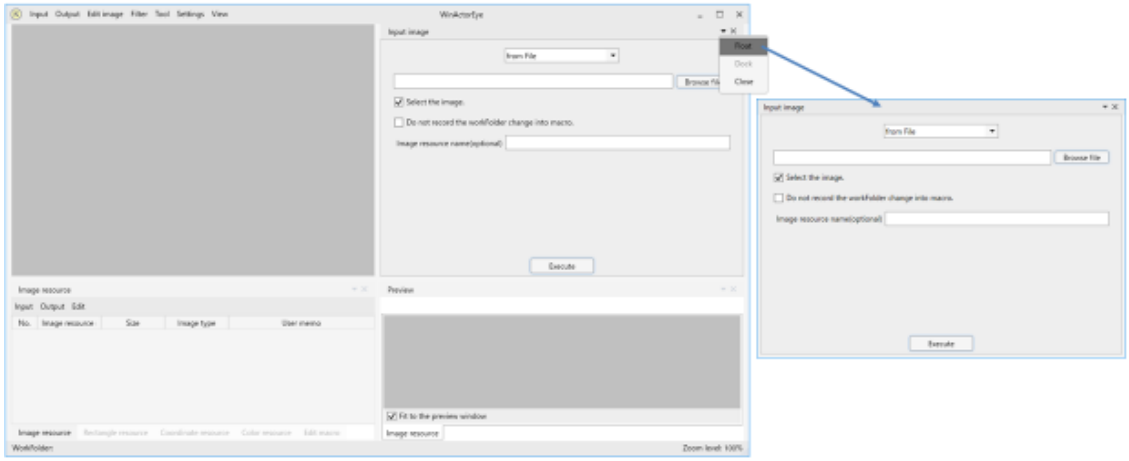


Figure 3-13. Float/Dock menu

Select "Dock" in ▼ in the upper right of the floating window to dock it in its original position.

Select "Close" in ▼ or click ‘×’ in the upper right of the window to close the selected tab.

3.2.6 Saving and restoring the layout

The layout is automatically saved and restored when you quit and launch WinActorEye.

- When quitting WinActorEye: The current layout will be saved.
- When launching WinActorEye: The saved layout will be restored. If the layout has never been saved, the default layout will be restored.

You can also save and restore the layout from the "View" menu of the menu bar.

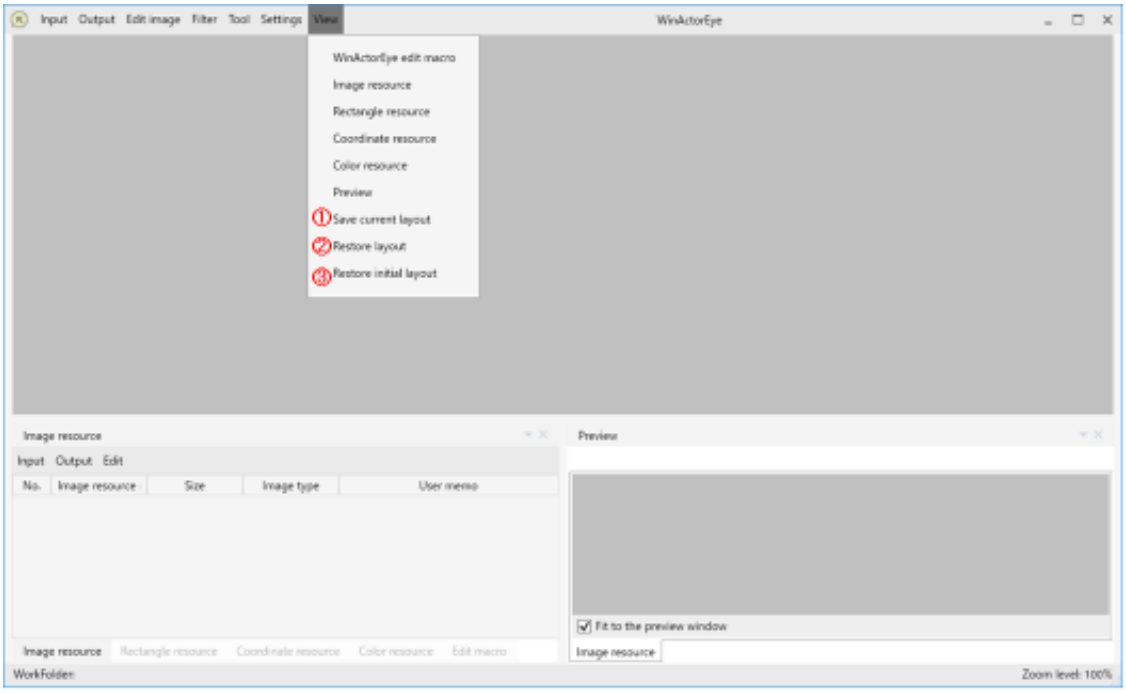


Figure 3-14. Saving and restoring the layout

Table 3-2. Saving and restoring the layout

No.	Menu	Description
①	Save current layout	Saves the current layout
②	Restore layout	Restores the saved layout.
③	Restore initial layout	Restores the default layout.

3.3 Operations in the image input area

The operations that can be performed in the image input area are as follows.

Table 3-3. List of operations in the image input area

No.	Operation	Description
1	Registering an image resource	Drag and drop an image file into the image input area. For details, see "3.3.1 Registering an image resource."
2	Creating a rectangle resource	Drag the mouse over an image resource displayed in the image input area. For details, see "3.3.2 Registering a rectangle resource."
3	Creating a coordinate resource	Click on an image resource displayed in the image input area. For details, see "3.3.3 Registering a coordinate resource."
4	Editing/viewing a rectangle resource	With one or more rectangle resources registered, right-click on an image resource displayed in the image input area. For details, see "3.3.4 Editing/viewing a rectangle resource."
5	Editing/viewing a coordinate resource	With one or more coordinate resources registered, right-click on an image resource displayed in the image input area. For details, see "3.3.5 Editing/viewing a coordinate resource."

3.3.1 Registering an image resource

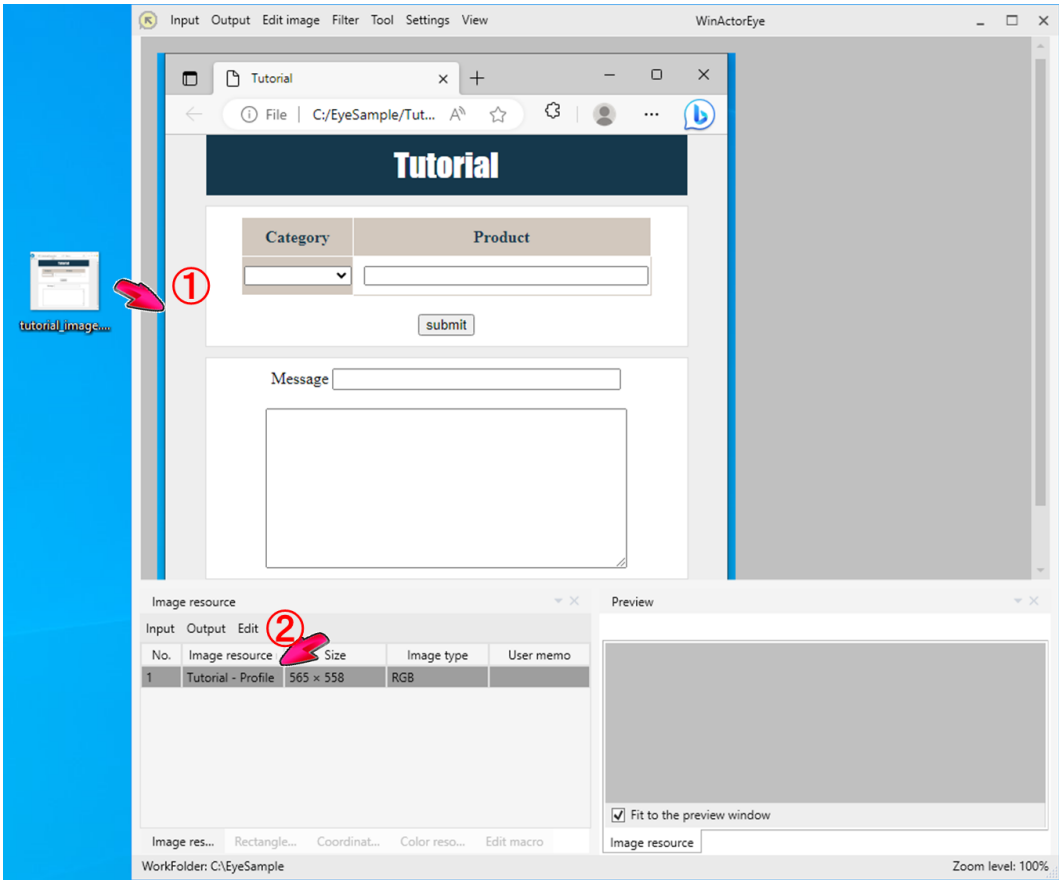


Figure 3-15. Registering an image resource on the image input area

You can register an image resource by dragging and dropping an image file into the image input area (① in Figure 3-15). The filename of the dragged and dropped image will be registered as the image resource name, and it will be in the selected state (displayed on the main window) (② in Figure 3-15).

For other methods of registering an image resource, see "4 Input."

The "Image resource" pane is displayed in the resource area.

The "Image resource" pane can also be displayed by clicking "Image resource" in the "View" menu. For the "Image resource" pane, see "10.3 Image resource."

3.3.2 Registering a rectangle resource

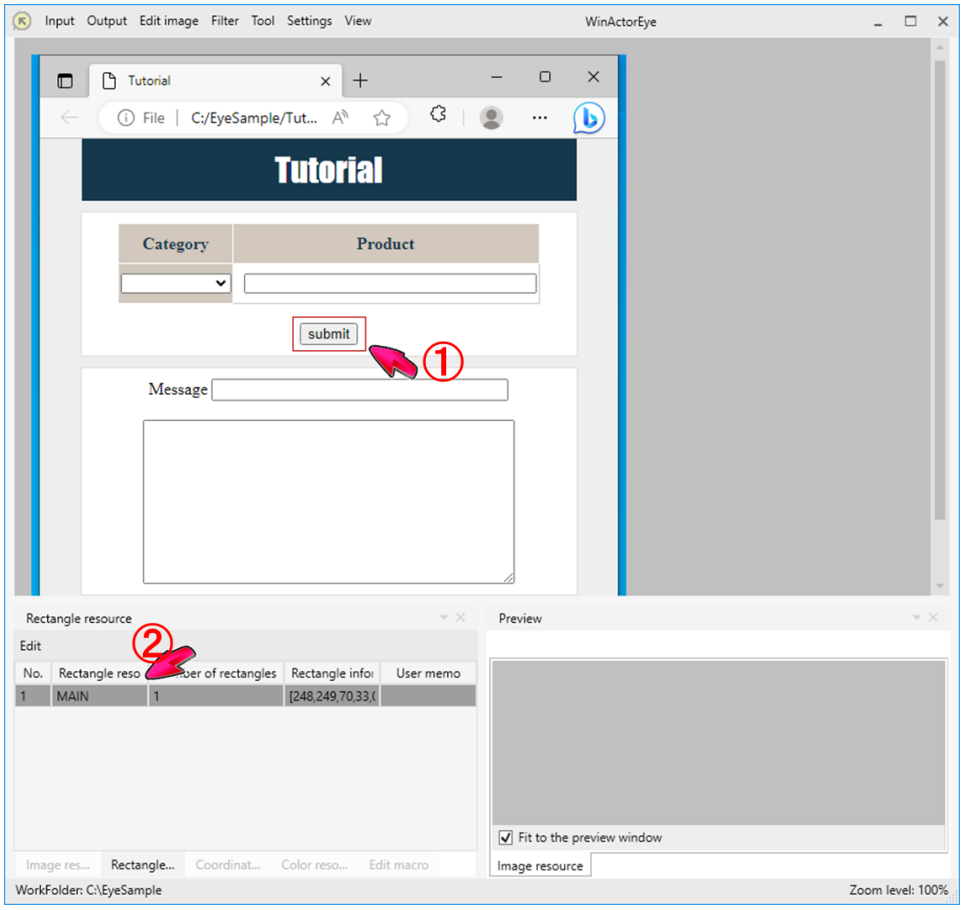


Figure 3-16. Registering a rectangle resource on the image input area

You can register a rectangle resource by dragging the mouse over a target and specifying its range on an image resource displayed in the image input area (① in Figure 3-16). The rectangle information created by dragging will be registered in the rectangle resource named "MAIN" (② in Figure 3-16). You can update the rectangle information of "MAIN" by dragging again. You can also register information of multiple rectangles in "MAIN" by dragging while holding down the ‘Ctrl’ key.

The "Rectangle resource" pane can be displayed by selecting its tab in the resource area or by clicking "Rectangle resource" in the "View" menu. For the "Rectangle resource" pane, see "10.4 Rectangle resource."

3.3.3 Registering a coordinate resource

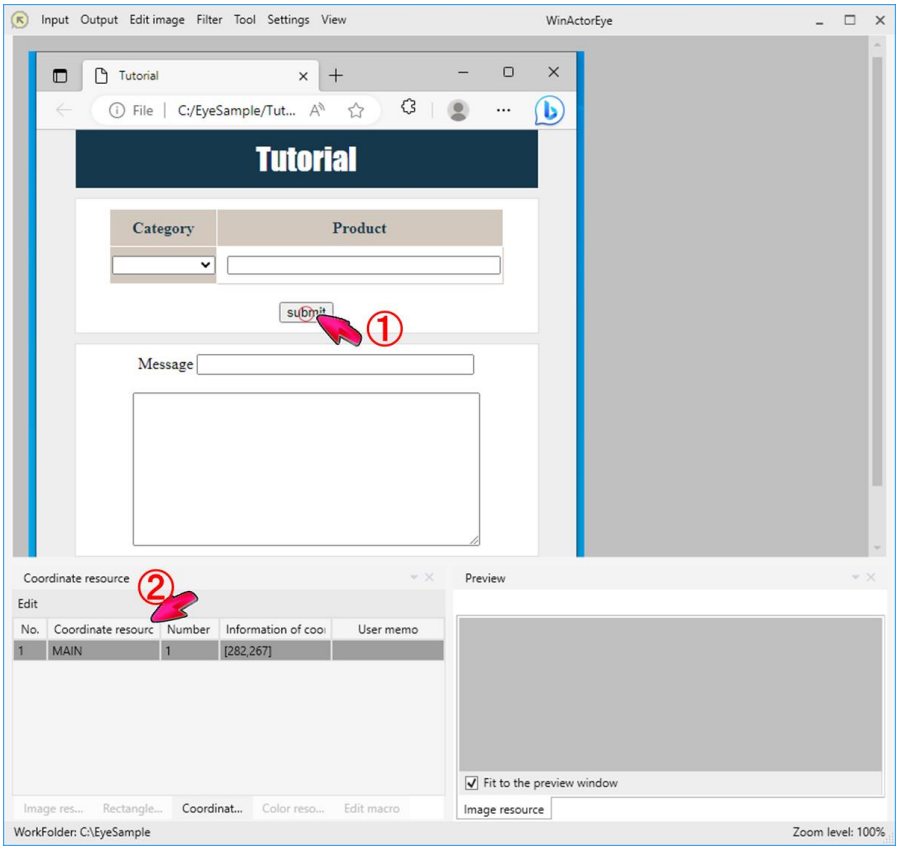


Figure 3-17. Registering a coordinate resource on the image input area

You can register a coordinate resource by clicking a target on an image resource displayed in the image input area (① in Figure 3-17). The coordinate information created by clicking will be registered in the coordinate resource named "MAIN" (② in Figure 3-17). You can update the coordinate information of "MAIN" by clicking again. You can also register information of multiple coordinates in "MAIN" by clicking while holding down the ‘Ctrl’ key.

The "Coordinate resource" pane can be displayed by selecting its tab in the resource area or by clicking "Coordinate resource" in the "View" menu. For the "Coordinate resource" pane, see "10.5 Coordinate resource."

3.3.4 Editing/viewing a rectangle resource

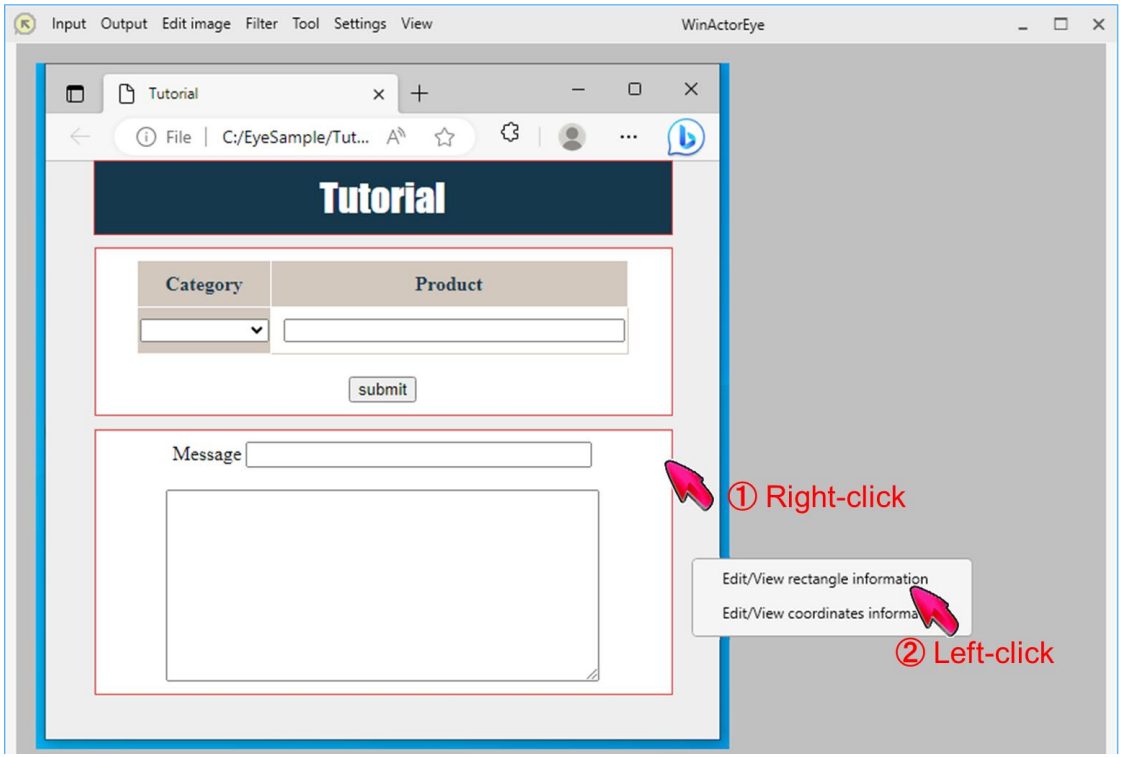


Figure 3-18. Editing a rectangle resource on the image input area

With one or more rectangle resources registered, right-click on an image resource to display the menu (Figure 3-18).

Click "Edit/View rectangle information" in the displayed menu to open the "Edit/View rectangle information" window (Figure 3-19).

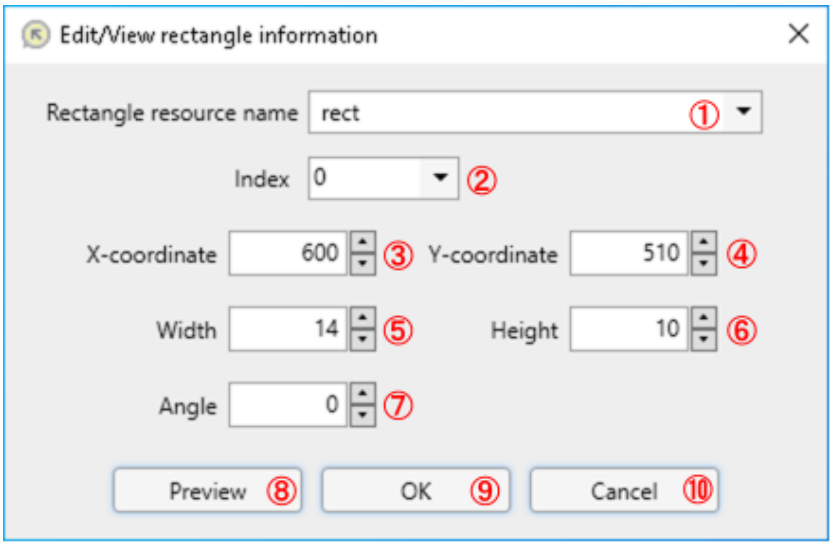


Figure 3-19. "Edit/View rectangle information" window

In the "Edit/View rectangle information" window, you can edit the rectangle information of the rectangle resource for each parameter. The rectangle information of the selected "Index" is displayed as a thick red line on the image input area (Figure 3-20).

Table 3-4. "Edit/View rectangle information" window elements

No.	Element	Description
①	Rectangle resource name	You can select the name of the rectangle resource to edit. If nothing or 'Selected resource' is selected for this element, the resource selected on the "Rectangle resource" pane is the target to edit.
②	Index	You can select the rectangle information for editing.
③	X-coordinate	You can edit the x-coordinate of the upper left of the rectangle.
④	Y-coordinate	You can edit the y-coordinate of the upper left of the rectangle.
⑤	Width	You can edit the width of the rectangle.
⑥	Height	You can edit the height of the rectangle.
⑦	Angle	You can edit the angle of the rectangle.
⑧	Preview	Updates the display of the red frame in the image input area temporarily based on the values of No.3 to 7. This allows you to check the position of the rectangle after editing.
⑨	OK	Confirms your edit.
⑩	Cancel	Cancels your edit.

"Index" cannot be edited if the value for "Rectangle resource name" meets any of the following conditions.

- The selected resource contains no rectangle information.
- The entered resource name does not exist.
- Nothing or 'Selected resource' is selected for the element, and no resource or the resource that contains no rectangle information is selected on the "Rectangle resource" pane.

"X-coordinate," "Y-coordinate," "Width," "Height," "Angle," and "Preview" cannot be edited nor clicked if "Rectangle resource name" meets any of the following conditions.

- "MAIN" is selected.
- The selected resource contains no rectangle information.

- The entered resource name does not exist.
- Nothing or ‘Selected resource’ is selected for the entry, and no resource, “MAIN,” or the resource that contains no rectangle information is selected on the “Rectangle resource” pane.

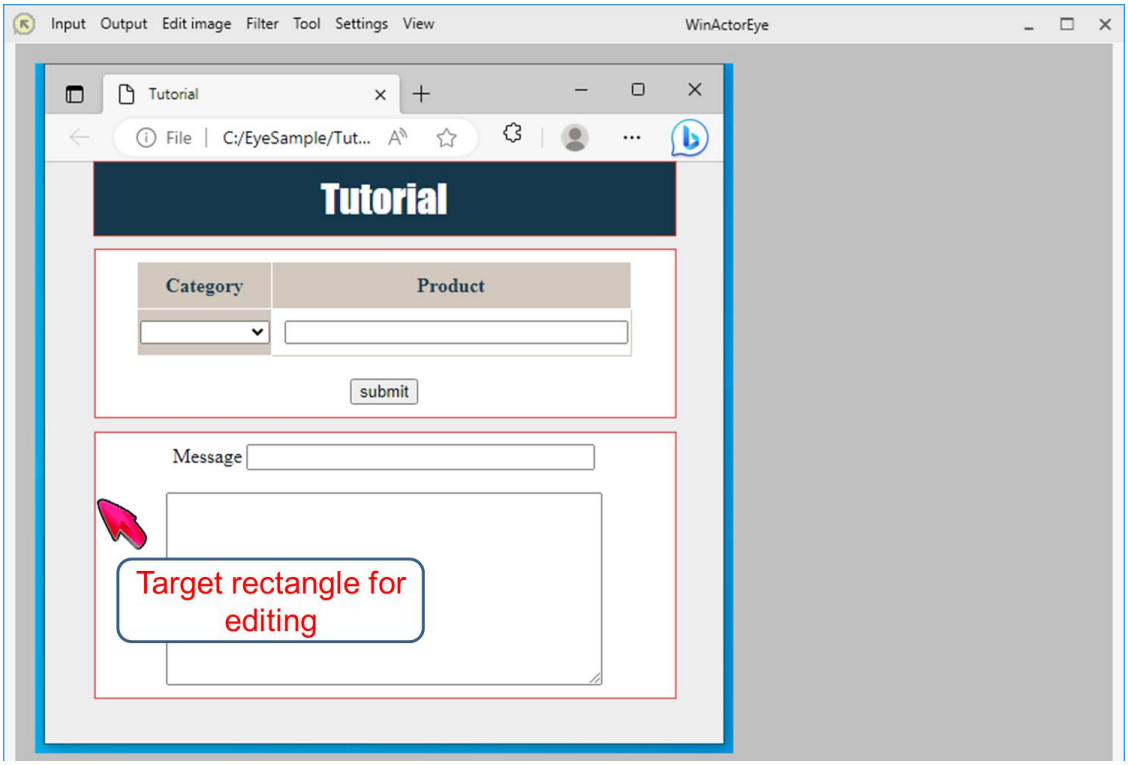


Figure 3-20. Image input area showing the target for editing

3.3.5 Editing/viewing a coordinate resource

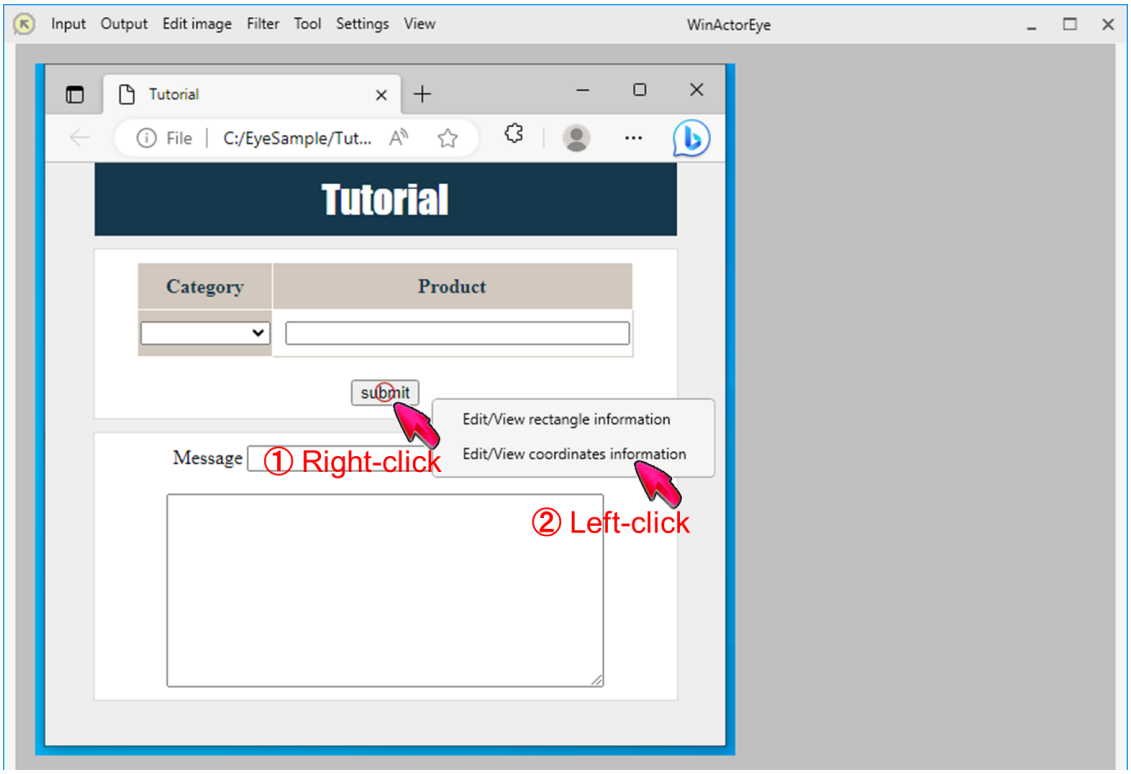


Figure 3-21. Editing a coordinate resource on the image input area

With one or more coordinate resources registered, right-click on an image resource to display the menu (Figure 3-21).

Click "Edit/View coordinates information" in the displayed menu to open the "Edit/View coordinates information" window (Figure 3-22).

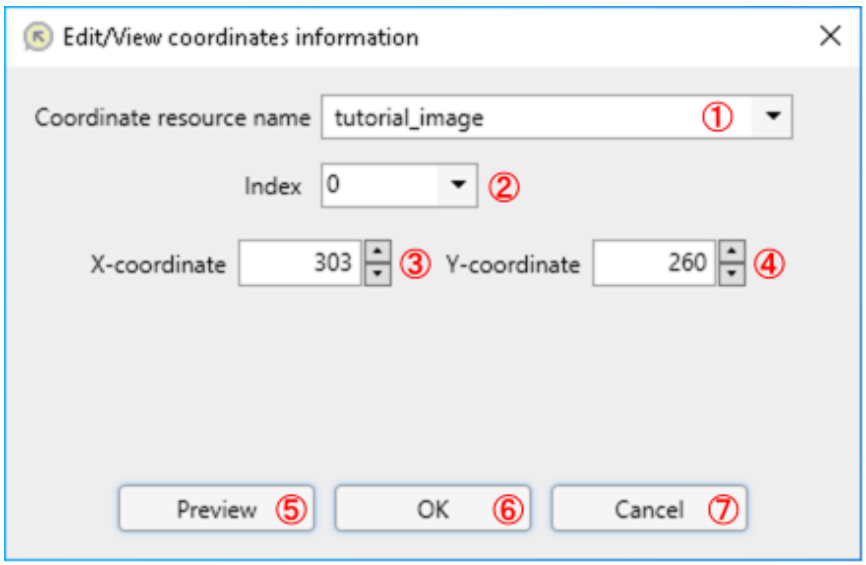


Figure 3-22. "Edit/View coordinates information" window

In the "Edit/View coordinates information" window, you can edit the coordinates information of the coordinate resource for each parameter. The coordinates information of the selected "Index" is displayed as a thick red line on the image input area (Figure 3-23).

Table 3-5. "Edit/View coordinates information" window elements

No.	Element	Description
①	Coordinate resource name	You can select the name of the coordinate resource for editing. If nothing or 'Selected resource' is selected for this element, the resource selected on the "Coordinate resource" pane is the target to edit
②	Index	You can select the rectangle information for editing.
③	X-coordinate	You can edit the x-coordinate.
④	Y-coordinate	You can edit the y-coordinate.
⑤	Preview	Updates the display of the red circle in the image input area temporarily based on the values of No.3 and 4. This allows you to check the position of the coordinates after editing.
⑥	OK	Confirms your edit.
⑦	Cancel	Cancels your edit.

"Index" cannot be edited if the value for "Coordinate resource name" meets any of the following conditions.

- The selected resource contains no coordinates information.

- The entered resource name does not exist.
- Nothing or ‘Selected resource’ is selected for the element, and no resource or the resource that contains no coordinates information is selected on the “Coordinate resource” pane.

“X-coordinate,” “Y-coordinate,” and “Preview” cannot be edited nor clicked if “Coordinate resource name” meets any of the following conditions.

- “MAIN” is selected.
- The selected resource contains no coordinates information.
- The entered resource name does not exist.
- Nothing or ‘Selected resource’ is selected for the entry, and no resource, “MAIN,” or the resource that contains no coordinates information is selected on the “Coordinate resource” pane.

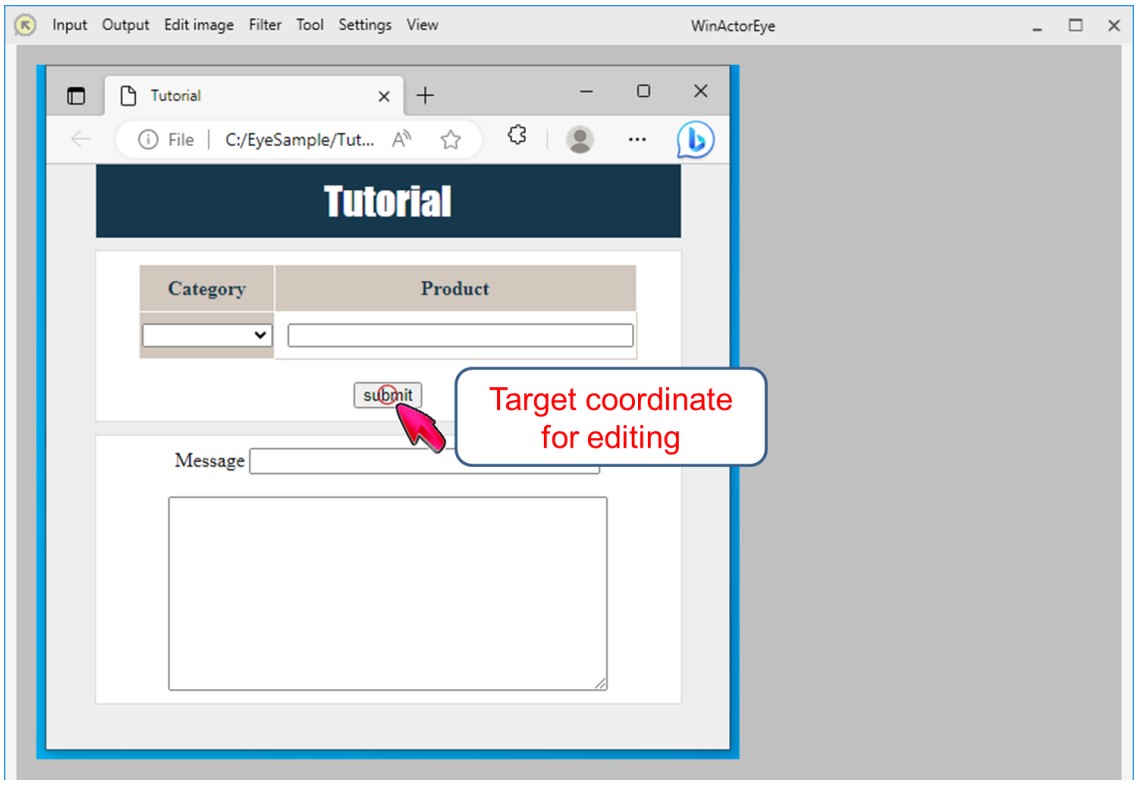


Figure 3-23. Image input area showing the target for editing

3.3.6 Changing the zoom level

After registering an image resource, you can change the zoom level of the image input area by clicking the image input area and then scrolling the mouse wheel while holding down the ‘Ctrl’ key.

You can also increase the zoom level by pressing the ‘+’ key while holding down the ‘Ctrl’ key, and decrease the zoom level by pressing the ‘-‘ key while holding down the ‘Ctrl’ key.

4 Input

4.1 Input menu

The Input menu has functions for inputting image data from a file, the clipboard, or by a snapshot. You can register the input image information as an image resource and display the image in the image input area of WinActorEye.

Click "Input" on the menu bar to display its functions as shown in "Figure 4-1. Input menu" below.

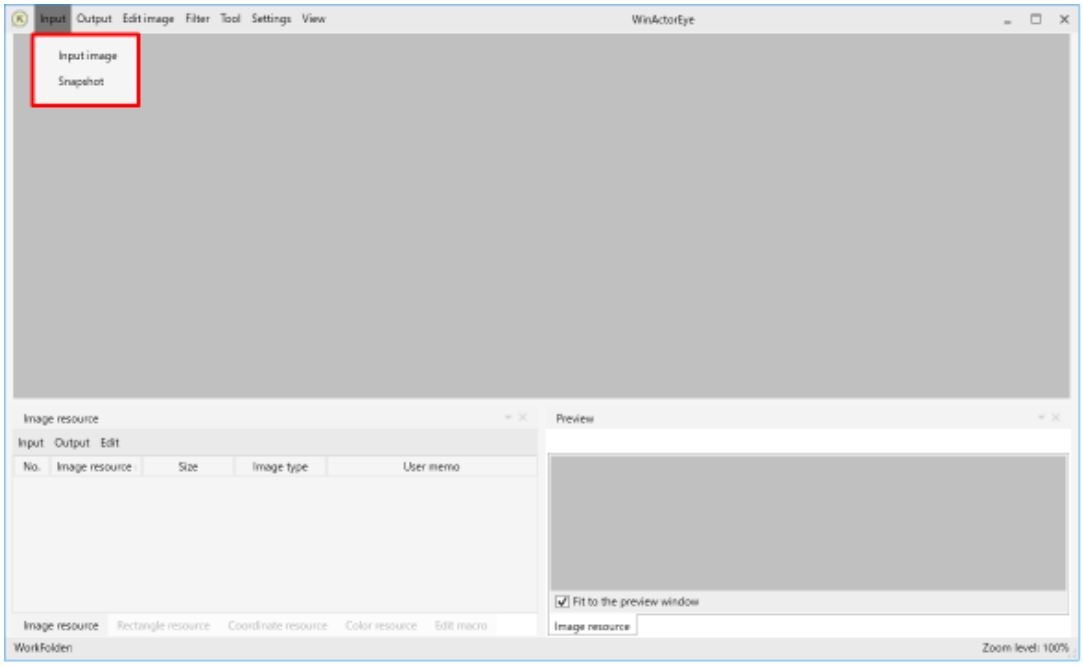


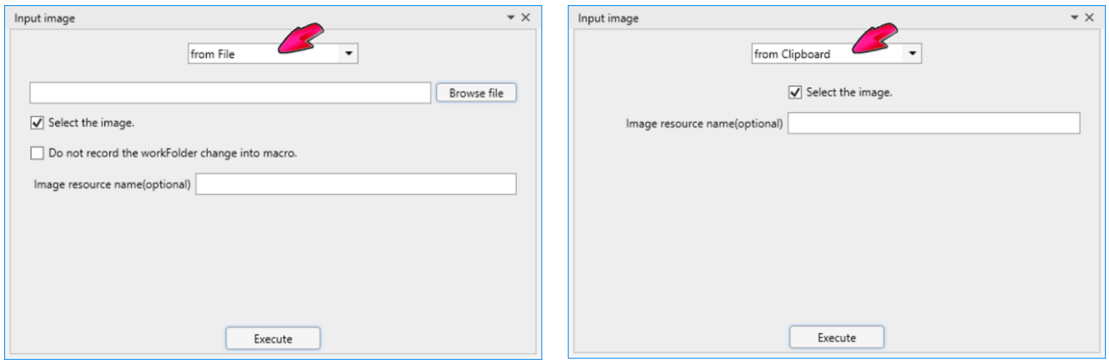
Figure 4-1. Input menu

Table 4-1. Input menu

No.	Function	Description
1	Input image	Displays the "Input image" window. For details, see "4.2 Input image."
2	Snapshot	Displays the "Snapshot" window. For details, see "4.3 Snapshot."

4.2 Input image

"Input image" is a function to input image data from a file or the clipboard.



When "from File" is selected When "from Clipboard" is selected

Figure 4-2. "Input image" window

4.2.1 from File

"Figure 4-3. "Input image" window (from File)" shows a window to be displayed when you select "from File" as a method of inputting image data in the Input image window.

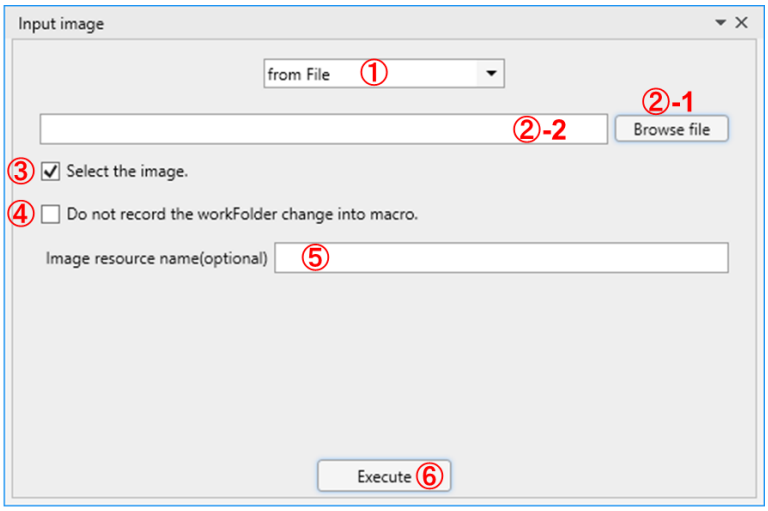


Figure 4-3. "Input image" window (from File)

The operation procedure to input image data from a file is as follows.

① Select "from File" as a method of inputting image data.

② Click the "Browse file" button (②-1) and specify where to reference a file. The file path name of the referenced location will be automatically entered in the file path field (②-2). You can also manually edit the text in the file path field (②-2).

③ Check the box to set the input image to the selected state.

④ Check the box to not record the work folder change when recording a macro. When unchecked (set to record), a macro that changes the work folder to the reference destination specified in ②-2 will be automatically generated. If you do not want to change the work folder, check the box (set to not record).

⑤ Specify an image resource name. It can be omitted. If omitted, the image file name specified in the file path field (②-2) will be the image resource name.

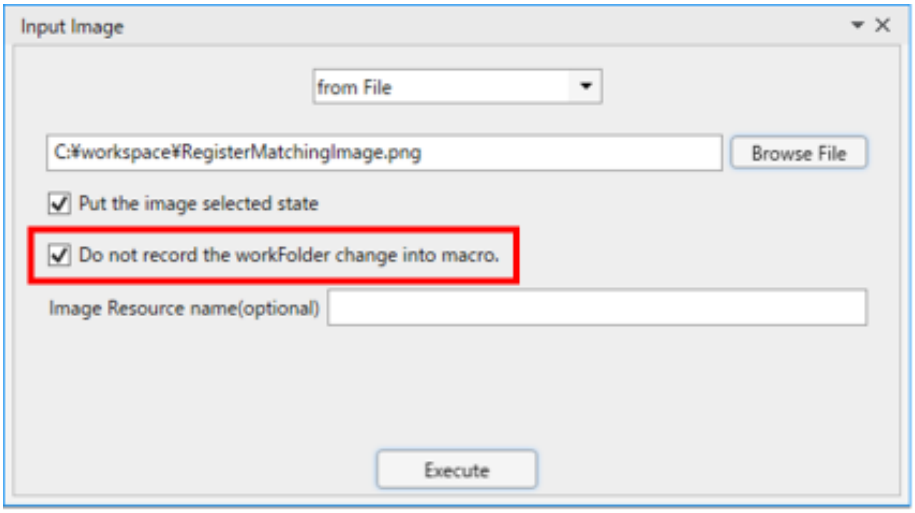
⑥ Click the button to input the image data based on the settings made in ① to ⑤.
If "Select the image" is checked in ③, the input image will be displayed in the image input area.
Image information will be registered or updated as an image resource. If the specified resource name already exists, the image information of the image resource will be overwritten and updated.
If the resource name does not exist, it will be newly registered.

“Do not record the work-folder change into macro.” is complemented below.

File input/output functions such as ‘Input tool’ of WinActor Note and ‘Input image’ of WinActorEye have the setting “Do not record the work-folder change into macro.”

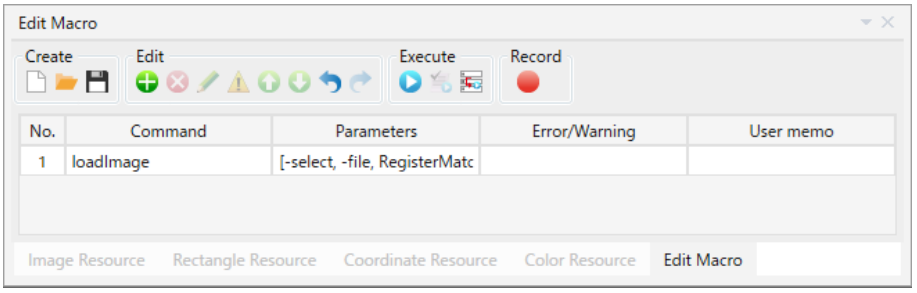
This setting specifies whether a movement of work folder is recorded in the macro created with the macro recording.

An example of ‘Input image’ of WinActorEye is described below.



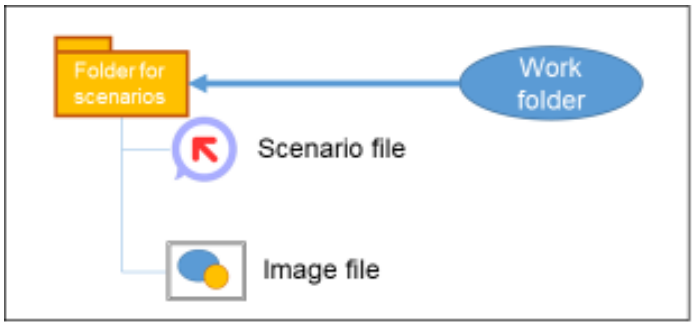
- [Checked] Do not record the work folder change into macro.

  The recorded macro does not have the row of changing the work folder.



As the default work folder is the folder for saving scenarios, the image files input to WinActorEye are supposed to be stored in the folder.

Storing scenarios file and their accompanying files in a folder, you can easily copy them by just copying the folder to another computer, and use them without correcting the file paths specified in the macros in them.



- [Not checked] Do record the work folder change into macro.

  The recorded macro has the row of changing the work folder.

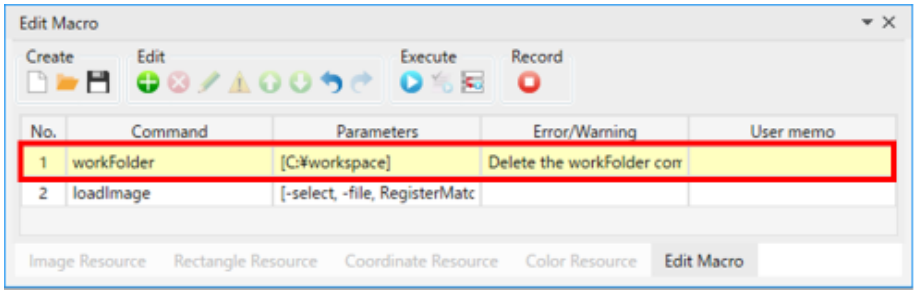
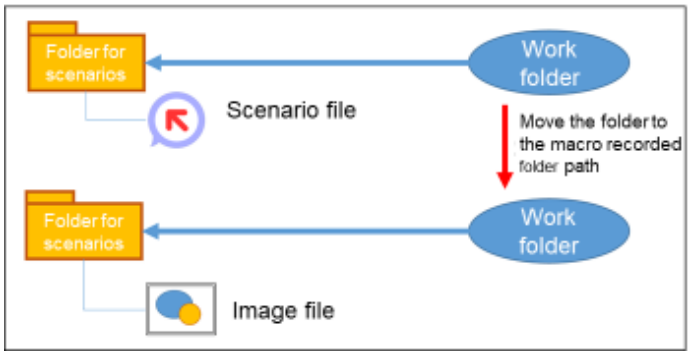


  Image files are supposed to be gathered in the folder different from the folder for saving scenario files.

  Saving scenario files and accompanying files in separate folders, you can easily move the folder for scenarios.



When the ‘Call scenario file’ node or a subscenario is executed in a scenario, the work folder is changed to the file path of the called or executed scenario file.

To execute WinActorEye libraries properly after such call or execution in the scenario, place the ‘Eye_SetWorkFolder’ library before the WinActorEye libraries and specify ‘Scenario_folder’ for ‘Specify_the_folder’ property, or place the ‘Eye_ReadAndRunMacro’ library before the WinActorEye libraries and change the work folder back in the macro file specified in it.

4.2.2 from Clipboard

"Figure 4-4. “ "Input image" window (from Clipboard)" shows a window to be displayed when you select "from Clipboard" as a method of inputting image data in the Input image window.

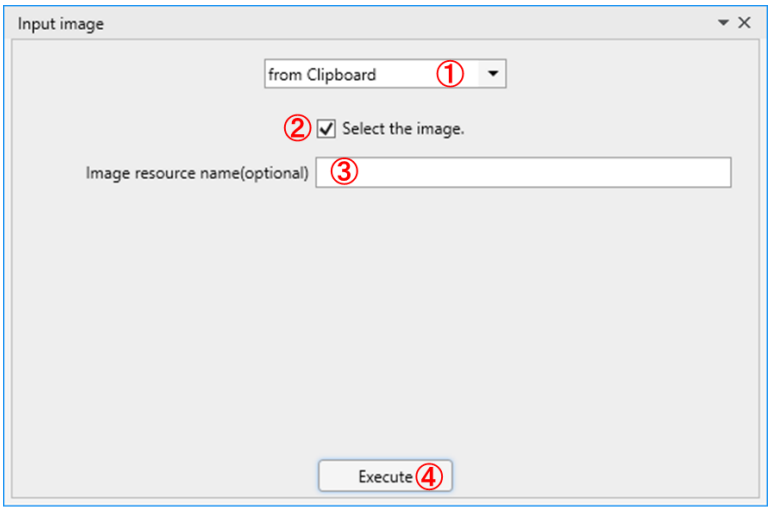


Figure 4-4. "Input image" window (from Clipboard)

The operation procedure to input image data from the clipboard is as follows.

① Select "from Clipboard" as a method of inputting image data.

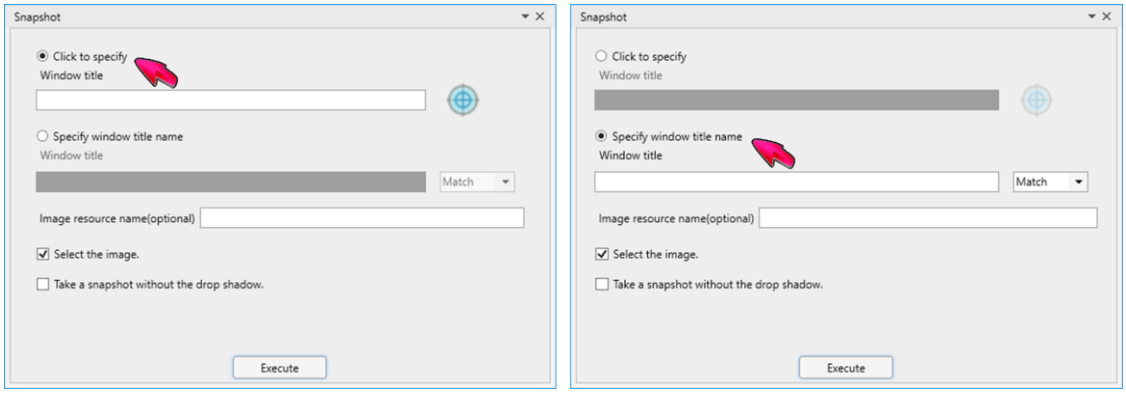
② Check the box to set the input image to the selected state.

③ Specify an image resource name. It can be omitted. If omitted, the image resource name will be "clipboard."

④ Click the button to input the image data based on the settings made in ① to ③.
When "Select the image " is checked in ②, the input image will be displayed in the image input area.
Image information will be registered or updated as an image resource. If the specified resource name already exists, the image information of the image resource will be overwritten and updated.
If the resource name does not exist, it will be newly registered.

4.3 Snapshot

"Snapshot" is a function to input image data by specifying an image to be input with a mouse click or by specifying a window title name.



When "Click to specify" is selected　　When "Specify window title name" is selected

Figure 4-5. "Snapshot" window

Depending on your environment and target application, it may be acquired in an inactive state. When you run a macro including the snapshot function using the "Eye_ReadAndRunMacro" library, place the "Window_BringWindowToTop" and "Wait for Time" nodes immediately above the "Eye_ReadAndRunMacro" library in the flowchart area of WinActor, and it may improve the deactivation.

- Window_BringWindowToTop　Library: 11_Window/Window_BringWindowToTop*
- Wait for Time　　Node: Action / Wait for Time*

* For details on the user libraries and nodes, see "WinActor User Library Sample Manual" and "WinActor Operation Manual."

4.3.1 Drop shadow

The shadow around the application window as shown in Figure 4-6 is called a drop shadow in this function.

In "Snapshot", you can select the presence or absence of the drop shadow when inputting image data.

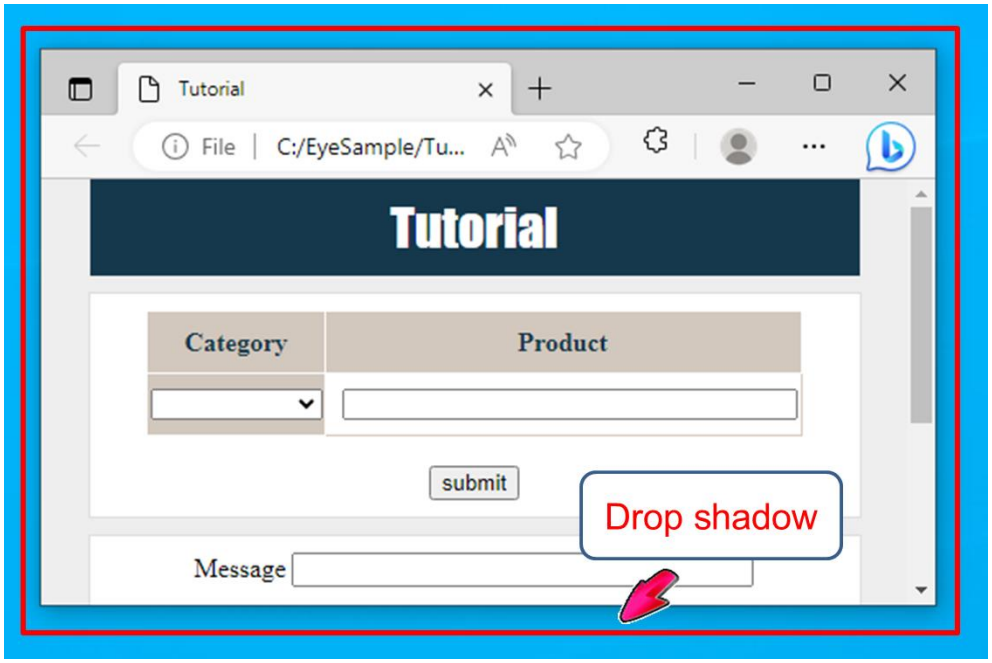


Figure 4-6. Drop shadow (shadow between the application window and the red frame)

Set the drop shadow when performing a mouse action on a matched location using the user libraries.

4.3.2 Click to specify

"Figure 4-7. 'Figure 4-7. "Snapshot" window (Click to specify)" shows a window to be displayed when you select "Click to specify" as a method of inputting image data in the Snapshot window.

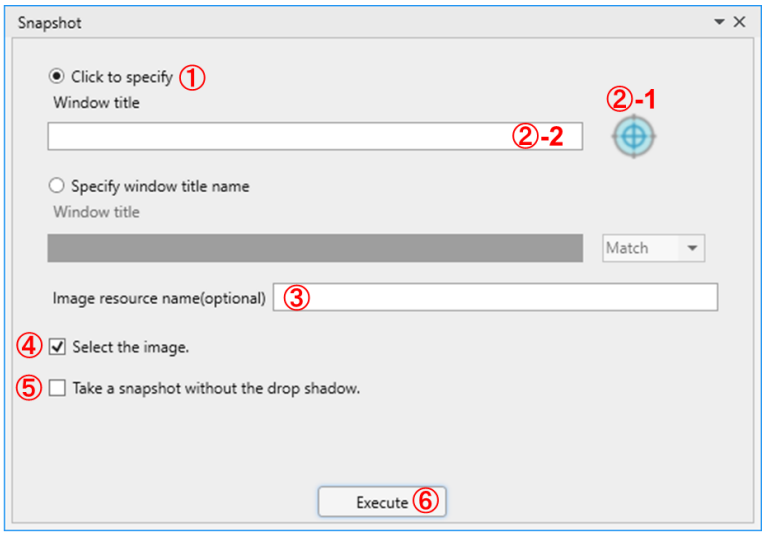


Figure 4-7. "Snapshot" window (Click to specify)

The operation procedure to specify image data by clicking is as follows.

① Select "Click to specify" as a method of inputting image data.

② Click the "Select target window" button (②-1) and specify a target application widow by clicking it. The acquired window title name will be automatically entered in the window title field (②-2). You can also manually edit the text in the window title field (②-2). When targeting the entire desktop, leave ②-2 blank.

③ Specify an image resource name. It can be omitted. If omitted, the window title specified in ②-2 will be the image resource name.

④ Check the box to set the input image to the selected state.

⑤ Check the box to input the image data without the drop shadow.

⑥ Click the button to input the image data based on the settings made in ① to ⑤.
When "Select the image " is checked in ④, the input image will be displayed in the image input area.
Image information will be registered or updated as an image resource. If the specified resource name already exists, the image information of the image resource will be overwritten and updated.
If the resource name does not exist, it will be newly registered.

4.3.3 Specify window title name

"Figure 4-8. "Snapshot" window (Specify window title name)" shows a window to be displayed when you select "Specify window title name" as a method of inputting image data in the Snapshot window.

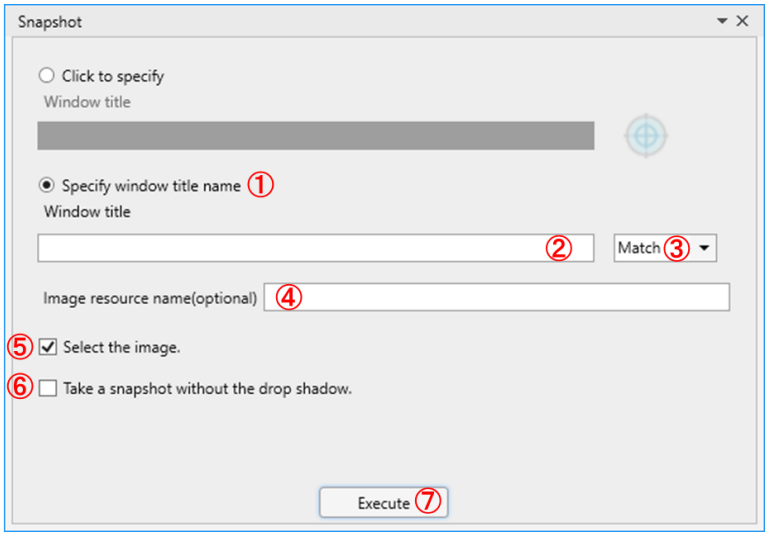


Figure 4-8. "Snapshot" window (Specify window title name)

The operation procedure to specify image data by a window title name is as follows.

① Select "Specify window title name" as a method of inputting image data.

② Specify a window title of a target application window.
When targeting the entire desktop, leave ② blank.

③ Select "Match" or "Include" for the condition for the window title specified in ②.

④ Specify an image resource name. It can be omitted. If omitted, the window title specified in ② will be the image resource name.

⑤ Check the box to set the input image to the selected state.

⑥ Check the box to input the image data without the drop shadow.

⑦ Click the button to input the image data based on the settings made in ① to ⑥.
When "Select the image" is checked in ⑤, the input image will be displayed in the image input area.
Image information will be registered or updated as an image resource. If the specified resource name already exists, the image information of the image resource will be overwritten and updated.
If the resource name does not exist, it will be newly registered.

5 Output

5.1 Output menu

The Output menu has a function for outputting an image resource created/edited on WinActorEye to a file or the clipboard.

Click "Output" on the menu bar to display its function as shown in "Figure 5-1" below.

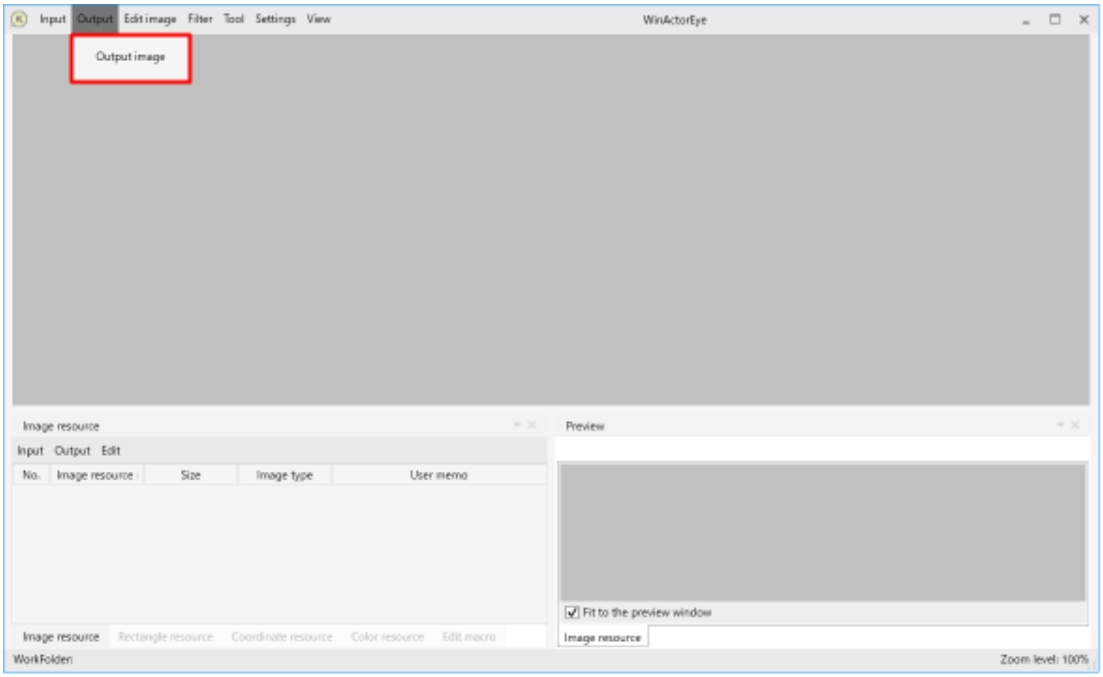


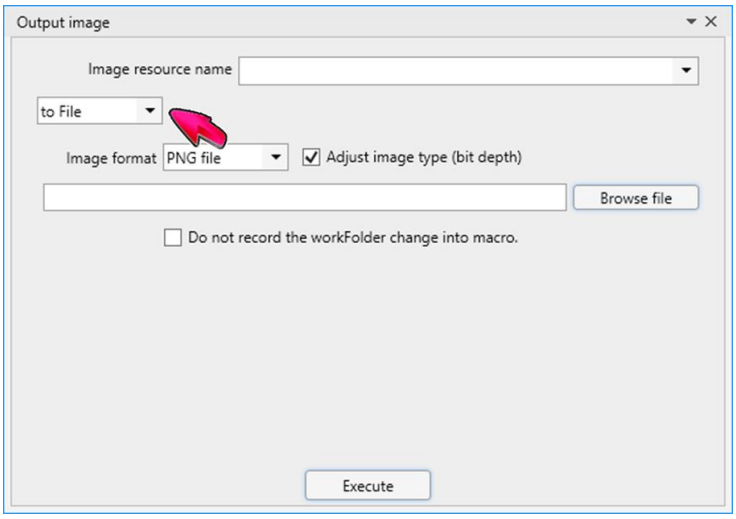
Figure 5-1. Output menu

Table 5-1. Output menu

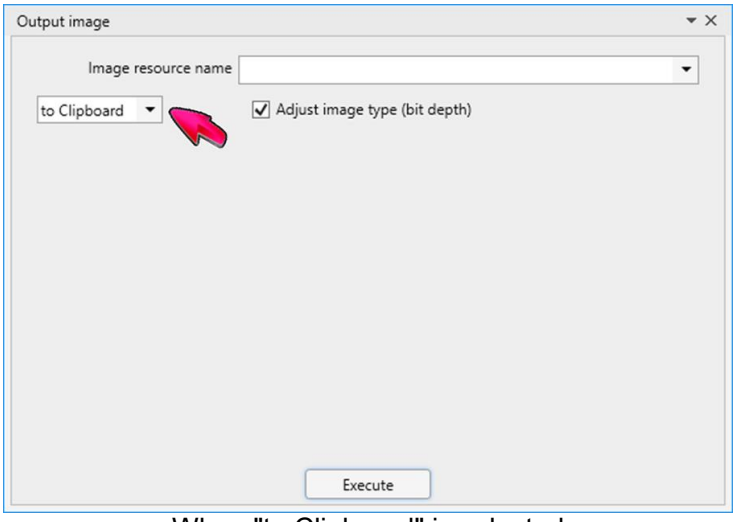
No.	Function	Description
1	Output image	Displays the "Output image" window. For details, see "5.2 Output image."

5.2 Output image

"Output image" is a function to output image data to a file or the clipboard.



When "to File" is selected



When "to Clipboard" is selected

Figure 5-2. "Output image" window

5.2.1 to File

"Figure 5-3. "Output image" window (to File)" shows a window to be displayed when you select "to File" as a method of outputting image data in the Output image window.

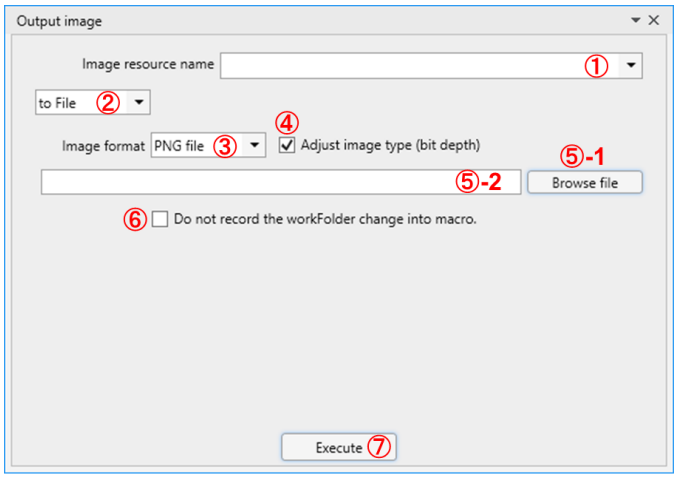


Figure 5-3. "Output image" window (to File)

The operation procedure to output image data to a file is as follows.

① Select an image resource name from the drop-down list or specify it manually. It can be omitted. If omitted, the resource being selected in the "Image resource" pane will be specified.

② Select "to File" as a method of outputting the image data.

③ Select an output file format. The image format can be selected from "PNG file," "JPG file," and "BMP file."

④ Check the box to adjust the image type (bit depth) automatically. When checked, the image type according to the image format in ③ will be output.

⑤ Click the "Browse file" button (⑤-1) and specify where to reference a file. The file path name of the referenced location will be automatically entered in the file path field (⑤-2). You can also manually edit the file path field (⑤-2). The file path extension will be the image file format selected in ③.

⑥ Check the box to not record the work folder change when recording a macro. When unchecked (set to record), a macro that changes the work folder to the reference destination specified in ⑤-2 will be automatically generated. If you do not want to change the work folder, check the box (set to not record).

⑦ Click the button to output the image data based on the settings made in ① to ⑥. If the file name specified in the file path field (⑤-2) already exists, the file will be overwritten and updated.

5.2.2 to Clipboard

"Figure 5-4. "Output image" window (to Clipboard)" shows a window to be displayed when you select "to Clipboard" as a method of outputting image data in the Output image window.

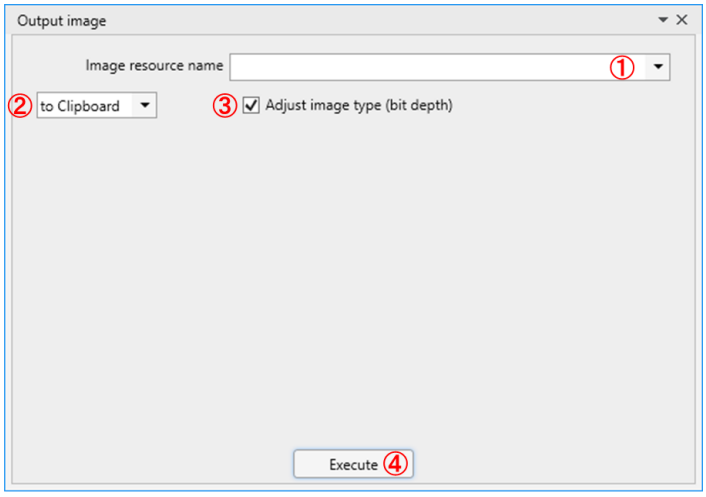


Figure 5-4. "Output image" window (to Clipboard)

The operation procedure to output image data to the clipboard is as follows.

① Select an image resource name from the drop-down list or specify it manually. It can be omitted. If omitted, the resource being selected in the "Image resource" pane will be specified.

② Select "to Clipboard" as a method of outputting the image data.

③ Check the box to adjust the image type (bit depth) automatically.

④ Click the button to output the image data based on the settings made in ① to ③.

6 Edit image

6.1 Edit image menu

The Edit image menu has a function for editing and processing an image resource.

Click "Edit image" on the menu bar to display its function as shown in "Figure 6-1. Edit image menu" below.

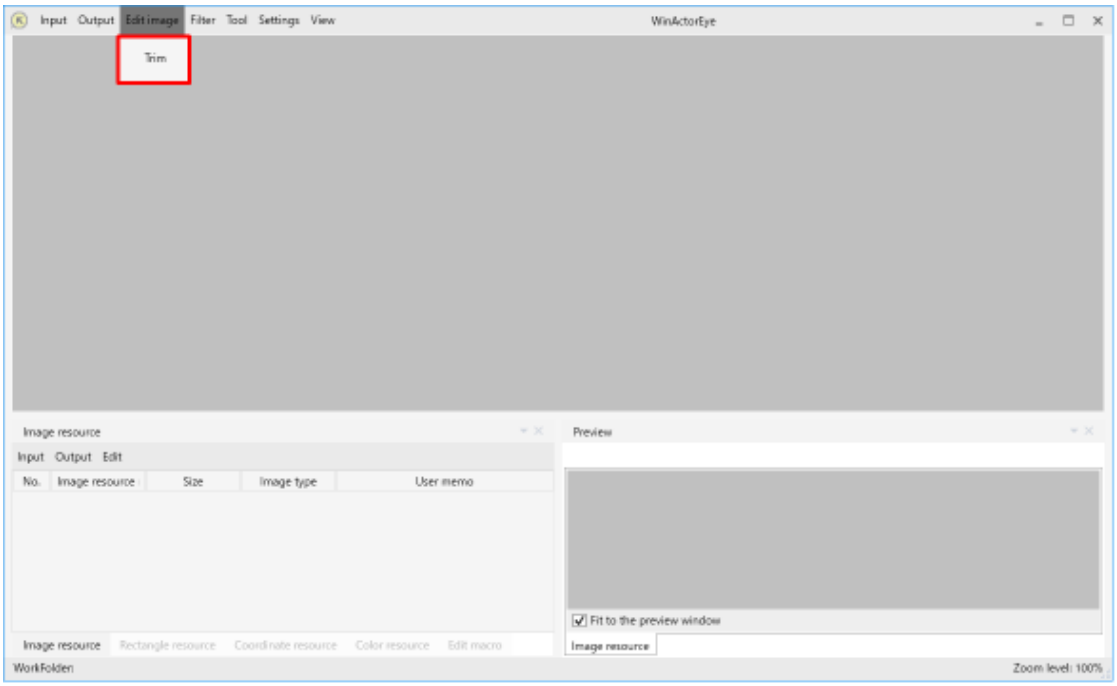


Figure 6-1. Edit image menu

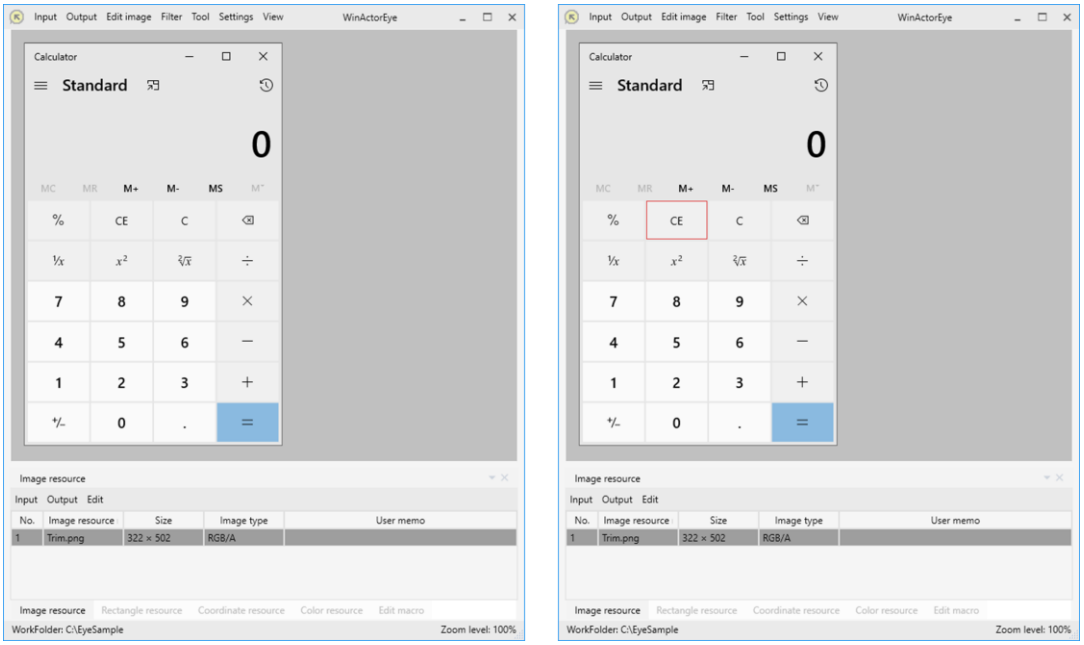
Table 6-1. Edit image menu

No.	Function	Description
1	Trim	Displays the "Trim" window. For details, see "6.2 Trim."

6.2 Trim

"Trim" is a function to cut out an image resource input by the Input function.

To perform trimming operation, specify an area to be cut out by dragging on the image input area.



Before selecting the area

After selecting the area

Figure 6-2. Selecting the trimming area

The elements of the "Trim" window are as shown in "Figure 6-3. "Trim" window."

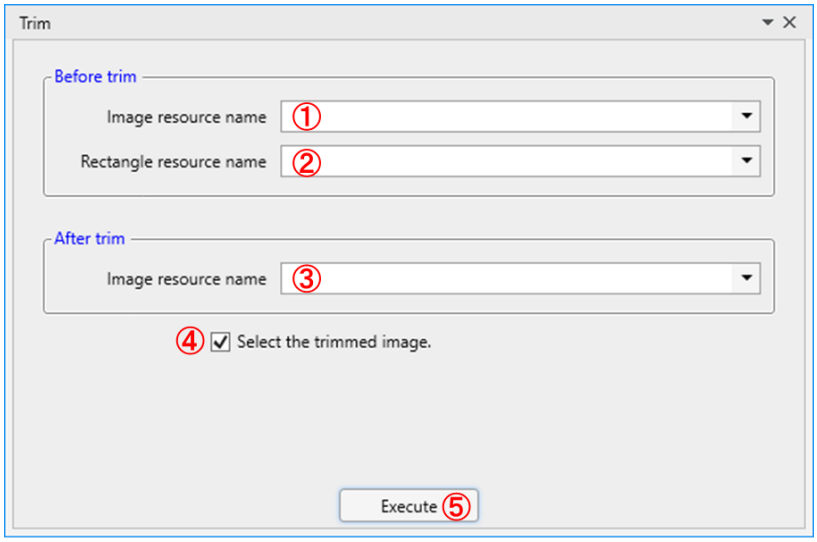


Figure 6-3. "Trim" window

The operation procedure of the "Trim" window is as follows.

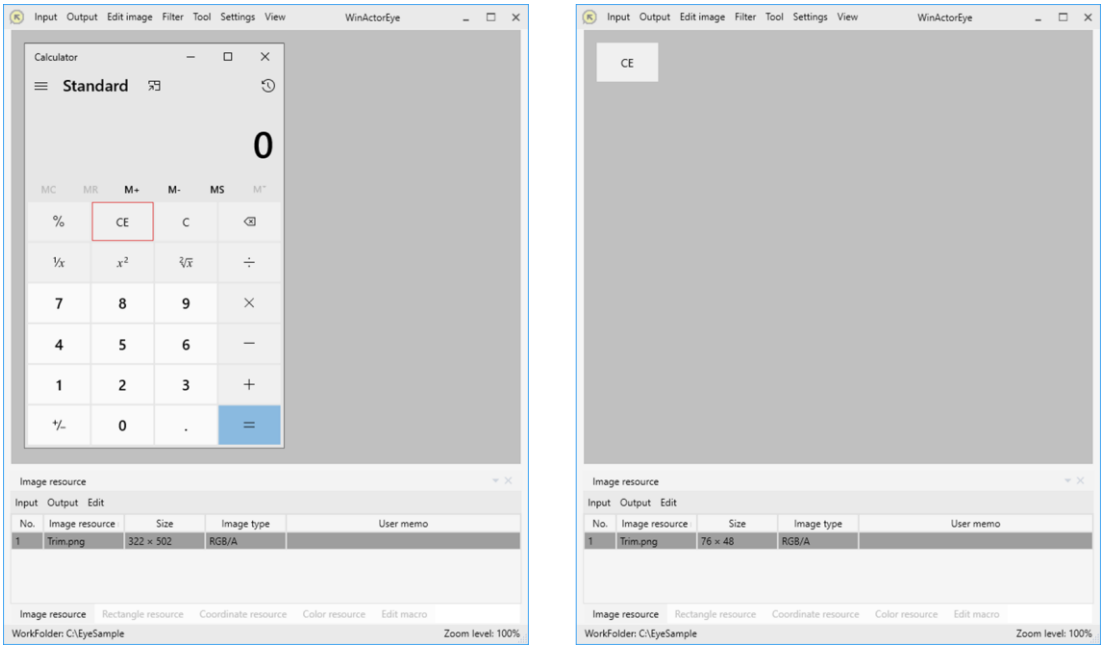
① Select an image resource name before trim from the drop-down list or specify it manually. If unselected or not entered (null character), the resource being selected in the "Image resource" pane will be specified.

② Select a rectangle resource name before trim from the drop-down list or specify it manually. If unselected or not entered (null character), the resource being selected in the "Rectangle resource" pane will be specified.

③ Select an image resource name after trim from the drop-down list or specify it manually. If unselected or not entered (null character), it will be registered in the image resource specified in the "Image resource name" before trim in ①.

④ Check the box to set the trimmed image to the selected state. (The image will be displayed in the image input area.)

⑤ Click the button to edit the image to cut out the image within the rectangle resource (red frame) based on the settings made in ① to ④. Image information will be registered or updated as an image resource.
If the resource name specified in the image resource name after trim in ③ already exists, the image information of the image resource will be overwritten and updated. If the resource name does not exist, it will be newly registered.



Before trim

After trim

Figure 6-4. Example of editing the image using Trim

7 Filter

7.1 Filter menu

The Filter menu has functions for getting information from an image resource or rectangle resource and for converting a resource into a different resource.

Click "Filter" on the menu bar to display its functions as shown in "Figure 7-1. Filter menu" below.

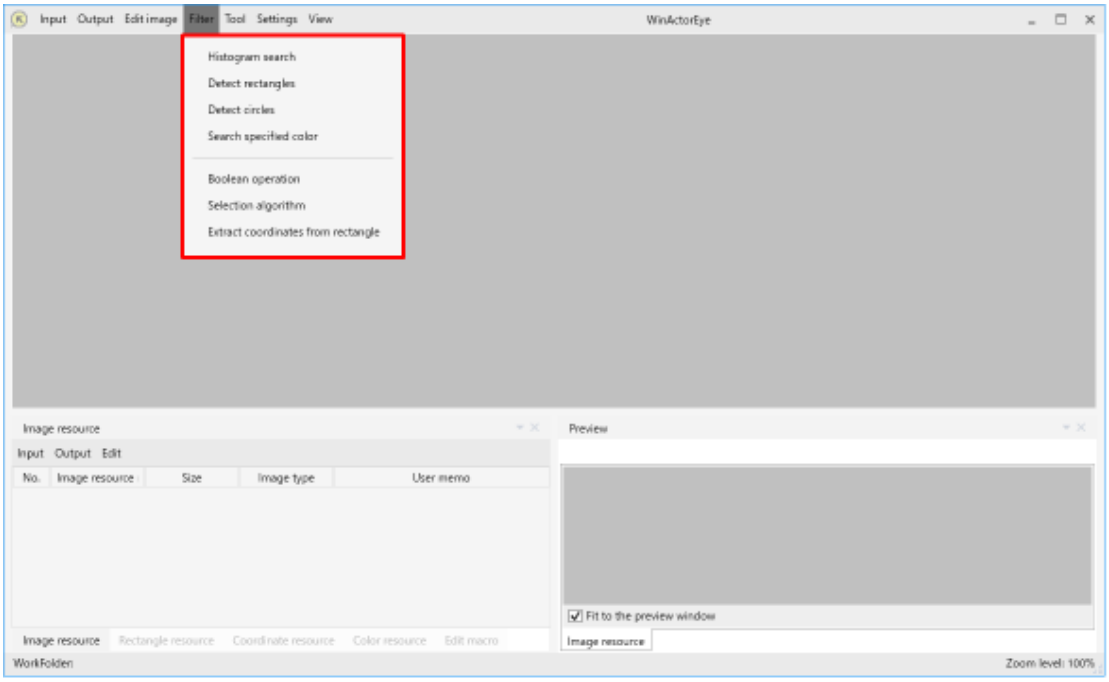


Figure 7-1. Filter menu

Table 7-1. Filter menu

No.	Action	Function	Description
1	Matching	Histogram search	Displays the "Histogram search" window. For details, see "7.3 Histogram search."
2		Detect rectangles	Displays the "Detect rectangles" window. For details, see "7.4 Detect rectangles
3		Detect circles	Displays the "Detect circles" window. For details, see "7.5 Detect circles."
4		Search specified color	Displays the "Search specified color" window. For details, see "7.6 Search specified color."
5	Resource narrowing and conversion	Boolean operation	Displays the "Boolean operation" window. For details, see "7.7 Boolean operation
6		Selection algorithm	Displays the "Selection algorithm" window. For details, see "7.8 Selection algorithm
7		Extract coordinates from rectangle	Displays the "Extract coordinates from rectangle" window. For details, see "7.9Extract coordinates from rectangle

7.2 Terms used in parameters

This section describes the terms used as parameters for the filter functions.

7.2.1 Number of pixels on a contour

The number of pixels is the points that make up a contour of a target for matching. As shown in Figure 7-2. Example of the number of pixels on the contour, the number of pixels on the contour varies depending on the shapes even if the images have the same size.

Image resources output by "Filter" that uses pixels on contours are composed of black and white as shown in Figure 7-13 and Figure 7-18.

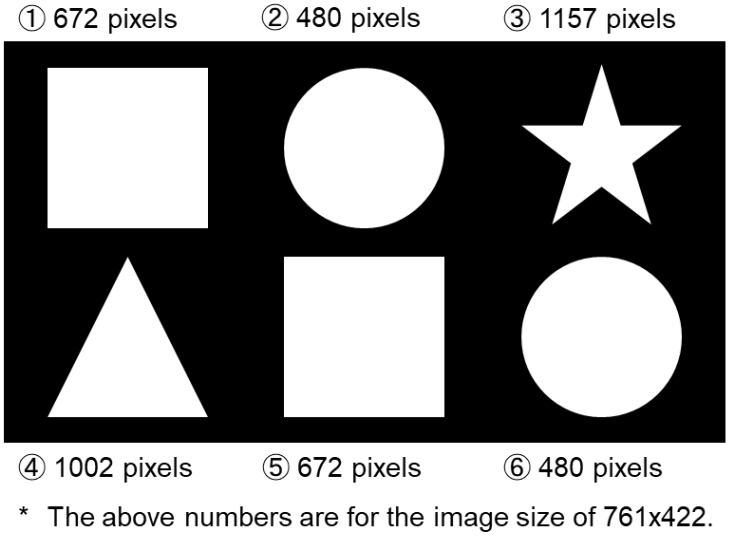


Figure 7-2. Example of the number of pixels on the contour

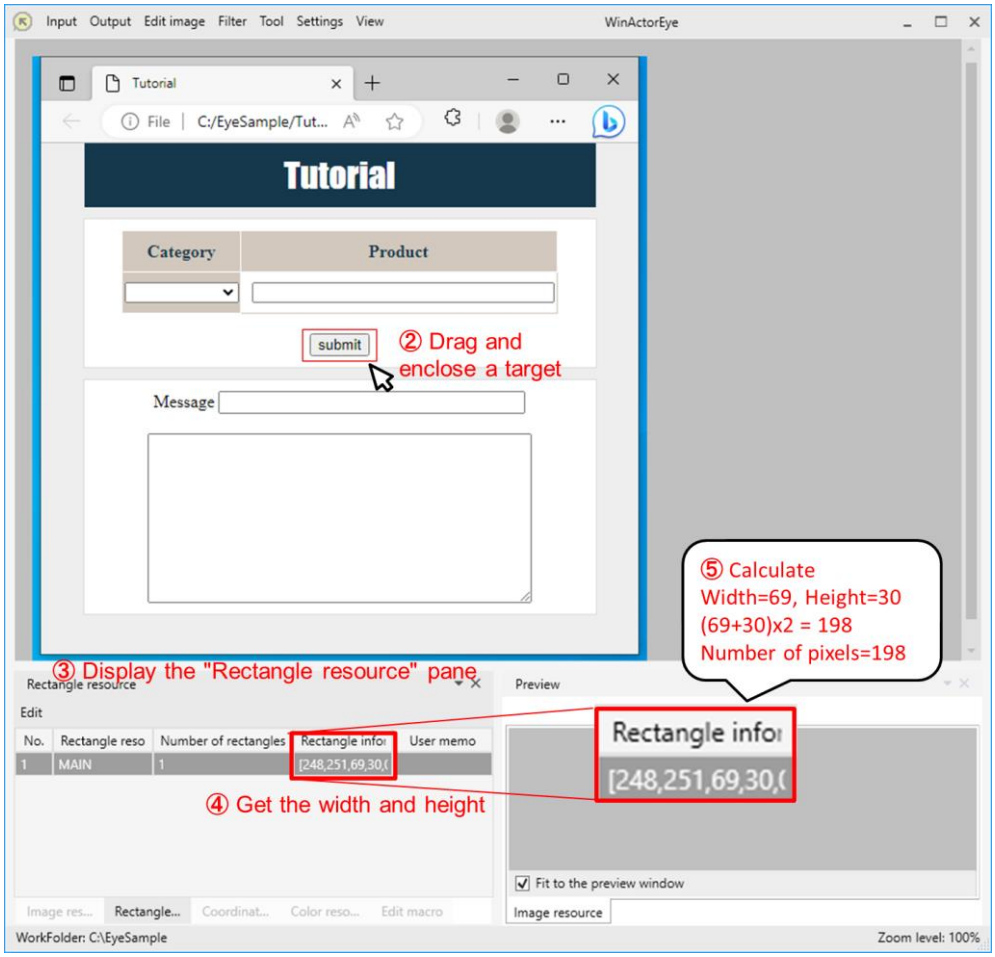


Figure 7-3. Checking the number of pixels on the contour of the rectangle

You can adjust a rectangle resource output by "Filter" by adjusting the minimum and maximum values of pixels on the contour.

The method of checking the number of pixels on the contour of a rectangle is as follows.

① Register an image or a window that contains a target for matching in the image resource.
For the registration method of an image resource, see "4 Input."

② On the main window, drag and enclose a target for matching.

③ Click "Rectangle resource" in the "View" menu to display the "Rectangle resource" pane.
For the "Rectangle resource" pane, see "10.4 Rectangle resource."

④ Get the width and height of "MAIN" registered in the "Rectangle resource" pane. For details on rectangle information, see "Table 10-6. Items in the rectangle resource area. Items in the rectangle resource area."

⑤ Approximate number of pixels on the contour can be calculated by calculating as shown in Figure 7-3 based on the width and height information acquired in ④.

7.2.2 Number of allowable vertices

In "7.4 Detect rectangles," the number of contours and vertices of a target for matching are used to detect rectangles.

In the case of a rectangle, the number of vertices is eight because it becomes as shown in Figure 7-4. However, it may actually have more than eight vertices even if it looks rectangle. In such a case, the detection can be performed by specifying the number of allowable vertices to be eight or more.

For the number of vertices in other shapes, see "Figure 7-5. Example of the number of allowable vertices." Note that Figure 7-5. Example of the number of allowable vertices is for reference only and may not always be exactly as stated.

Some figures such as circles have more or less vertices depending on the size of the image.

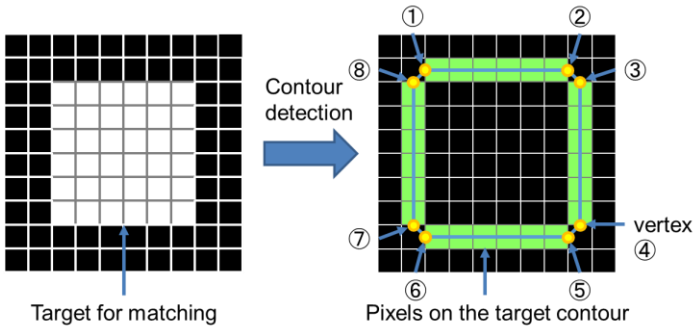


Figure 7-4. Vertices when detecting a rectangle

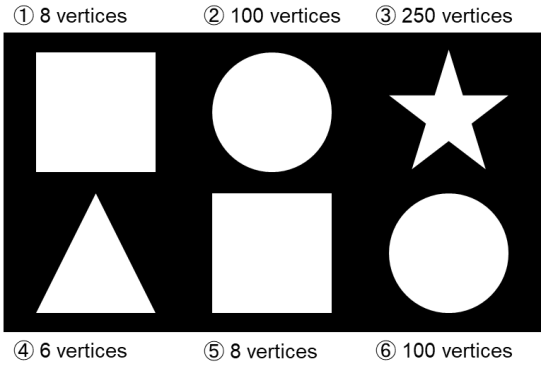


Figure 7-5. Example of the number of allowable vertices

7.2.3 Open and closed contours

An open contour is a contour whose start and end points do not meet, such as "⊐."

A closed contour is a contour whose start and end points meet, such as "□."

7.2.4 Roundness and level of correction

In "7.5 Detect circles," "Roundness" and "Level of correction" are used to detect round-shaped areas. You can specify values for "Roundness" and "Level of correction" in the range of 1 to 5.

For "Roundness," round objects can be detected when the value is increased, and square objects can be detected when the value is decreased.

For "Level of correction," only perfect circles can be detected when the value is increased, and ellipses or small circles can be detected when the value is decreased.

Figure 7-6 to Figure 7-9 are examples of parameter adjustments when you want to detect only perfect circles from the input image in which "perfect circles" and "non-round circles" are mixed.

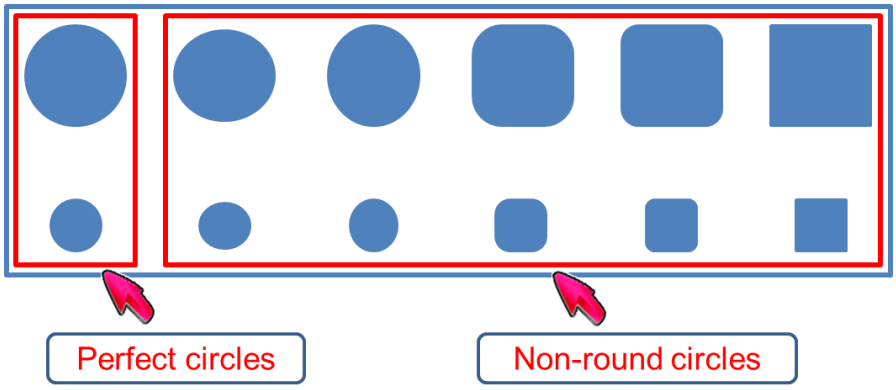


Figure 7-6. Input image

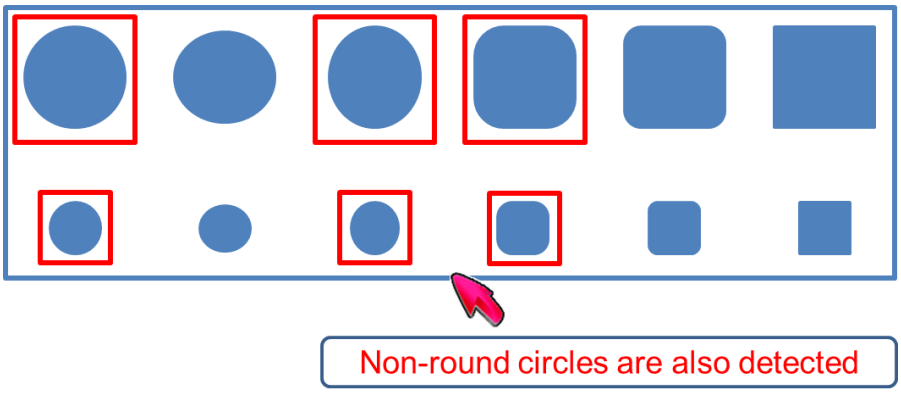


Figure 7-7. Example 1 (Roundness: 3, Level of correction: 3)

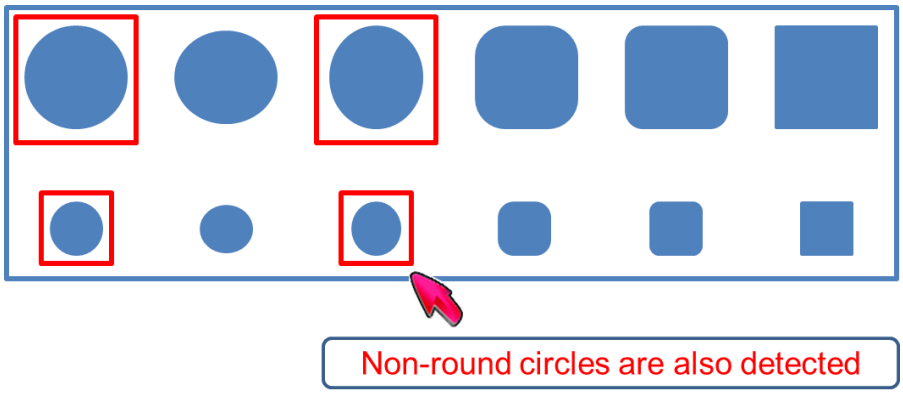


Figure 7-8. Example 2 (Roundness: 5, Level of correction: 3)

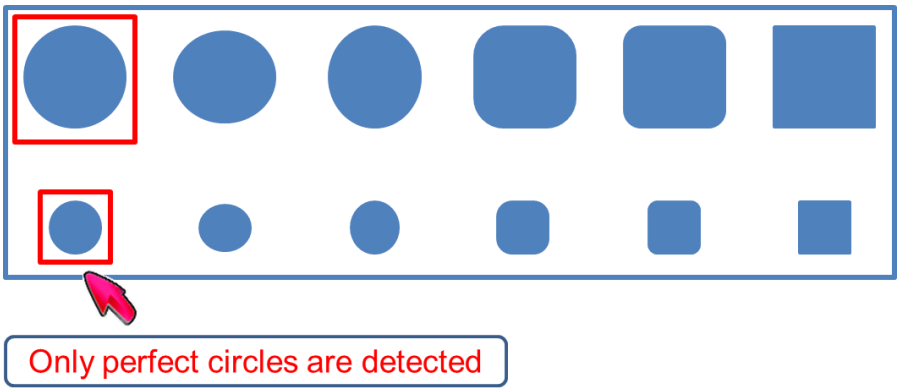


Figure 7-9. Example 3 (Roundness: 5, Level of correction: 5)

7.3 Histogram search

"Histogram search" is a function to search for areas on a reference base image resource that have a color similar to a reference image resource as shown in "Figure 7-10. . Histogram search

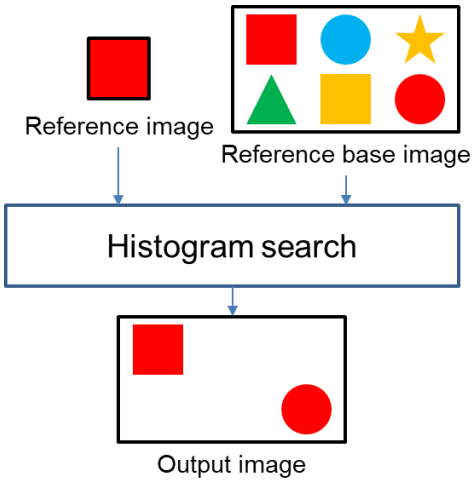


Figure 7-10. Histogram search

Since this is a matching method that focuses on color information, it is less susceptible to the effect of display size than the existing Image Matching and Contour Matching.

Click "Histogram search" in the "Filter" menu to display the "Histogram search" window shown in Figure 7-11.

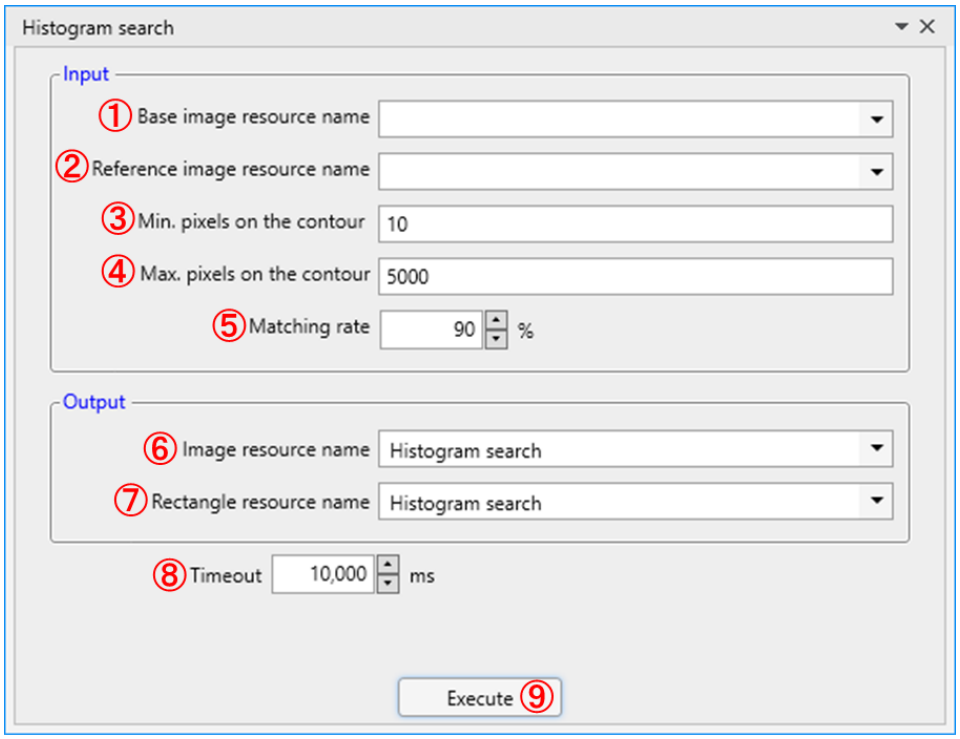


Figure 7-11. "Histogram search" window

The operation procedure of the "Histogram search" window is as follows.

① Specify a base image resource name.

② Specify a reference image resource name.

③ Enter the minimum number of pixels on the contour. For the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour larger than this number will be output.

④ Enter the maximum number of pixels on the contour. For the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour smaller than this number will be output.

⑤ Set the matching rate. The larger the matching rate, the more accurately the target can be found.

⑥ Specify an output image resource name.

⑦ Specify an output rectangle resource name.

⑧ Set the timeout value. (The timeout time depends on the specifications of your computer.)

⑨ Click the button to search for the areas that match the reference image resource on the base image resource based on the settings made in ① to ⑧.

After executing, the areas that match the reference image will be displayed in white in the image input area as shown in Figure 7-13. If there is no matching area, only the black background will be displayed.

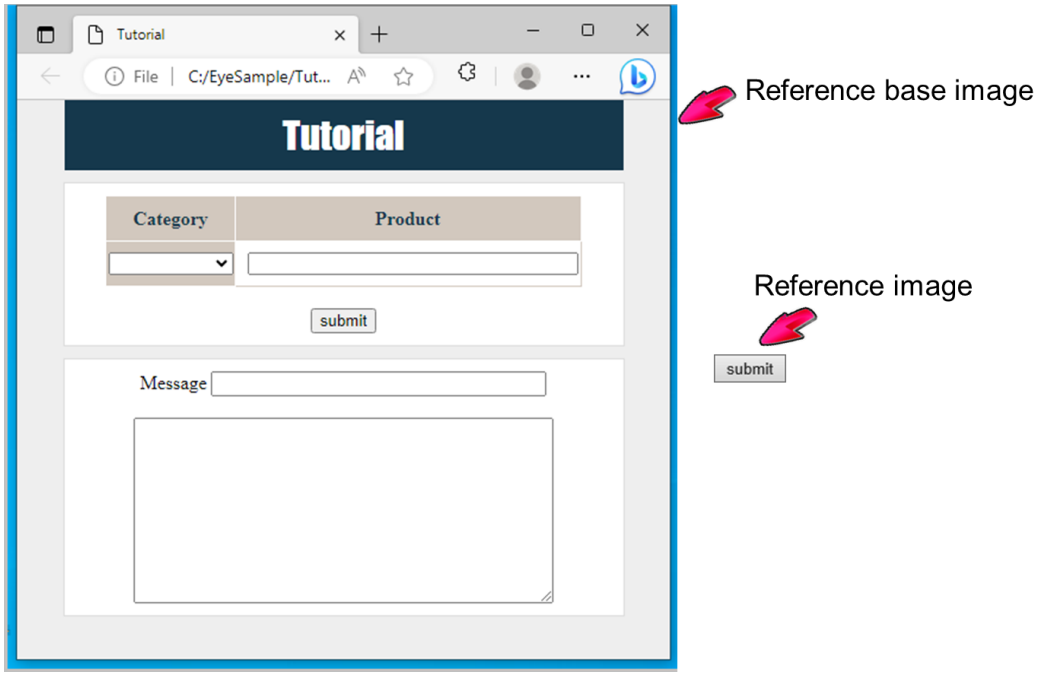


Figure 7-12. Input image

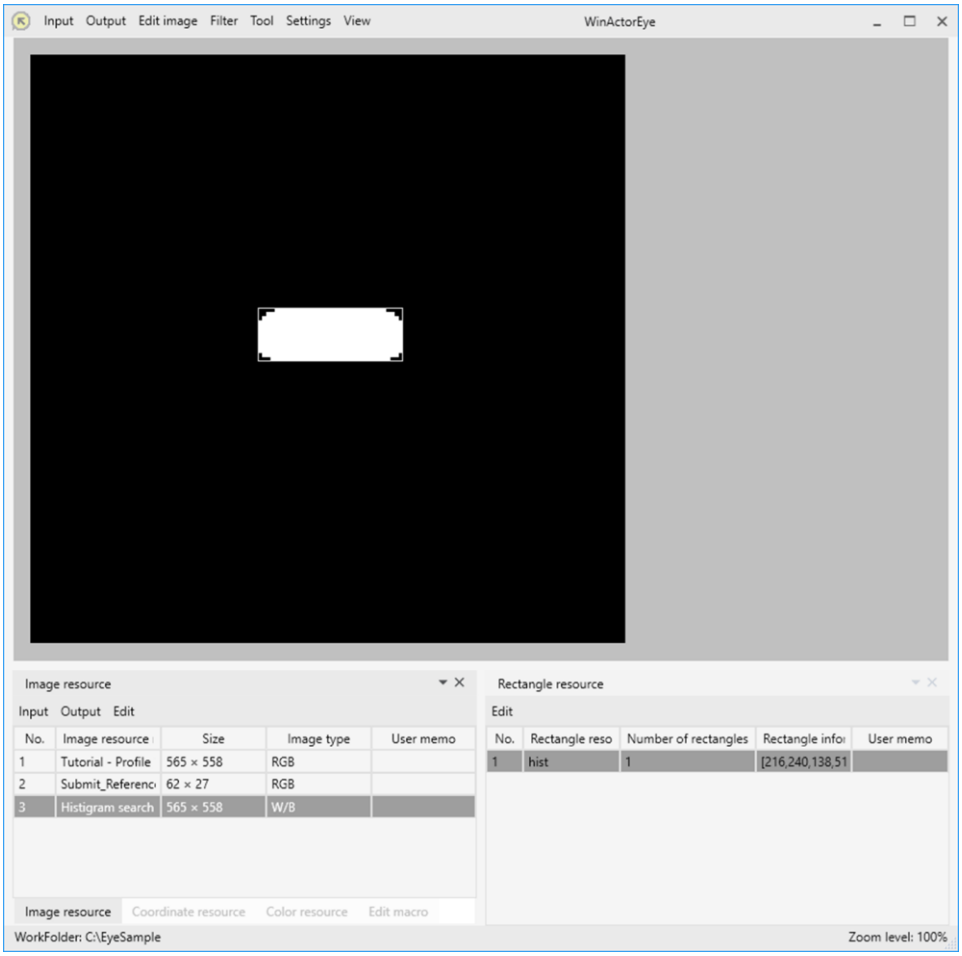


Figure 7-13. Example of executing "Histogram search"

Furthermore, by selecting the base image resource specified in the step ① after executing "Histogram search," you can check the result with the matching result overlaid on the base image resource as shown in Figure 7-14.

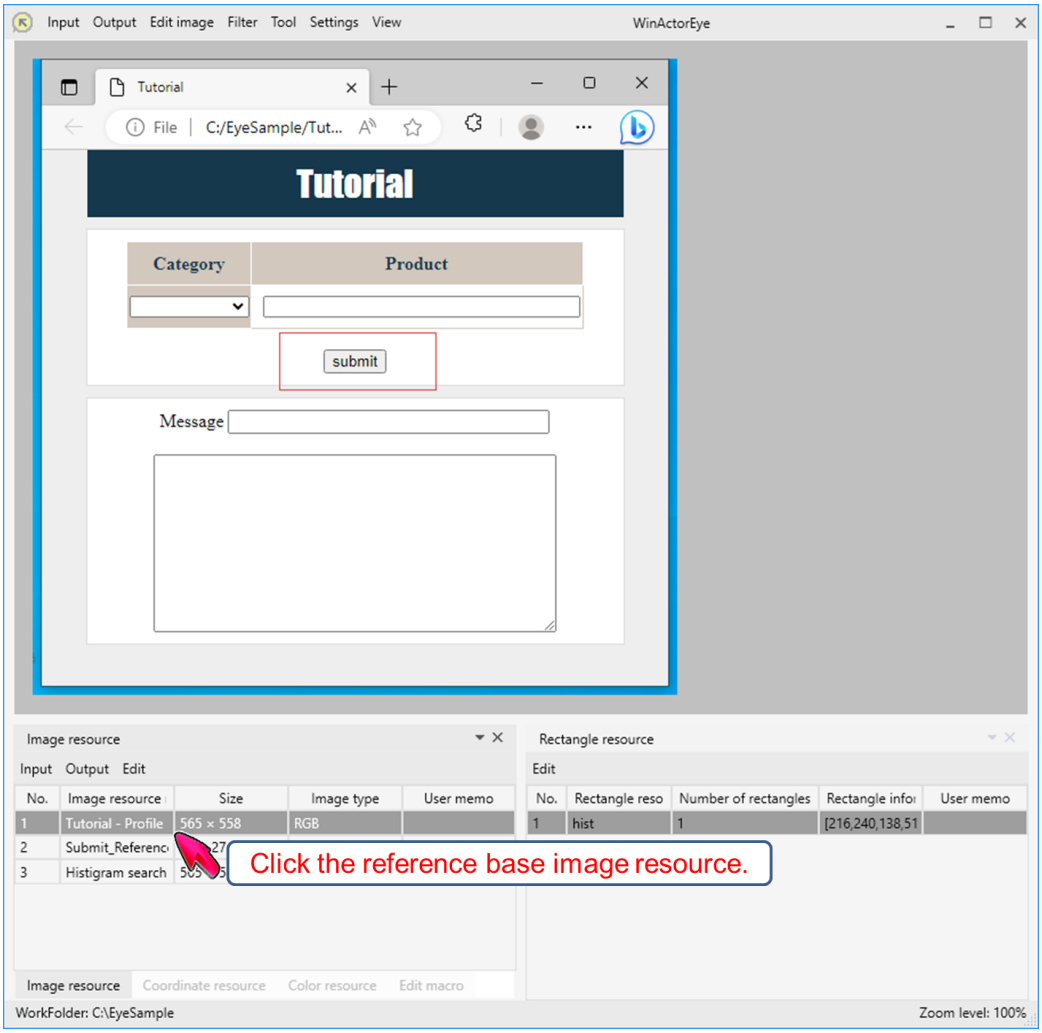


Figure 7-14. Example of executing "Histogram search" (with the rectangle resource overlaid on the base image resource)

7.4 Detect rectangles

"Detect rectangles" is a function to search for rectangles on a specified image resource.

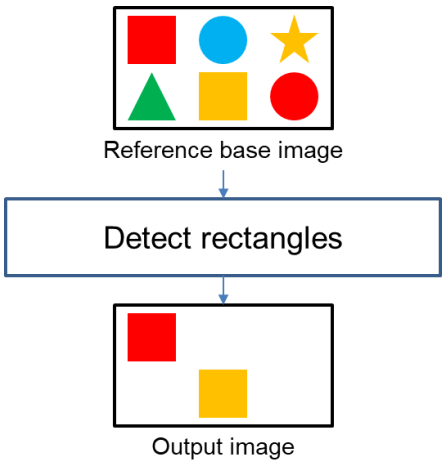


Figure 7-15. Detect rectangles

This is a matching function suitable when the targets for matching are rectangles such as buttons.

Click "Detect rectangles" in the "Filter" menu to display the "Detect rectangles" window shown in Figure 7-16.

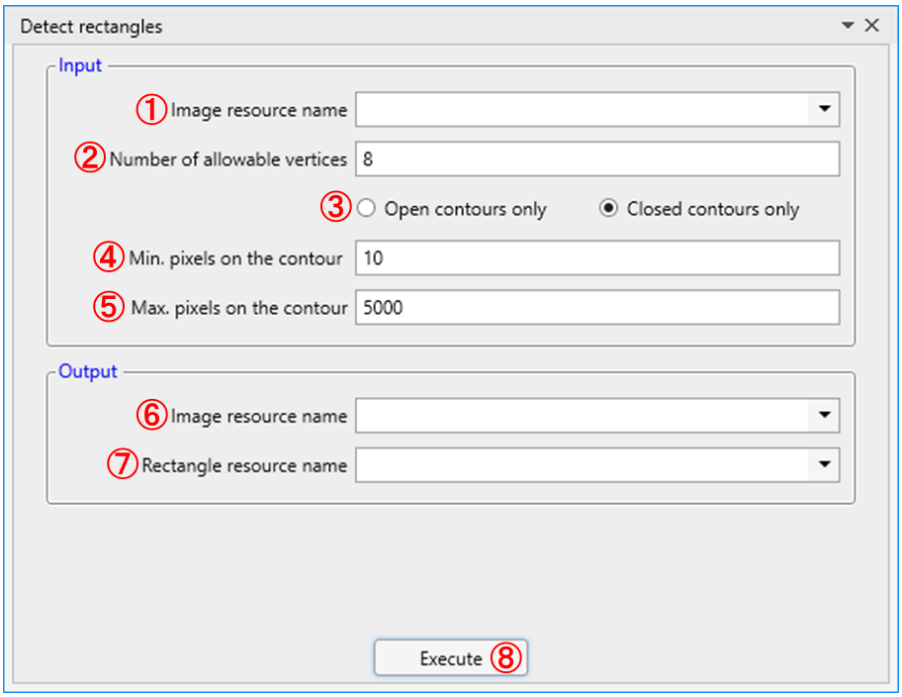


Figure 7-16. "Detect rectangles" window

The operation procedure of the "Detect rectangles" window is as follows.

① Specify an input image resource name.

② Enter the number of allowable vertices. For descriptions of the vertices, see "7.2.2 Number of allowable vertices."

③ Select "Open contours only" or "Closed contours only." For descriptions of the contours, see "7.2.3contours."

④ Enter the minimum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour larger than this number will be output.

⑤ Enter the maximum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour smaller than this number will be output.

⑥ Specify an output image resource name.

⑦ Specify an output rectangle resource name.

⑧ Click the button to detect the rectangle information and register it in the image resource and in the rectangle resource based on the settings made in ① to ⑦.

After executing, the detected rectangles will be displayed in white in the image input area as shown in Figure 7-18. If there is no rectangle detected, only the black background will be displayed.

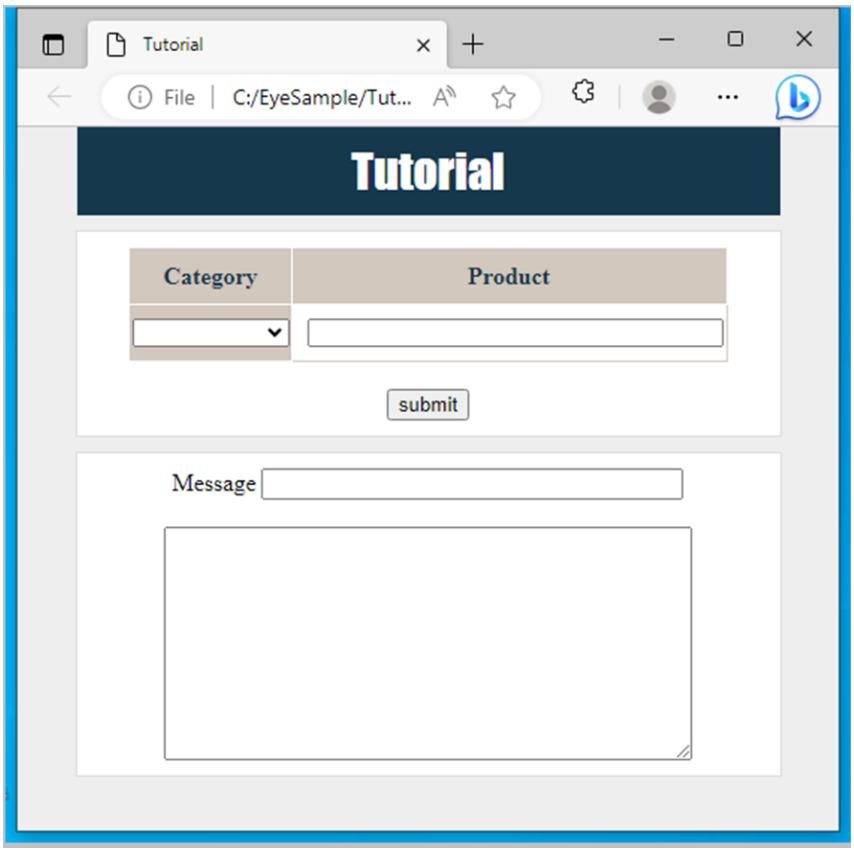


Figure 7-17. Input image

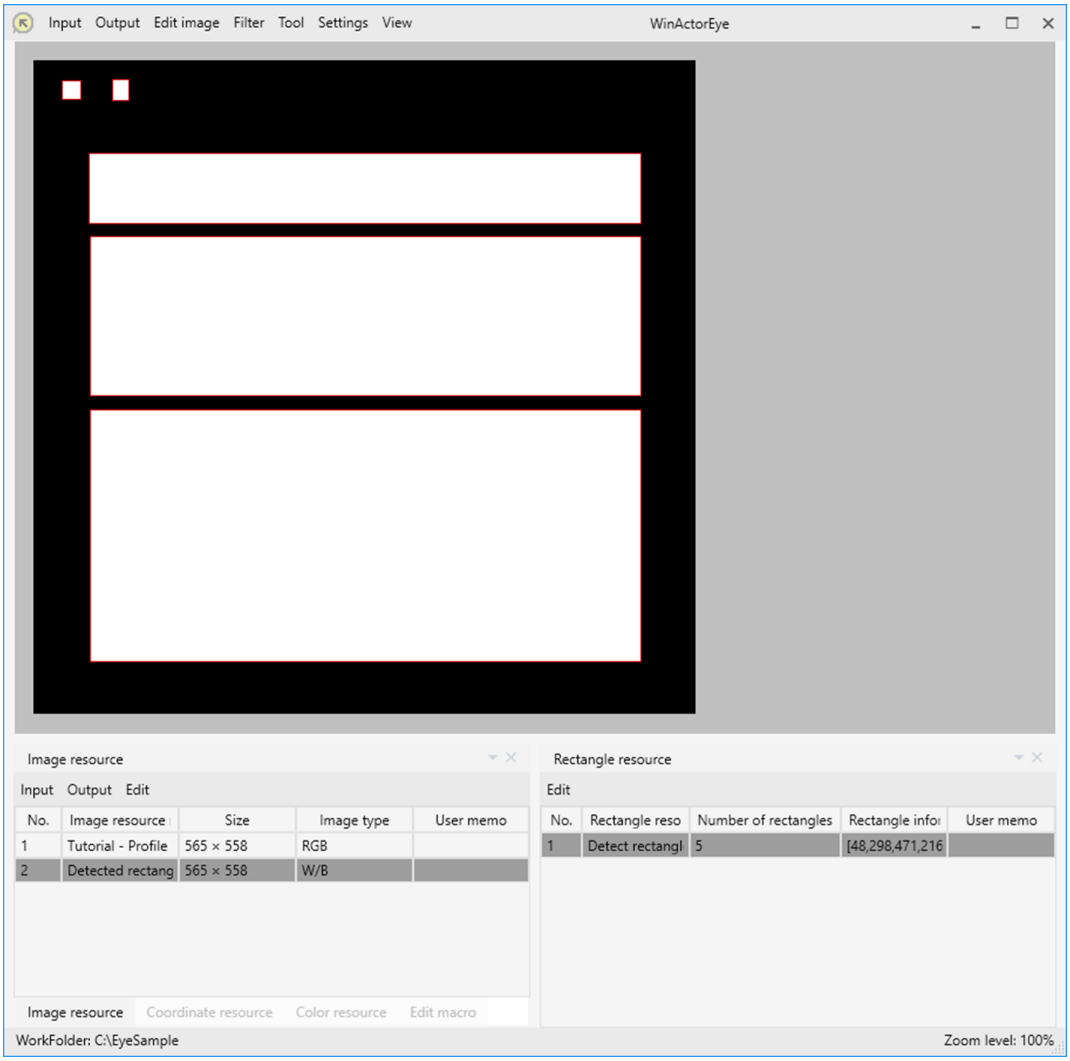


Figure 7-18. Example of executing "Detect rectangles"

Furthermore, by selecting the image resource specified in the step ① after executing "Detect rectangles," you can check the result with the rectangle information overlaid on the input image resource as shown in Figure 7-19.

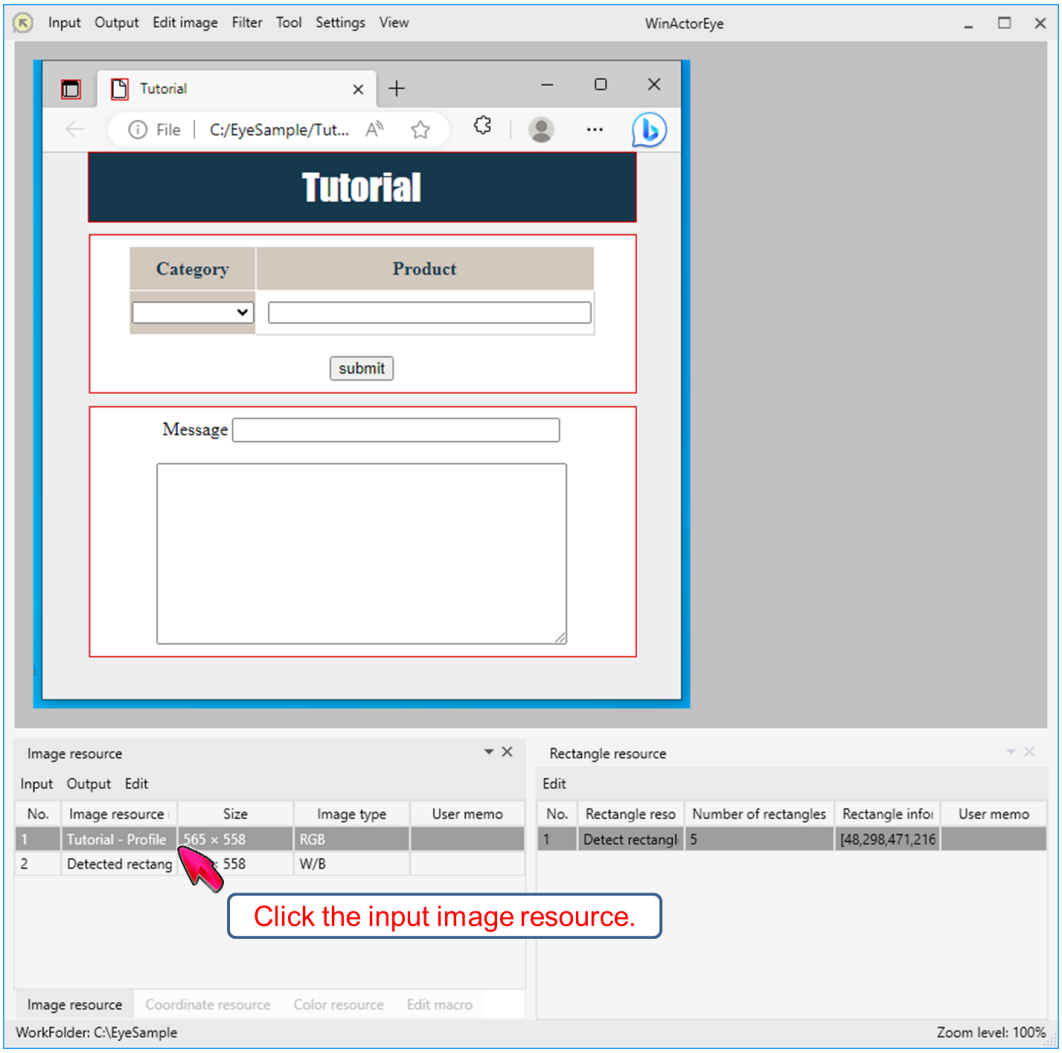


Figure 7-19. Example of executing "Detect rectangles" (with the rectangle information overlaid on the input image resource)

7.5 Detect circles

"Detect circles" is a function to search for "round-shaped areas" on a specified image resource.

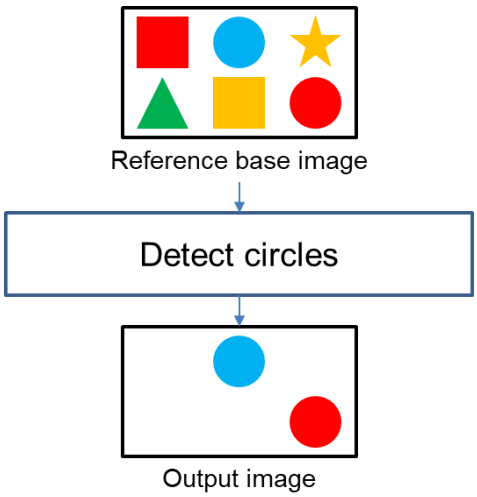


Figure 7-20. Detect circles

This is a matching function suitable when the targets for matching have round shapes such as buttons.

Click "Detect circles" in the "Filter" menu to display the "Detect circles" window shown in Figure 7-21. "Detect circles" window

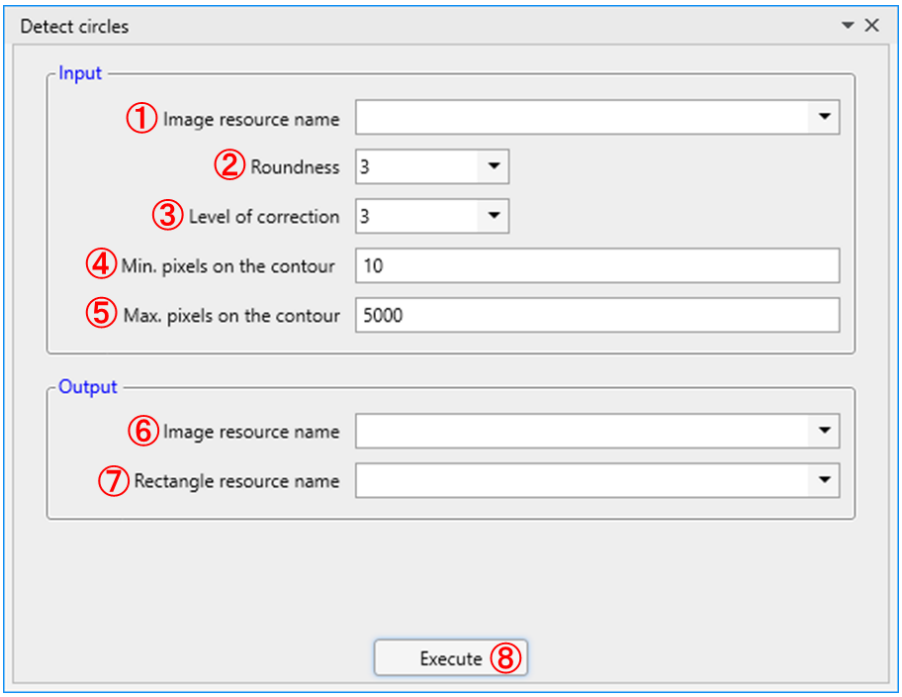


Figure 7-21. "Detect circles" window

The operation procedure of the "Detect circles" window is as follows.

① Specify an input image resource name.

② Specify a value of the roundness. For descriptions of the roundness, see "7.2.4 Roundness and level of correction."

③ Specify a value of the level of correction. For descriptions of the level of correction, see "7.2.4 Roundness and level of correction."

④ Enter the minimum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour larger than this number will be output.

⑤ Enter the maximum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour smaller than this number will be output.

⑥ Specify an output image resource name.

⑦ Specify an output rectangle resource name.

⑧ Click the button to detect the round-shaped areas and register them in the image resource and in the rectangle resource based on the settings made in ① to ⑦.

After executing, the detected round-shaped areas will be displayed in white in the image input area as shown in Figure 7-23. Example of executing "If there is no round-shaped area detected, only the black background will be displayed.

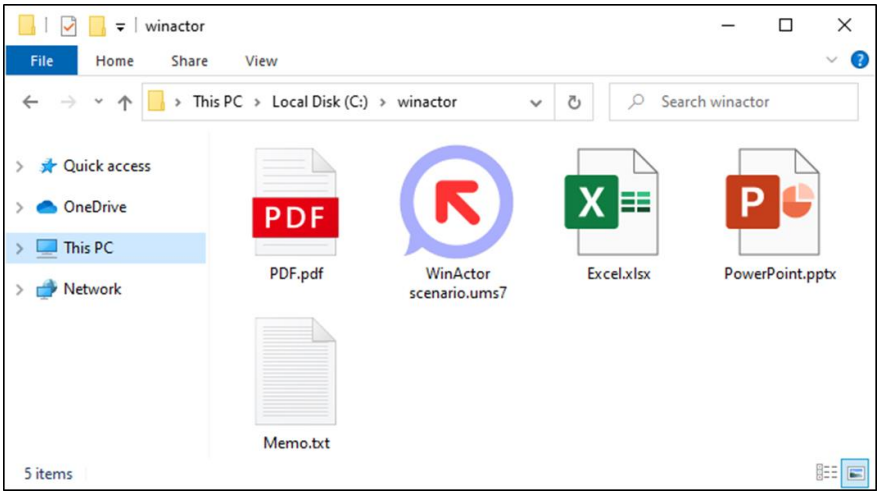


Figure 7-22. Input image

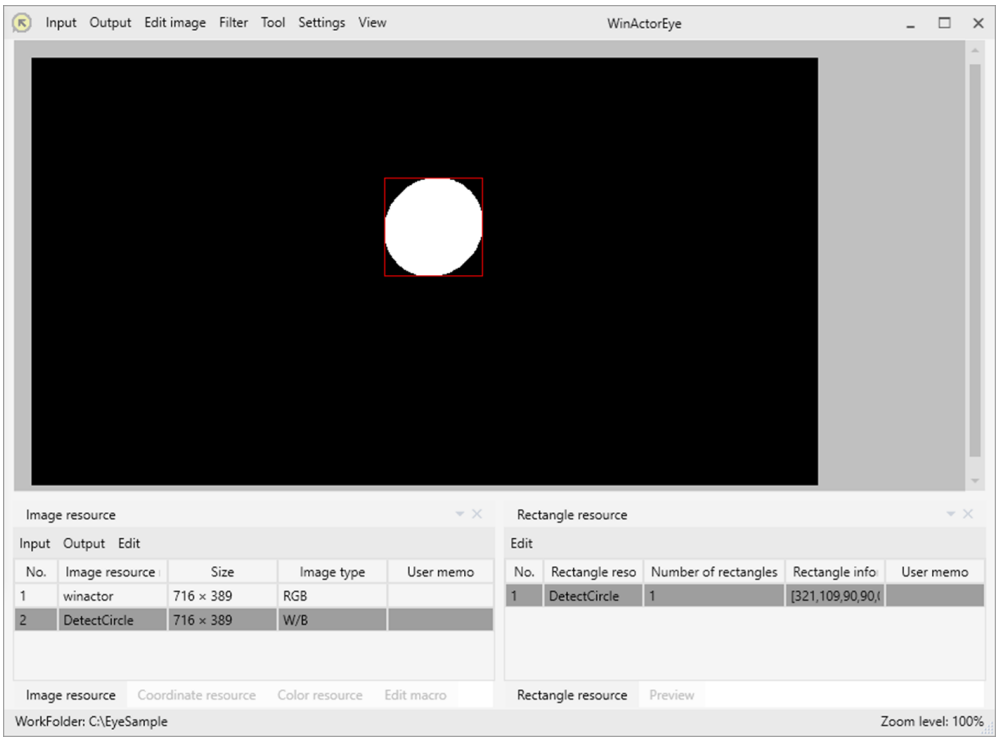


Figure 7-23. Example of executing "Detect circles"

Furthermore, by selecting the image resource specified in the step ① after executing "Detect circles," you can check the result with the rectangle information overlaid on the input image resource as shown in Figure 7-24. Example of executing "Detect circles" (with the rectangle information overlaid on the input image resource)

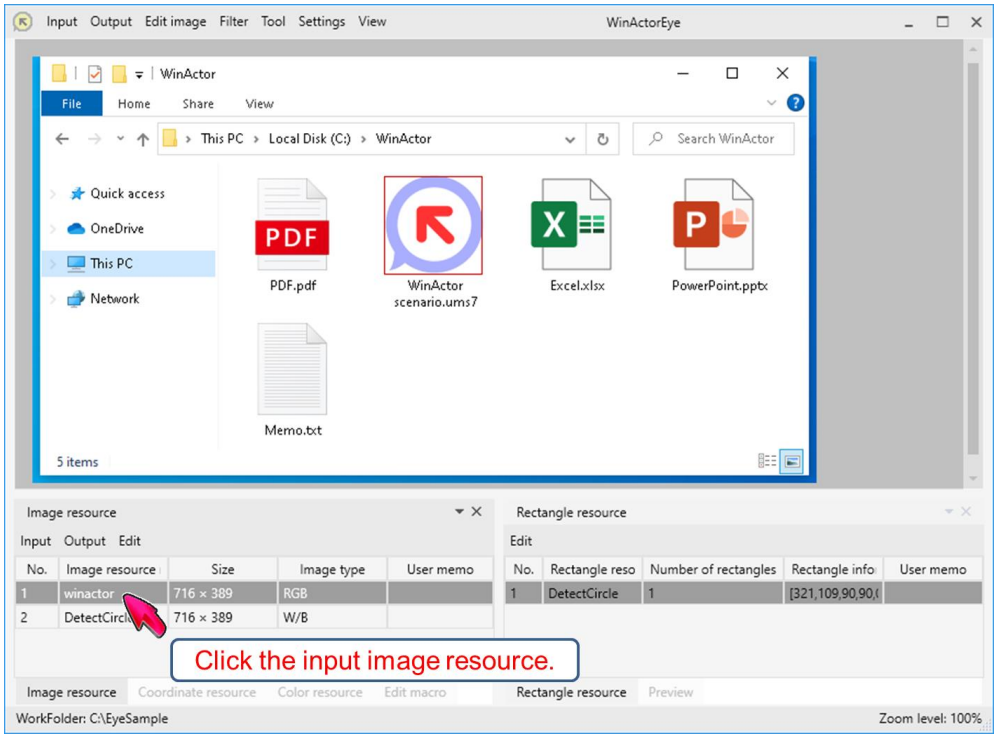


Figure 7-24. Example of executing "Detect circles" (with the rectangle information overlaid on the input image resource)

7.6 Search specified color

"Search specified color" is a function to search for areas with a color similar to the specified color resource on a specified image resource.

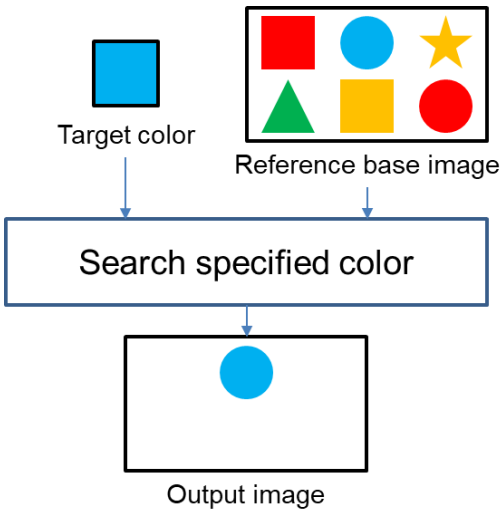


Figure 7-25. Search specified color

This is a matching function suitable for objects with distinctive colors compared to the surroundings, such as icons and UI.

Click "Search specified color" in the "Filter" menu to display the "Search specified color" window shown in Figure 7-26.

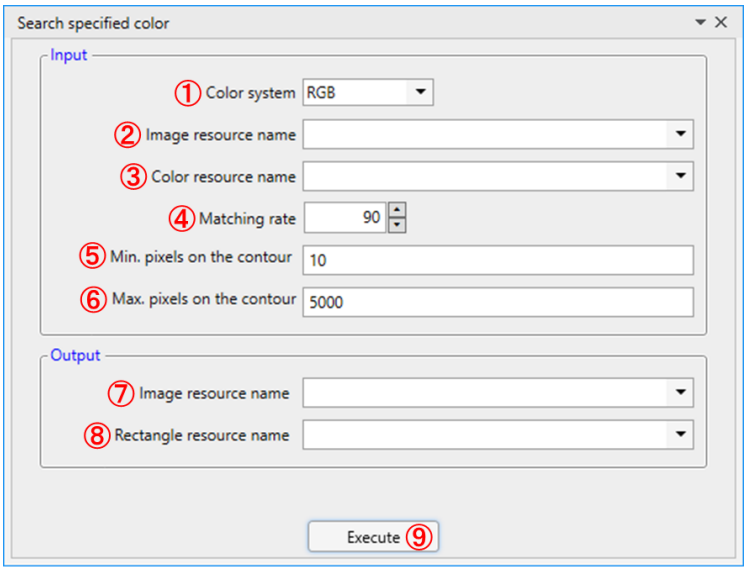


Figure 7-26. "Search specified color" window

The operation procedure of the "Search specified color" window is as follows.

Before using "Search specified color," it is necessary to register a color resource using "Color picker tool."

① Specify a color system. The matching result may differ depending on the specified color system.

Table 7-2. Color system options

No.	Color system	Description
1	RGB	A color system commonly used on computers.
2	HSV	A color system that expresses colors by hue, saturation, and brightness (value). Compared to RGB, it is useful when comparing bright colors.
3	Lab	A color system close to human perception. Compared to RGB, it is possible to compare colors that are closer to human perception.
4	YUV	A color system expressed by brightness and two color differences. Compared to RGB, it is more robust to changes in brightness.

② Specify an input image resource name.

③ Specify an input color resource name.

④ Set the matching rate. The larger the matching rate, the more accurately the specified color can be found.

⑤ Enter the minimum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour larger than this number will be output.

⑥ Enter the maximum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour smaller than this number will be output.

⑦ Specify an output image resource name.

⑧ Specify an output rectangle resource name.

⑨ Click the button to search the areas with the color similar to the specified color and register them in the image resource and in the rectangle resource based on the settings made in ① to ⑧.

After executing, the areas with the color similar to the specified color will be displayed in white in the image input area as shown in Figure 7-29. If there is no area with the color similar to the specified color, only the black background will be displayed.

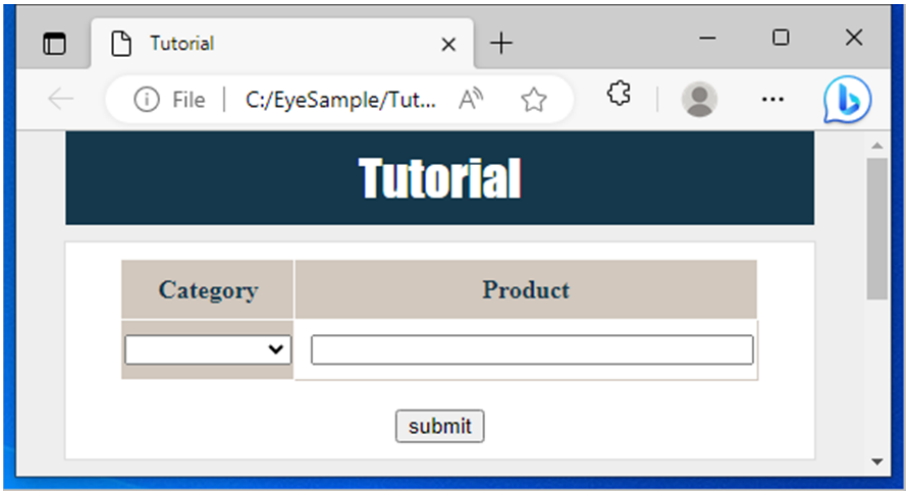


Figure 7-27. Input image

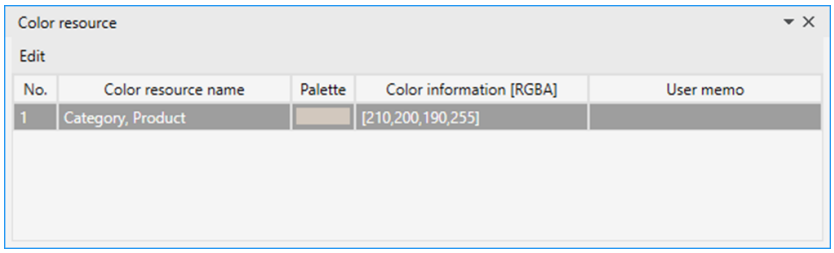


Figure 7-28. Specified color

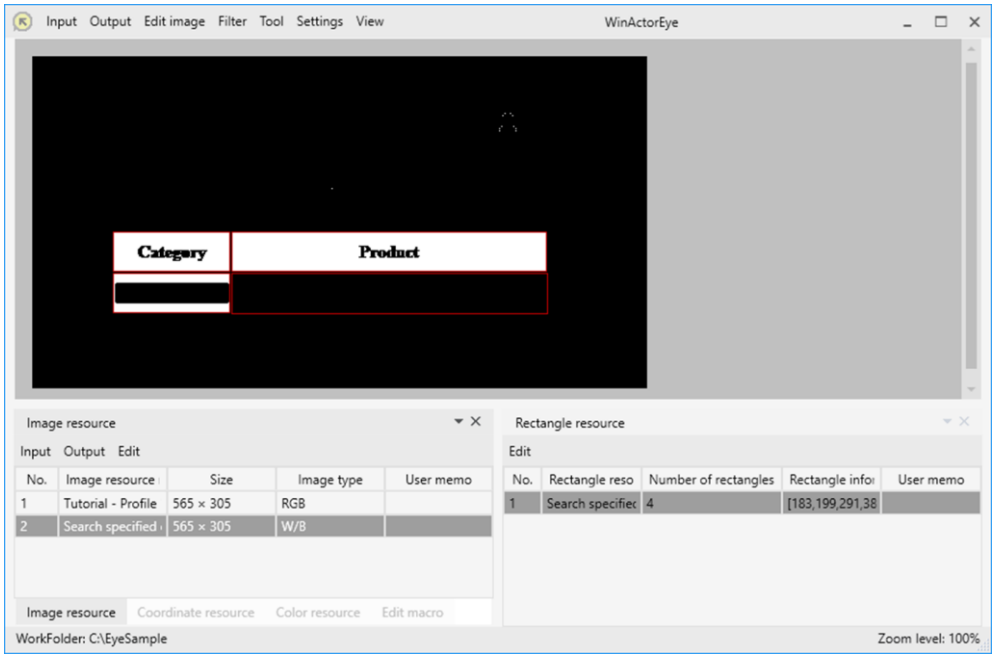


Figure 7-29. Example of executing "Search specified color"

Furthermore, by selecting the image resource specified in the step ① after executing "Search specified color," you can check the result with the rectangle information overlaid on the input image resource as shown in Figure 7-30.

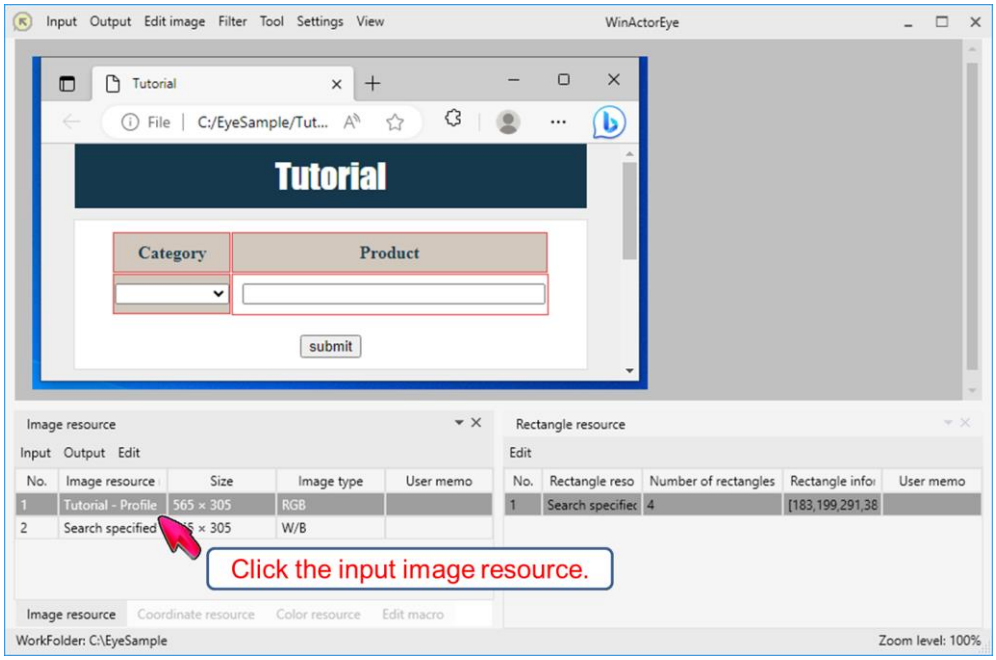


Figure 7-30. Example of executing "Search specified color" (with the rectangle information overlaid on the input image resource)

7.7 Boolean operation

"Boolean operation" is a function to output a common area or an entire area of an image resource output by the "Filter" function as shown in Figure 7-31.

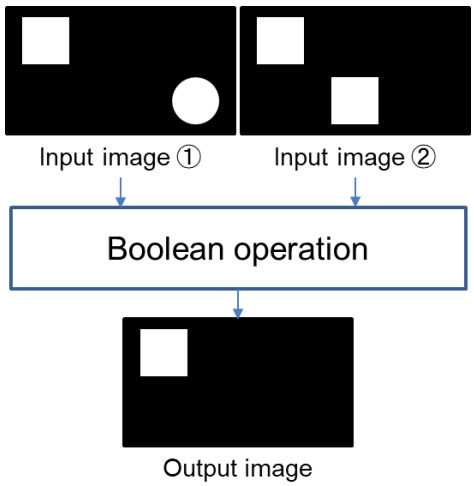


Figure 7-31. Boolean operation

Image resources consisting of **black** and **white** as shown in Figure 7-13 and Figure 7-18 are used as inputs, and a common white area or all white areas existing in two image resources will be acquired. It is mainly used to narrow down the matching results as shown in Figure 7-31.

Click "Boolean operation" in the "Filter" menu to display the "Boolean operation" window shown in Figure 7-32.

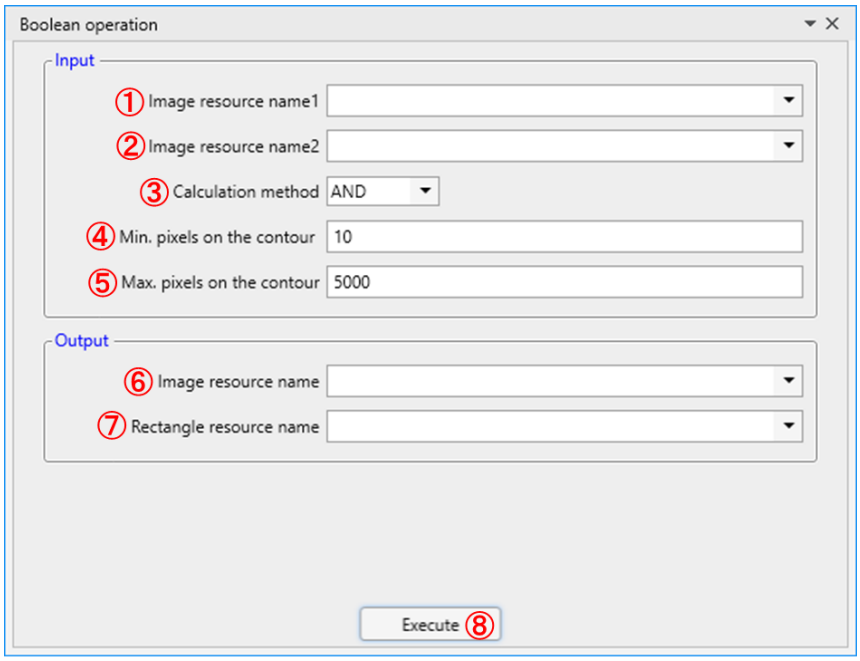


Figure 7-32. "Boolean operation" window

The operation procedure of the "Boolean operation" window is as follows.

① Specify a name of the first input image resource. For the image resource to be specified here, specify a black and white image resource that has been output by the "Filter" function.

② Specify a name of the second input image resource. For the image resource to be specified here, specify a black and white image resource that has been output by the "Filter" function.

③ Set the calculation method to AND or OR. When AND is set, the area common to the two image resources will be acquired. When OR is set, the entire area of the two image resources will be acquired.

④ Enter the minimum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour larger than this number will be output.

⑤ Enter the maximum number of pixels on the contour. For descriptions of the number of pixels on the contour, see "7.2.1 Number of pixels on a contour." A rectangle resource with the number of pixels on the contour smaller than this number will be output.

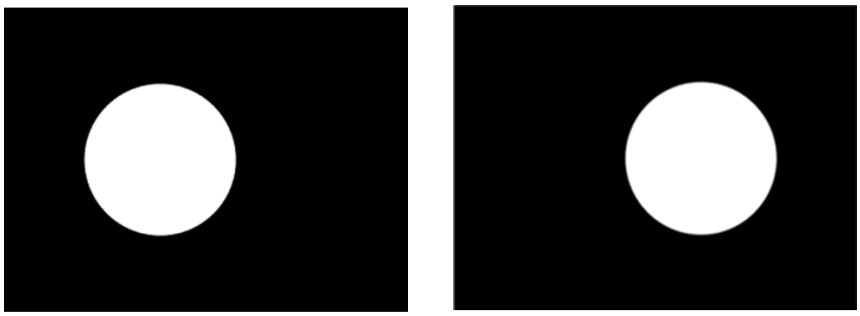
⑥ Specify an output image resource name.

⑦ Specify an output rectangle resource name.

⑧ Click the button to detect the common white area or all white areas based on the settings made in ① to ⑦.

For the input images ① and ② in Figure 7-33, Figure 7-34 shows an example of executing "Boolean operation" with AND set for the calculation method, and Figure 7-35 shows an example of executing "Boolean operation" with OR set for the calculation method.

If there is no common white area, only the black background will be displayed.



Input image ①　　Input image ②

Figure 7-33. Input images

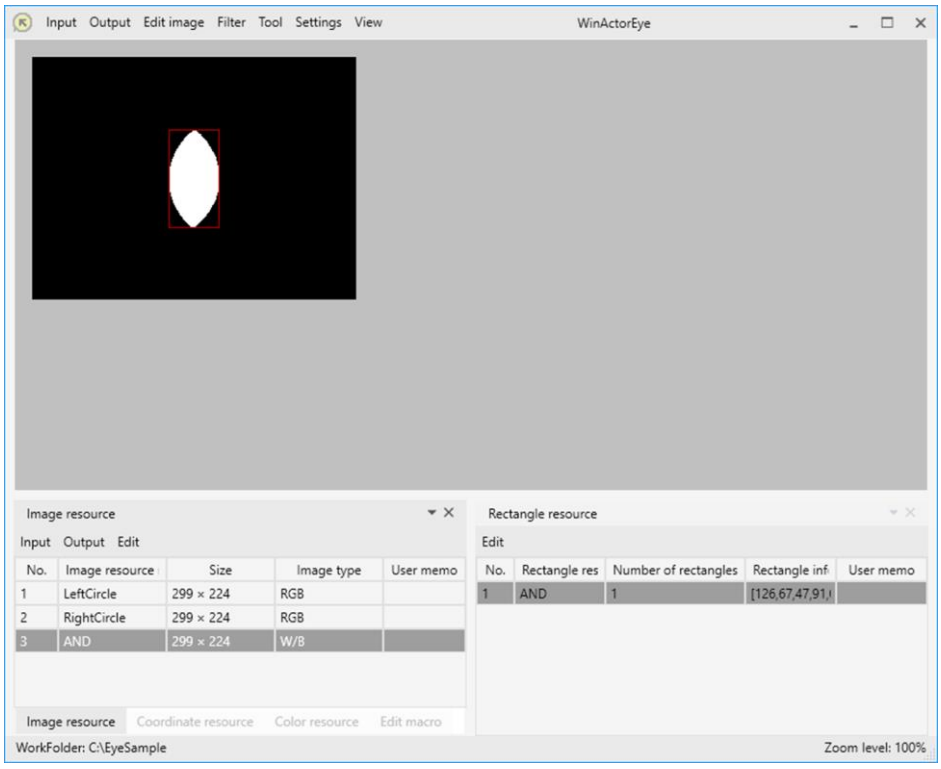


Figure 7-34. Example of executing "Boolean operation" (AND)

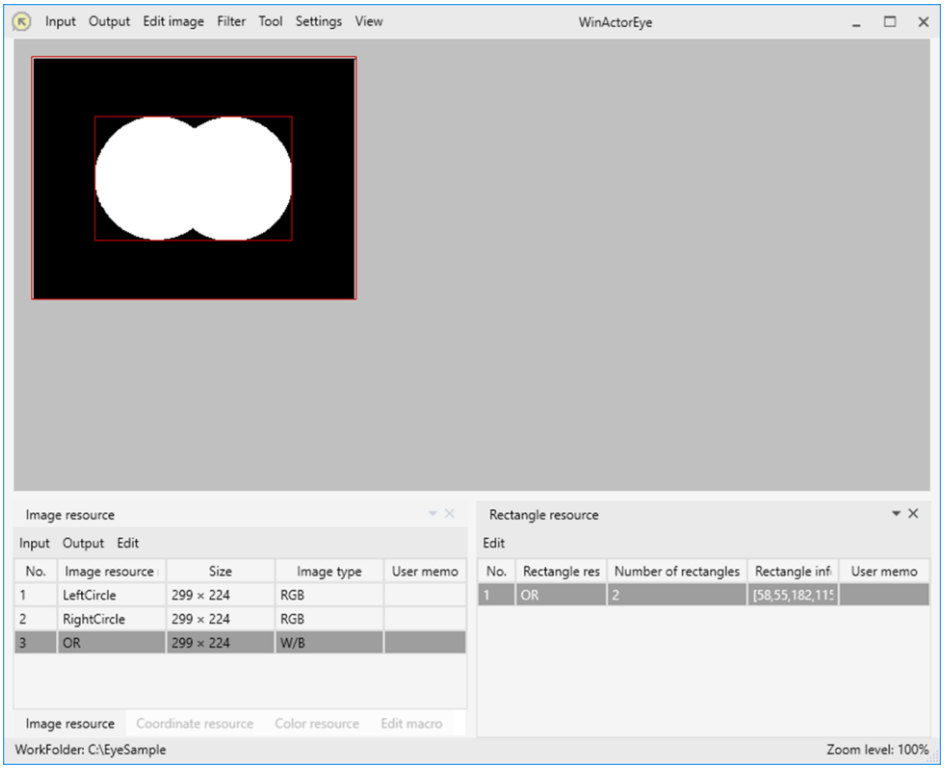


Figure 7-35. Example of executing "Boolean operation" (OR)

7.8 Selection algorithm

"Selection algorithm" is a function to narrow down rectangle information of a rectangle resource output by the "Filter" matching function. It is used to pick up a position for mouse action from a rectangle resource with information for multiple rectangles.

Click "Selection algorithm" in the "Filter" menu to display the "Selection algorithm" window shown in Figure 7-36. The input item changes depending on the item selected in the drop-down list of the Selection algorithm field.

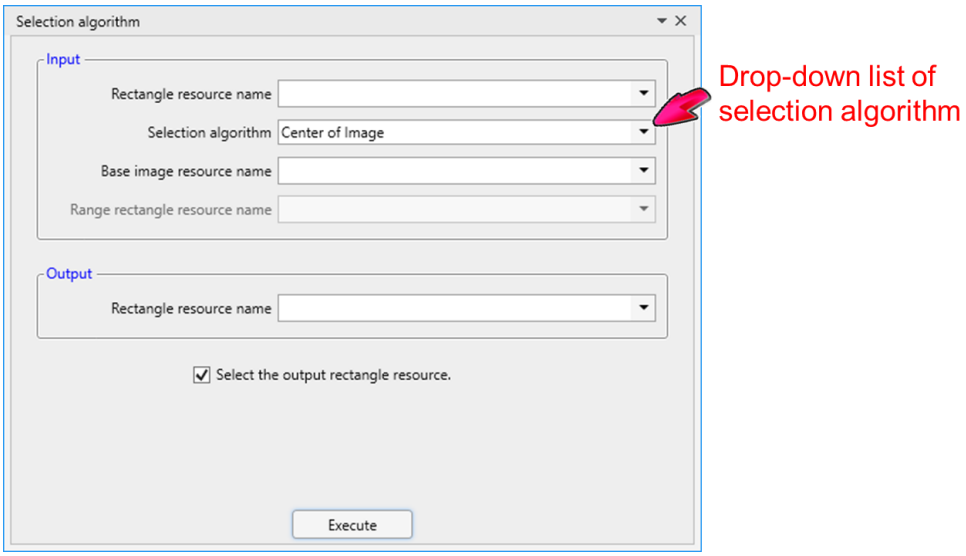


Figure 7-36. "Selection algorithm" window

Each of the following subsections describes the operation procedure with each item in the Selection algorithm drop-down list specified when executing "Selection algorithm" in the state shown in "Figure 7-37. Before executing "Selection algorithm."

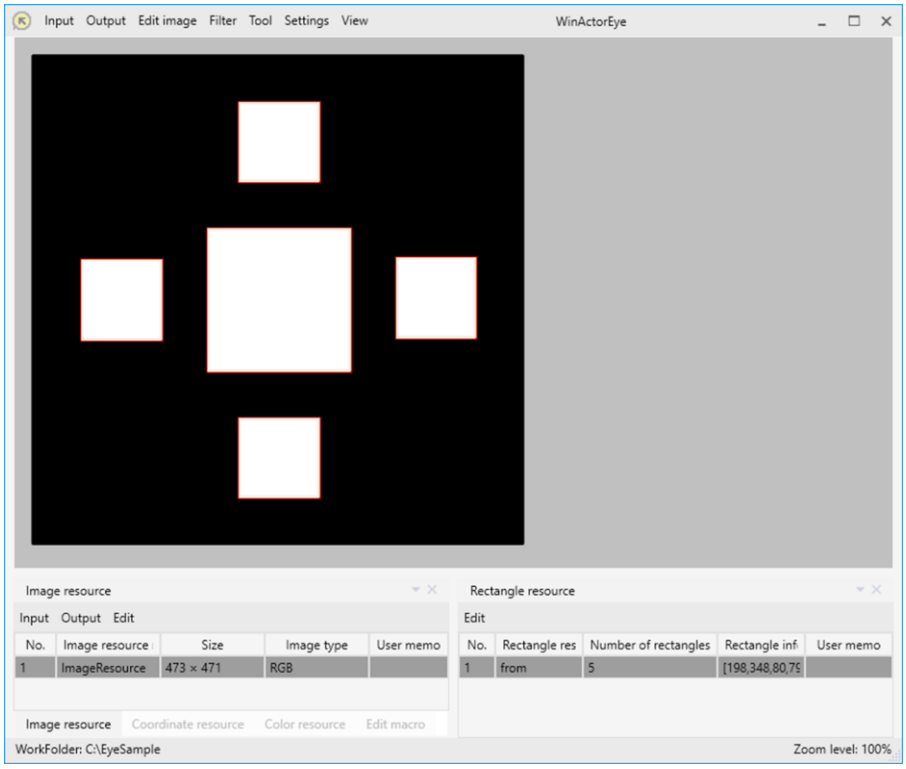


Figure 7-37. Before executing "Selection algorithm"

7.8.1 Center of image

"Center of image" is to select rectangle information whose center of the rectangle is closest to the center of a specified image resource. This is useful when a target of mouse action is near the center of a captured image.

Figure 7-38 shows the "Selection algorithm" window when "Center of image" is selected.

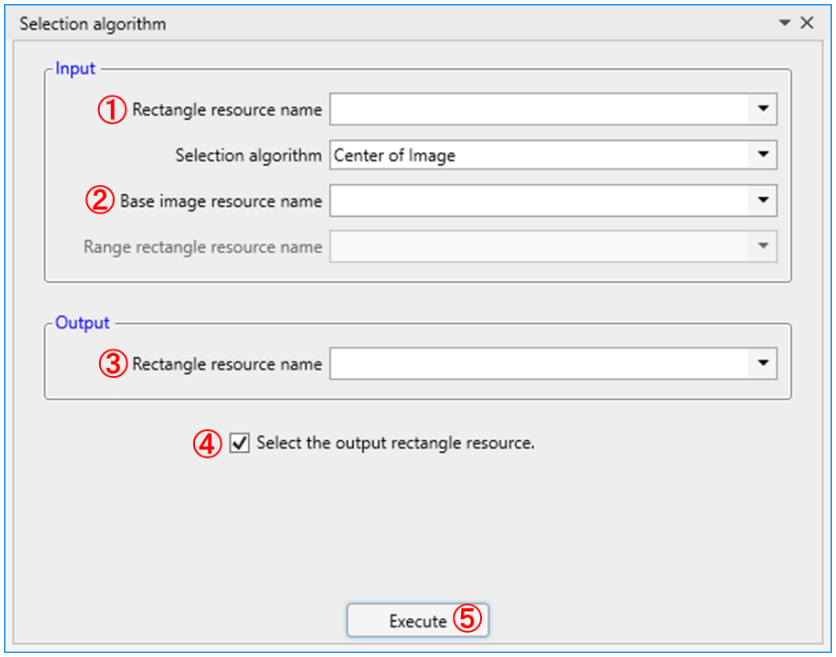


Figure 7-38. "Selection algorithm" window (Center of image)

The operation procedure when "Center of image" is selected is as follows.

① Specify a rectangle resource for executing "Selection algorithm."

② Specify a base image resource.

③ Specify a resource name for which rectangle information is to be output.

④ Check the box to set the registered rectangle resource to the selected state. (The resource will be displayed in the image input area.)

⑤ Click the button to execute and register the output rectangle information in the "Rectangle resource" pane based on the settings made in ① to ④.

Figure 7-39 shows the example of executing "Selection algorithm" with "Center of image" selected. The rectangle information in the center of the five pieces of rectangle information arranged in a cross is selected.

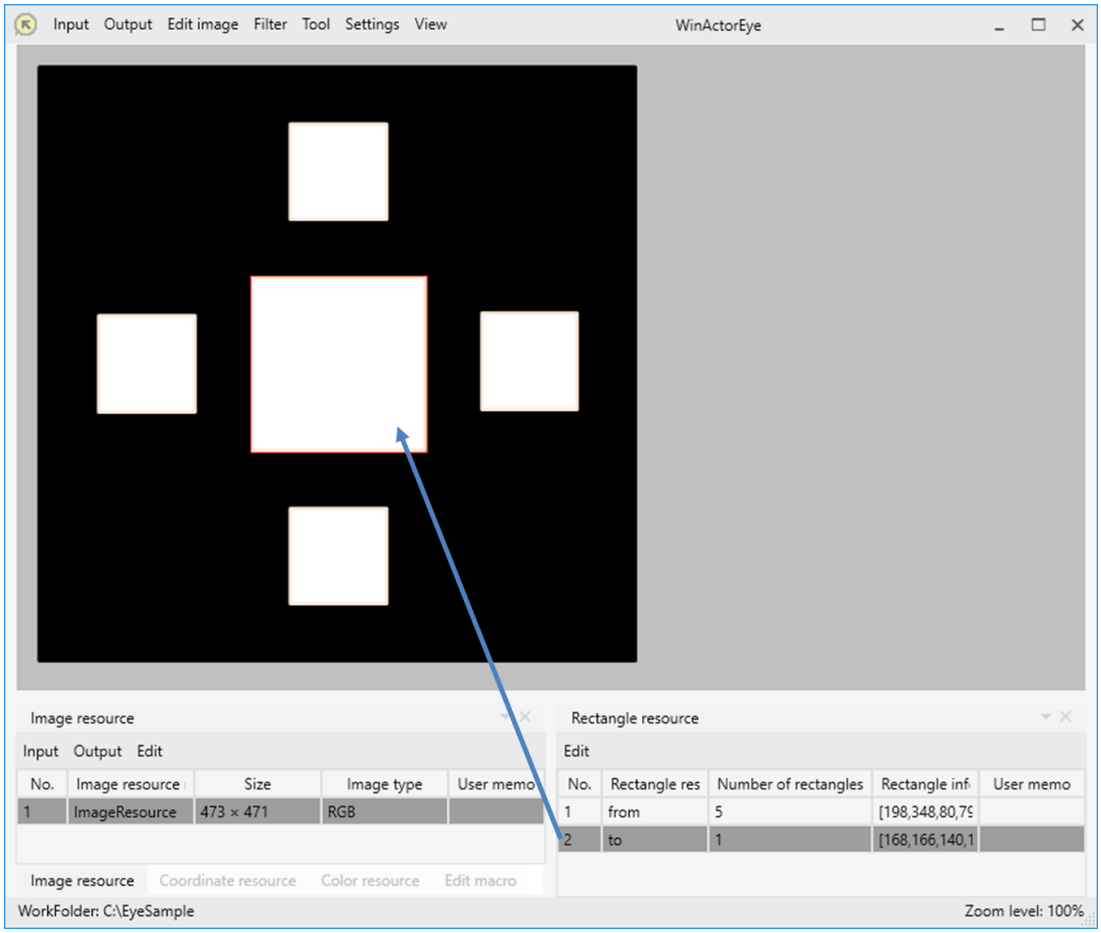


Figure 7-39. Example of executing "Selection algorithm" (Center of image)

7.8.2 Uppermost/Lowermost/Leftmost/Rightmost

"Uppermost," "Lowermost," "Leftmost," or "Rightmost" is to select rectangle information that exists at the uppermost, lowermost, leftmost, or rightmost of the rectangle information held by a rectangle resource. This is useful when a target of mouse action is on the edge of a captured image.

Figure 7-40 shows the "Selection algorithm" window when "Uppermost" is selected. The input items in the window will be the same when "Lowermost," "Leftmost," or "Rightmost" is selected.

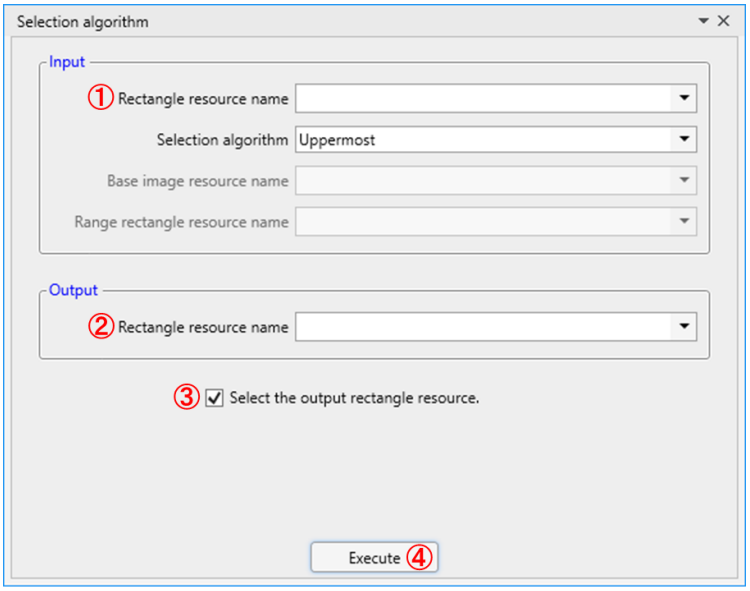


Figure 7-40. "Selection algorithm" window (Uppermost)

The operation procedure when "Uppermost" is selected is as follows. The same operation procedure applies when "Lowermost," "Leftmost," or "Rightmost" is selected.

① Specify a rectangle resource for executing "Selection algorithm."

② Specify a resource name for which rectangle information is to be output.

③ Check the box to set the registered rectangle resource to the selected state. (The resource will be displayed in the image input area.)

④ Click the button to execute and register the output rectangle information in the "Rectangle resource" pane based on the settings made in ① to ③.

Figure 7-41 shows an example of executing "Selection algorithm" with "Uppermost" selected. The rectangle information at the uppermost of the five pieces of rectangle information arranged in a cross is selected.

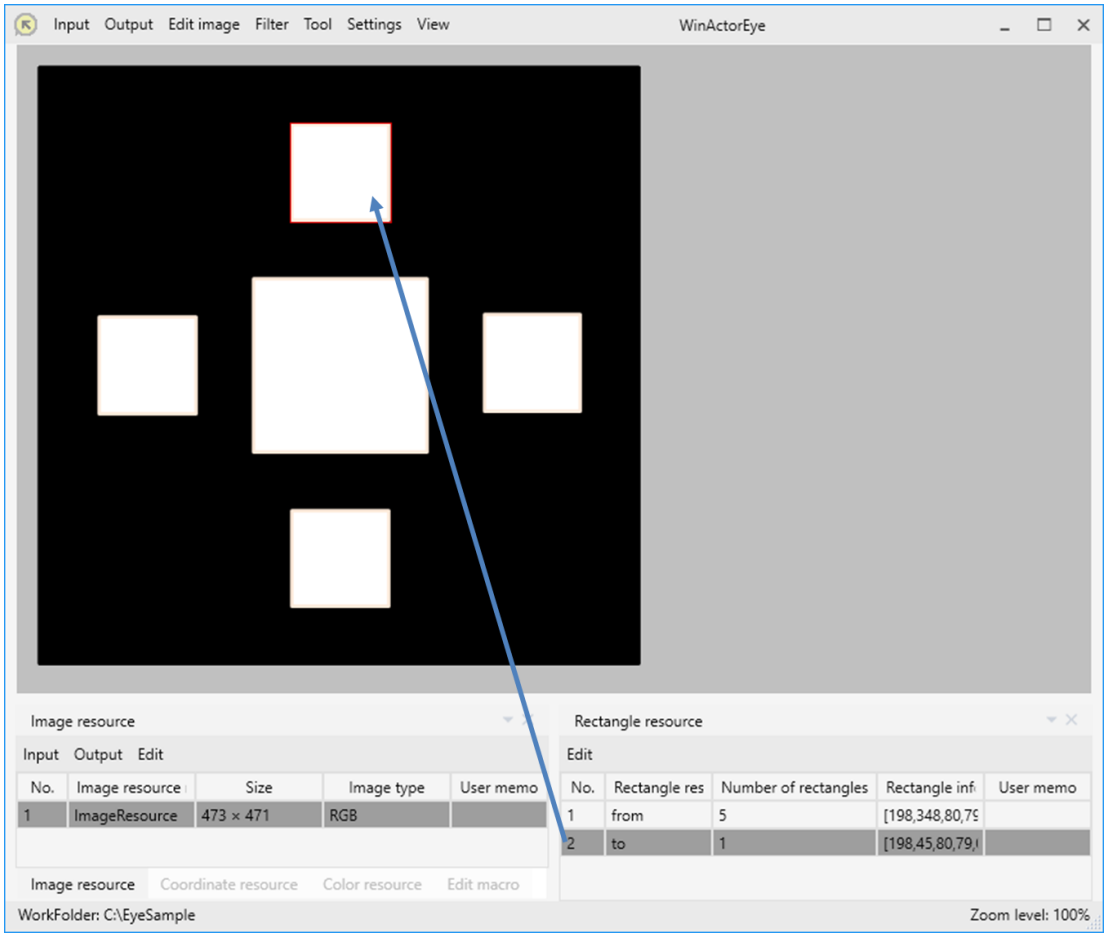


Figure 7-41. Example of executing "Selection algorithm" (Uppermost)

7.8.3 Largest/Smallest

"Largest" or "Smallest" is to select rectangle information with the largest or the smallest area in the rectangle information held by a rectangle resource. This is useful when a target of mouse action is the largest or the smallest area in a captured image.

Figure 7-42 shows the "Selection algorithm" window when "Largest" is selected. The input items in the window will be the same when "Smallest" is selected.

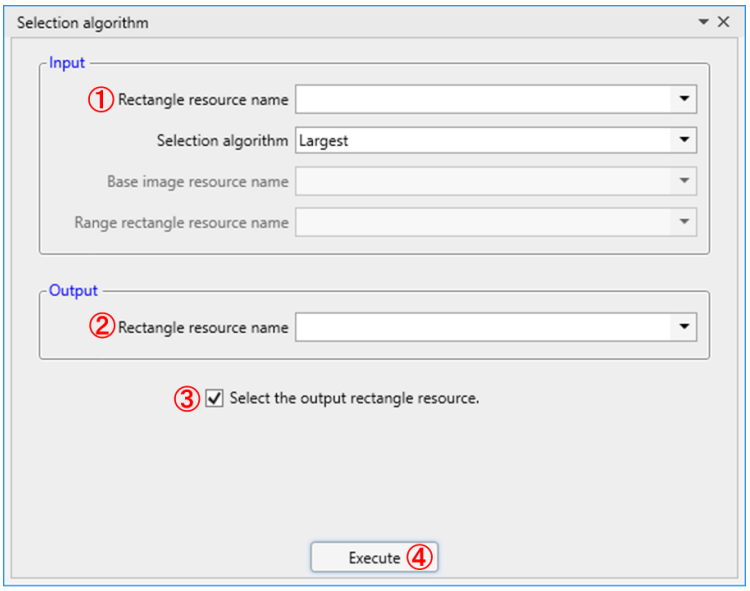


Figure 7-42. "Selection algorithm" window (Largest)

The operation procedure when "Largest" is selected is as follows. The same operation procedure applies when "Smallest" is selected.

① Specify a rectangle resource for executing "Selection algorithm."

② Specify a resource name for which rectangle information is to be output.

③ Check the box to set the registered rectangle resource to the selected state. (The resource will be displayed in the image input area.)

④ Click the button to execute and register the output rectangle information in the "Rectangle resource" pane based on the settings made in ① to ③.

Figure 7-43 shows an example of executing "Selection algorithm" with "Largest" selected. The rectangle information with the largest area in the five pieces of rectangle information arranged in a cross is selected.

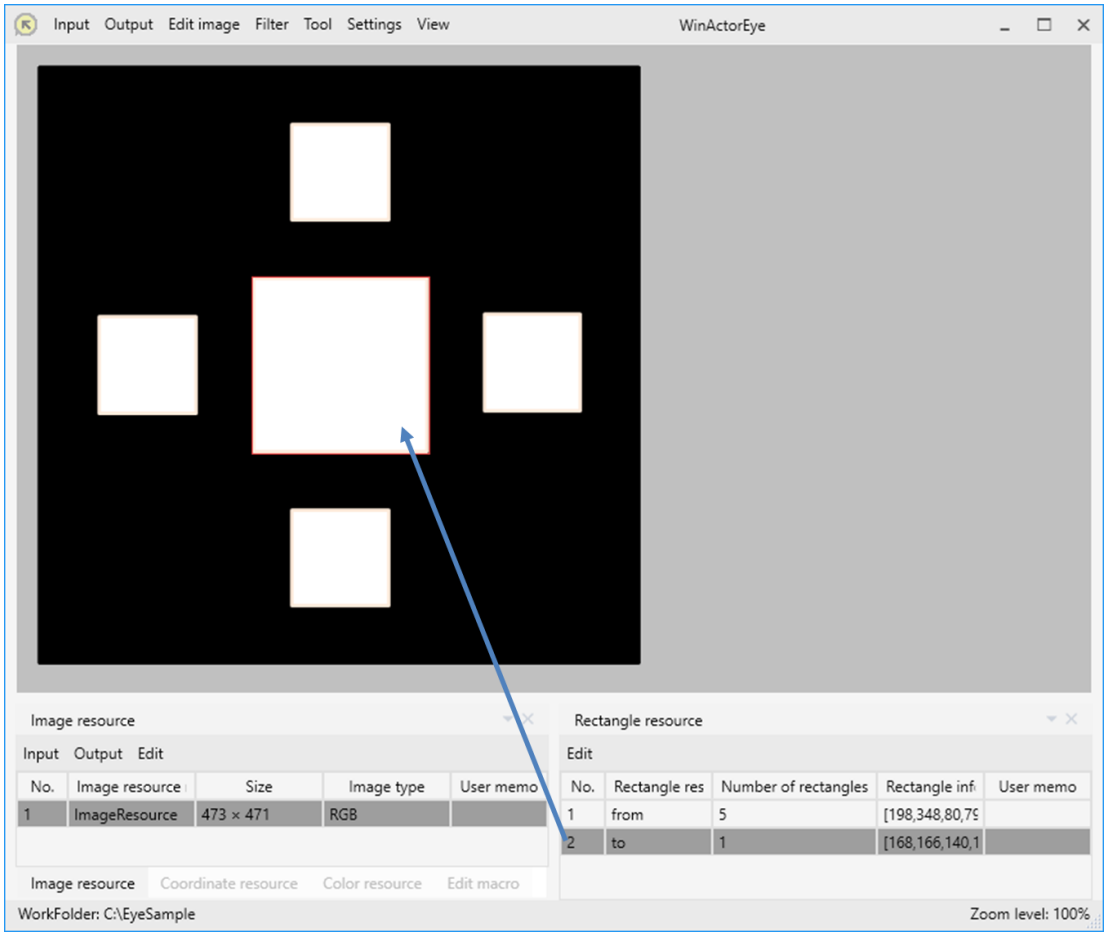


Figure 7-43. Example of executing "Selection algorithm" (Largest)

7.8.4 Rectangles within range

"Rectangles within range" is to select rectangle information existing in a range specified by a rectangle resource for specifying a range. Unlike "7.8.1 Center of image," "7.8.2 Uppermost/Lowermost/Leftmost/Rightmost," and "7.8.3 Largest/Smallest," all rectangle information existing in the specified range will be selected. This is useful when there are multiple targets for mouse action within a specific range.

Figure 7-44 shows the "Selection algorithm" window when "Rectangles within range" is selected.

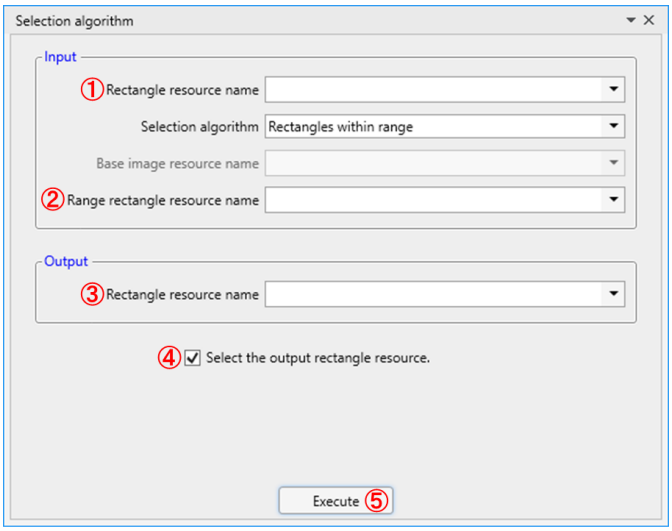


Figure 7-44. "Selection algorithm" window (Rectangles within range)

The operation procedure when "Rectangles within range" is selected is as follows.

① Specify a rectangle resource for executing "Selection algorithm."

② Specify a rectangle resource for specifying a range. Figure 7-45 shows an example of registering a rectangle resource with three pieces of rectangle information vertically enclosed. For how to register a rectangle resource on the main window, see "3.3.2 Registering a rectangle resource."

③ Specify a resource name for which the rectangle information is to be output.

④ Check the box to set the registered rectangle resource to the selected state. (The resource will be displayed in the image input area.)

⑤ Click the button to execute and register the output rectangle information in the "Rectangle resource" pane based on the settings made in ① to ④.

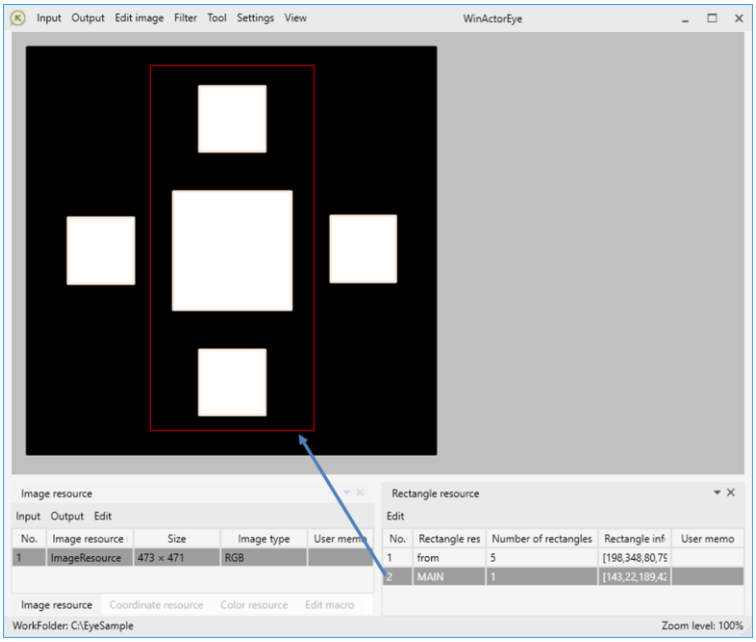


Figure 7-45. Registering a rectangle resource for specifying a range

Figure 7-46 shows an example of executing "Selection algorithm" with "Rectangles within range" selected. The three pieces of rectangle information arranged vertically in the five pieces of rectangle information arranged in a cross are selected.

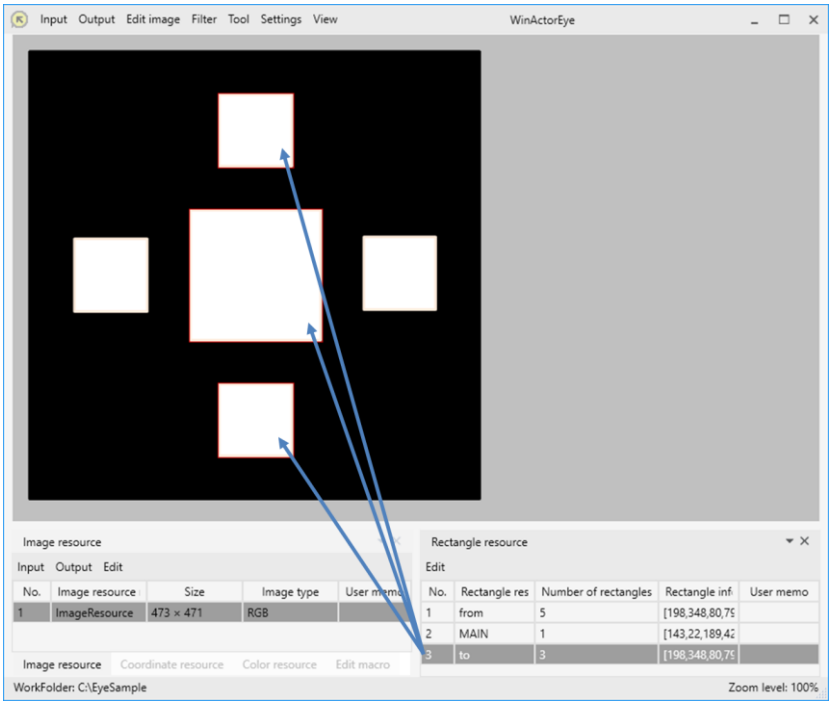


Figure 7-46. Example of executing "Selection algorithm" (Rectangles within range)

7.9 Extract coordinates from rectangle

"Extract coordinates from rectangle" is a function to extract coordinates of a specified extraction location in a specified rectangle resource and register the coordinate information in the "Coordinate resource" pane as shown in Figure 7-47.

This is a required function for mouse actions to be performed when creating a WinActorEye macro as it is necessary to pass the coordinate information to WinActor as shown in "Figure 2-1. Relationship diagram between WinActorEye and WinActor. Relationship diagram between WinActorEye and WinActor."

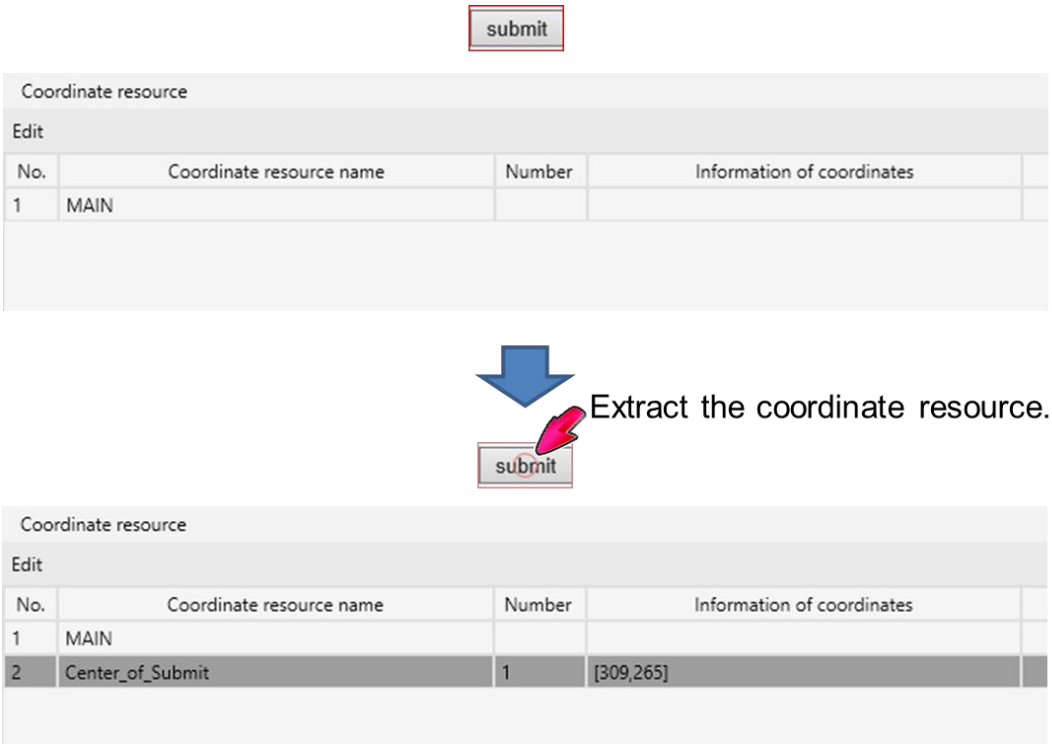


Figure 7-47. Extracting coordinates from the rectangle

Click "Extract coordinates from rectangle" in the "Filter" menu to display the "Extract coordinates from rectangle" window shown in Figure 7-48.

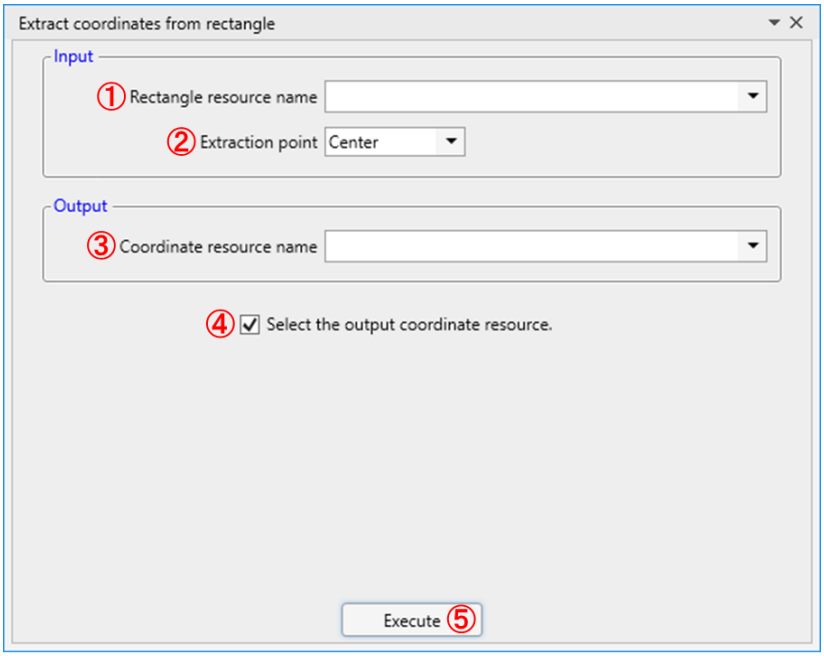


Figure 7-48. "Extract coordinates from rectangle" window

The operation procedure of the "Extract coordinates from rectangle" window is as follows.

① Specify an input rectangle resource name.

② Select an extraction point you want to extract coordinates from the rectangle information. For the selection items in the drop-down list of the extraction point field, see "Table 7-3. List of rectangle coordinates extraction points."

③ Specify an output coordinate resource name.

④ Check the box to set the registered coordinate resource to the selected state. (The resource will be displayed in the image input area.)

⑤ Click the button to extract the coordinates and register the coordinate resource based on the settings made in ① to ④.

Table 7-3. List of rectangle coordinates extraction points

No.	Selection item	Rectangle coordinates extraction point
1	Center	Extracts coordinates of the center of a rectangle. * If the center coordinates include a decimal point, the value with decimals truncated will be the extraction result. (Example: 14.5 -> 14)
2	Upper left	Extracts coordinates of the upper left corner of a rectangle.
3	Lower left	Extracts coordinates of the lower left corner of a rectangle.
4	Upper right	Extracts coordinates of the upper right corner of a rectangle.
5	Lower right	Extracts coordinates of the lower right corner of a rectangle.

8 Tool

8.1 Tool menu

The Tool menu has functions for processing an image using various resources of WinActorEye.

Click "Tool" on the menu bar to display its functions as shown in "Figure 8-1. Tool menu" below.

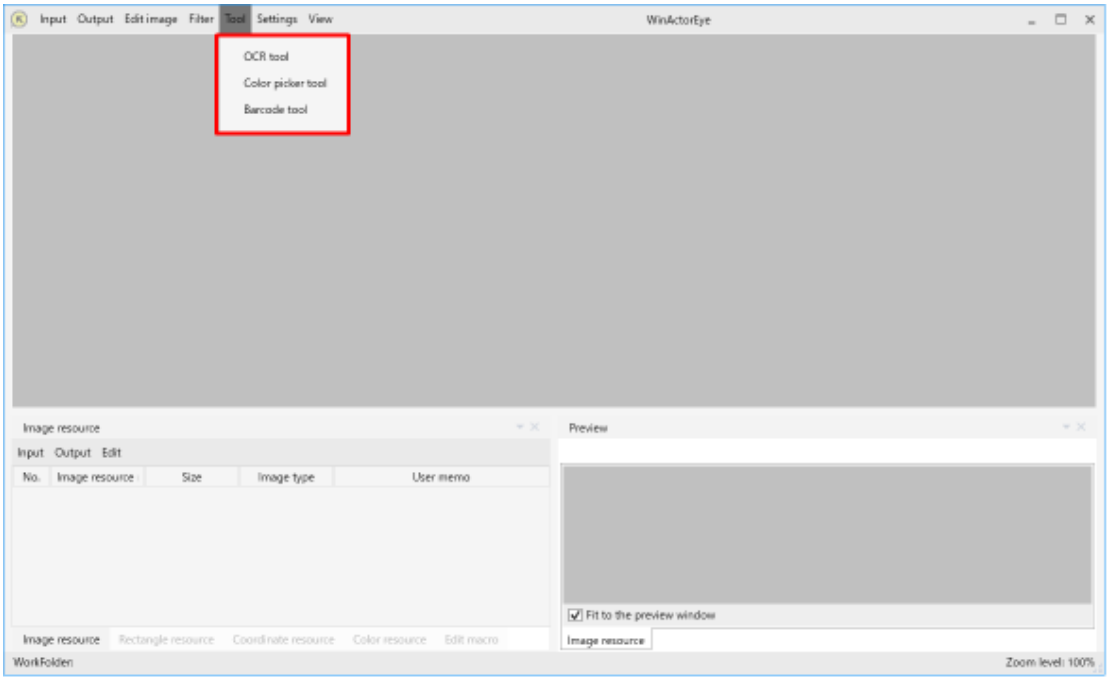


Figure 8-1. Tool menu

Table 8-1. Tool menu

No.	Function	Description
1	OCR tool	Displays the "OCR tool" window. For details, see "8.2 OCR tool."
2	Color picker tool	Displays the "Color picker tool" window. For details, see "8.3 Color picker tool."
3	Barcode tool	Displays the "Barcode tool" window. For details, see "8.4 Barcode tool."

8.2 OCR tool

"OCR tool" is a function that calls an external OCR tool and gets character information and its rectangle information from an image. Click "OCR tool" in the "Tool" menu shown in Figure 8-1 to display the "OCR tool" window.

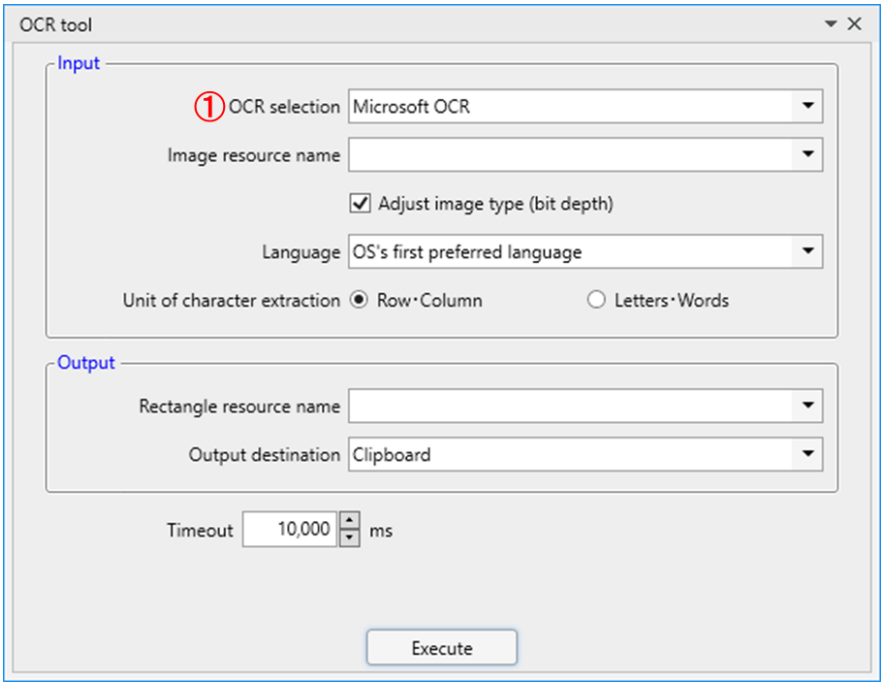


Figure 8-2. "OCR tool" window

The external OCR tool that can be selected with "OCR tool" is as follows.

Table 8-2. Selectable external OCR tool

No.	External OCR tool	Description
1	Microsoft OCR	For details, see "8.2.1 Microsoft OCR."

8.2.1 Microsoft OCR

Microsoft OCR is available. Note that WinActorEye does not guarantee the operation because the character extraction accuracy and the accuracy of the rectangle information about the character position depend on Microsoft OCR.

Therefore, this function is provided as a sample.

For specific usage examples, see "WinActorEye Scenario Creation Manual."

8.2.1.1 "OCR tool" window operation procedure

The operation procedure of the "OCR tool" window is as follows.

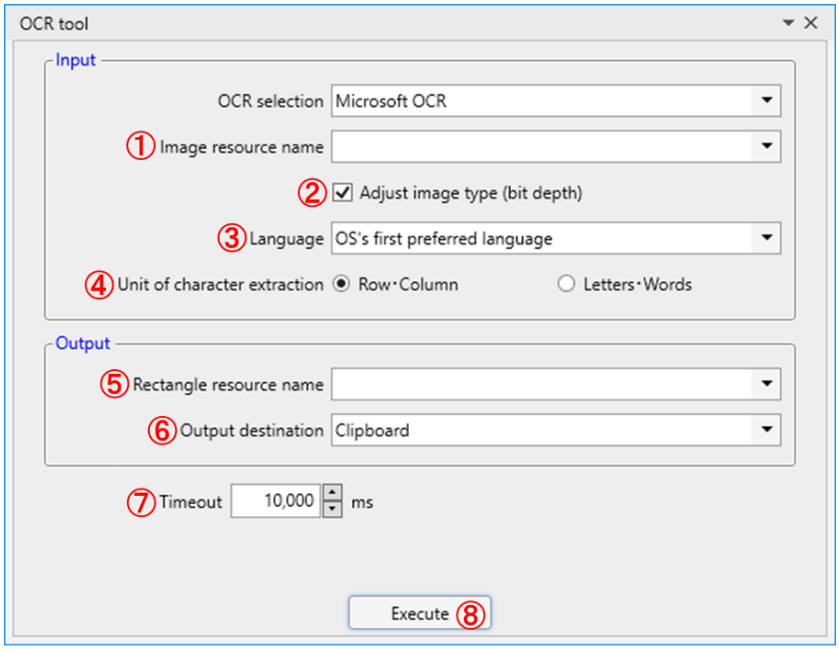


Figure 8-3. "OCR tool" window

① Specify an input image resource name. Characters and character position information will be acquired for the image specified here.

② Check the box to adjust the image type (bit depth) automatically.

③ Set the language of characters to be acquired by OCR. The descriptions in Table 8-3 are for reference only and may not apply in some cases.

Table 8-3. Output language

No.	Selection item	Description
1	OS's first preferred language	The language with the highest priority in the language settings of Windows will be the output language of OCR.
2	English	English will be the output language of OCR.
3	Japanese	Japanese will be the output language of OCR.

* There are conditions for the specified language setting to be valid. See "8.2.1.2 Windows language settings and Microsoft OCR language."
* When the output language of OCR is English, the characters arranged vertically will not be detected.

④ Select the OCR character extraction unit. The descriptions in Table 8-4 are for reference only and may not apply in some cases.

Table 8-4. Character extraction unit

No.	Selection item	Description
1	Row・Column	A character string that is grouped vertically or horizontally will be extracted.
2	Letters・Words	One character for Japanese and a grouped character string for English and numbers will be extracted.

⑤ Specify an output rectangle resource name. The coordinate information of the rectangle surrounding each character or character string will be output to the rectangle resource specified here.

⑥ Select an output destination of the character data extracted from the image.

Table 8-5. Character data output destination

No.	Selection item	Description
1	Clipboard	Character data will be output to the clipboard. For example, after running this tool, you can display the output characters by selecting [Edit] > [Paste] in Notepad. It will be the character data with line breaks in the unit of extracted characters and character strings.

⑦ Set the timeout value. If the processing takes longer than the time specified here, the processing will be canceled.

⑧ Click the button to extract the character information from the specified image and output the coordinate information surrounding the character to the specified rectangle resource based on the settings made in ① to ⑦.

8.2.1.2 Windows language settings and Microsoft OCR language

The following describes the case of Windows 10 English (United States) version as an example.

If "Japanese" in Table 8-3 is selected and the Japanese language pack is not installed, the setting will be invalid (it will be processed in the OS first preferred language). To use "Japanese" as the language for Microsoft OCR, install the Japanese language pack in advance.

When "OS first preferred language" in Table is selected, if English (United States) and Japanese are listed as the language settings in Windows, the language at the top of the list will be the OCR output language.

For the actual operation of the Windows language settings, see the Windows manual.

8.3 Color picker tool

"Color picker tool" is a function for getting color information from specified coordinates on an image. This is used when registering a color resource required for the function that inputs color information.

Click "Color picker tool" in the "Tool" menu (Figure 8-1) to display the "Color picker tool" window.

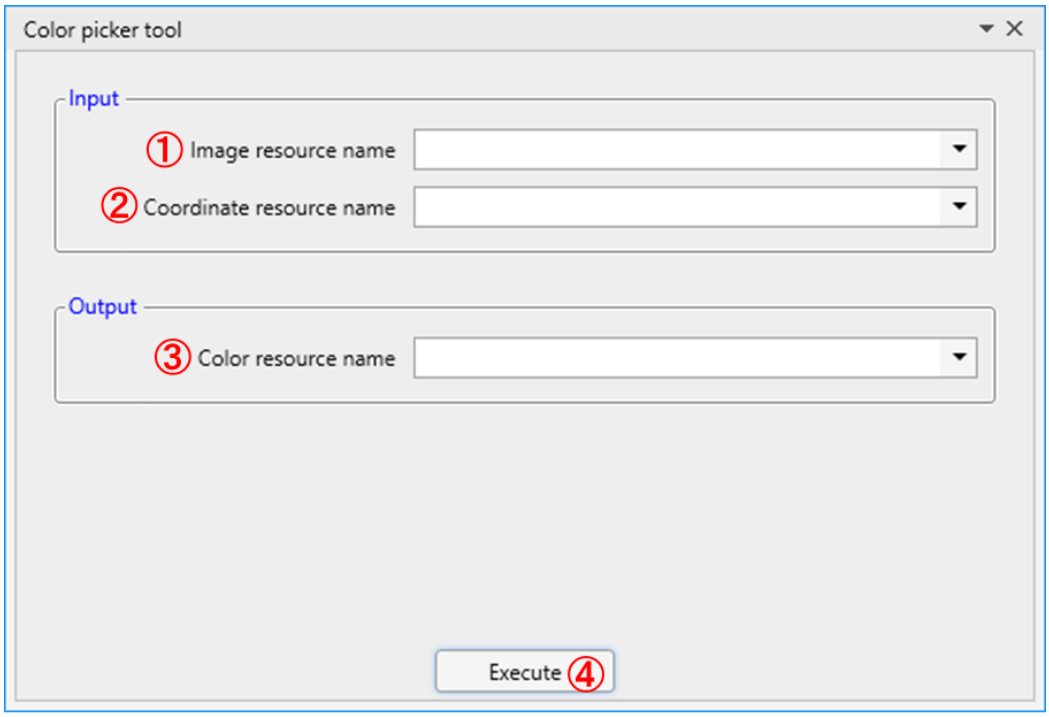


Figure 8-4. "Color picker tool" window

① Specify an input image resource name.

② Specify an input coordinate resource name. Color information will be extracted based on the coordinate information specified here.

③ Specify an output color resource name. The extracted color information will be output to the color resource specified here.

④ Click the button to extract the color information from the specified position of the specified image and output as a color resource based on the settings made in ① to ③.

8.4 Barcode tool

"Barcode tool" provides a function to use ZXing, which reads and writes a QR code or barcode.

The accuracy of reading and writing a QR code or barcode and the conformance to standards such as ISO or JIS depend on ZXing.

Click "Barcode tool" in the "Tool" menu (Figure 8-1) to display the "Barcode tool" window.

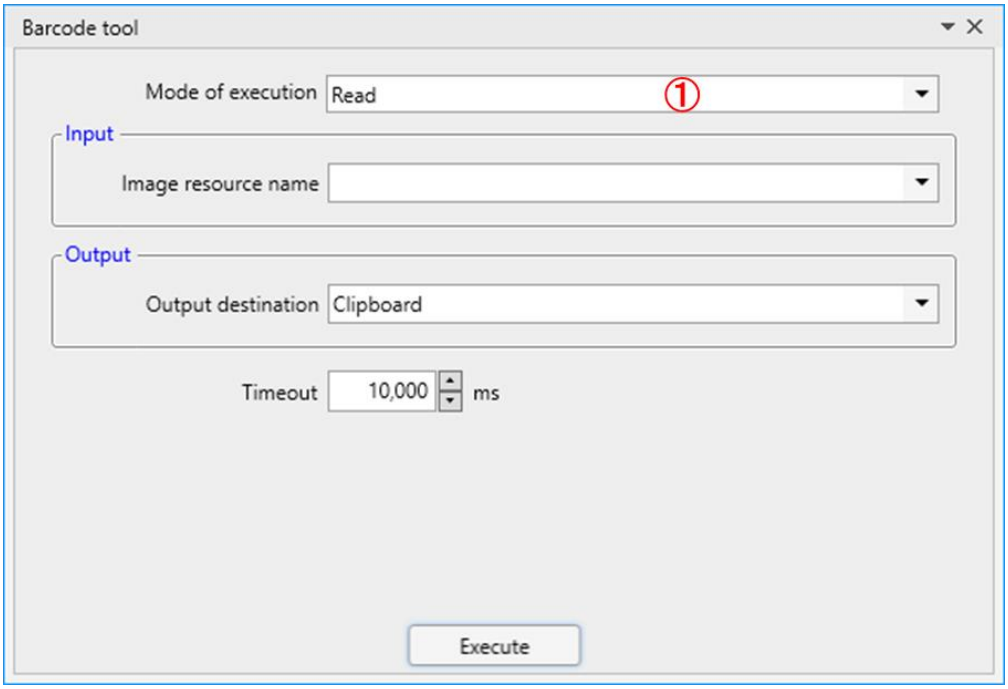


Figure 8-5. "Barcode tool" window

You can switch between "Read" and "Write" by clicking ① in Figure 8-5.

QR codes and barcodes that can be read or written are as follows. When using a QR code or barcode written with this tool, make sure that it can be read correctly with this tool before using it.

Table 8-6. Supported QR codes and barcodes

Type		Available characters	Number of characters	Remarks
QR code		(*1)(*3)	(*1)	You can specify a character encoding when writing
Barcode	EAN-8	Numbers (0 to 9) only	8	(*2)
	EAN-13	Numbers (0 to 9) only	13	(*2)
	ITF	Numbers (0 to 9) only	Up to 80, Even number	-
	CODE39	ASCII characters (*3)	Up to 80 (*4)	-
	CODE93	ASCII characters (*3)	Up to 80 (*5)	-
	CODE128	ASCII characters (*3)	Up to 80	-

(*1) Use within the range that does not cause an error with this tool.
(*2) For the first digit (right end), the function to automatically calculate and replace check digits is available when writing.
(*3) Control characters (0x00 to 0x1F, 0x7F) cannot be used.
(*4) This is the upper limit for strings consisting only of numbers (0 to 9), alphabets (A to Z), and symbols (-, ., SP). If you use ASCII characters other than the above, the upper limit will be lower.
(*5) This is the upper limit for strings consisting only of numbers (0 to 9), alphabets (A to Z), and symbols (-, ., SP, $, /, +, %). If you use ASCII characters other than the above, the upper limit will be lower.

8.4.1 Read

The operation procedure is as follows. To read, select "Read" in ① on the window shown in Figure 8-5.

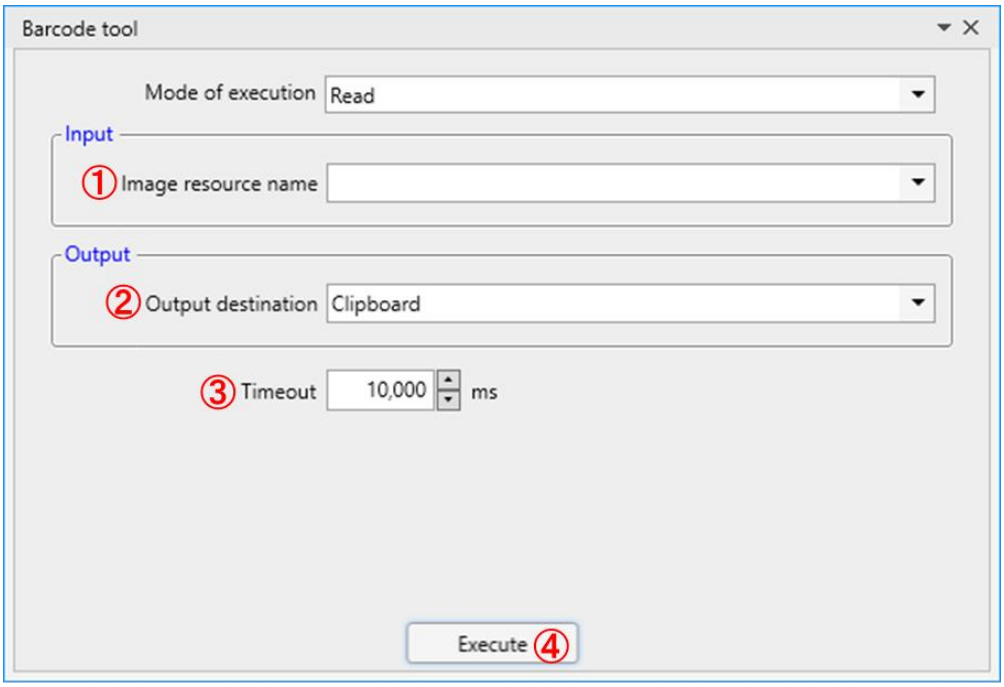


Figure 8-6. "Barcode tool" window (Read)

① Specify an input image resource name. Character data will be read from a QR code or barcode for the image specified here.

② Select an output destination of the character data extracted from the image.

Table 8-7. Character data output destination

No.	Selection item	Description
1	Clipboard	Character data will be output to the clipboard. For example, after running this tool, you can display the output characters by selecting [Edit] > [Paste] in Notepad.

③ Set the timeout value. If the processing takes longer than the time specified here, the processing will be canceled.

④ Click the button to output the character data from the specified image to the destination specified in ② based on the settings made in ① to ③.

8.4.2 Write

To write a QR code or barcode, select "Write" in ① on the window shown in Figure 8-5. Next, select "QRcode" or "Barcode" in ① on the window shown in Figure 8-7.

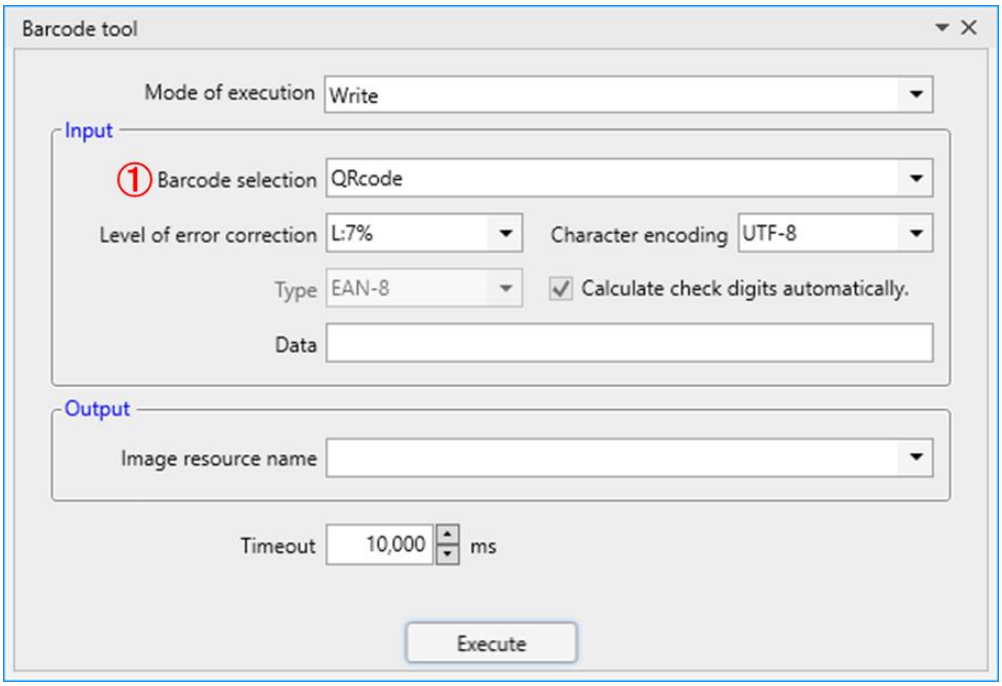


Figure 8-7. "Barcode tool" window (Write)

8.4.2.1 QR code

The operation procedure is as follows. To write a QR code, select "QRcode" in ① on the window shown in Figure 8-7.

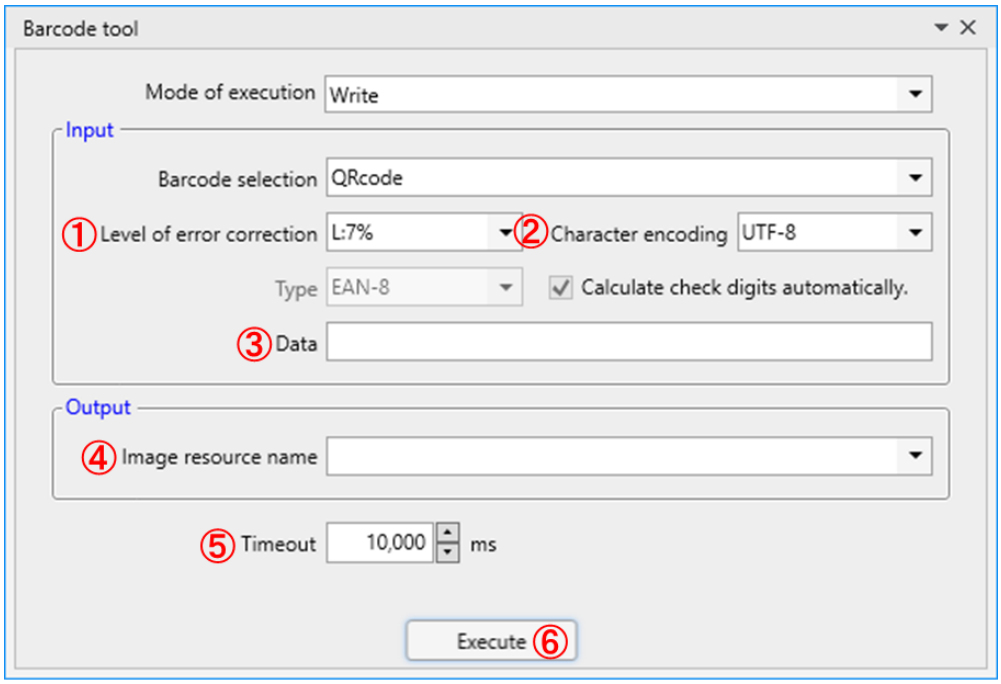


Figure 8-8. "Barcode tool" window (writing a QR code)

① Specify a level at which data can be restored when a code cannot be read (Level of error correction). The larger the number, the more data can be restored, but the amount of data will increase accordingly.

② Specify a character encoding of the QR code.

③ Specify data to make the QR code. For valid input values, see Table 8-6.

④ Specify "Image resource name" to which the QR code will be output.

⑤ Set the timeout value. If the processing takes longer than the time specified here, the processing will be canceled.

⑥ Click the button to output the QR code to the image resource specified in ④ based on the settings made in ① to ⑤.

8.4.2.2 Barcode

The operation procedure is as follows. To write a barcode, select "Barcode" in ① on the window shown in Figure 8-7.

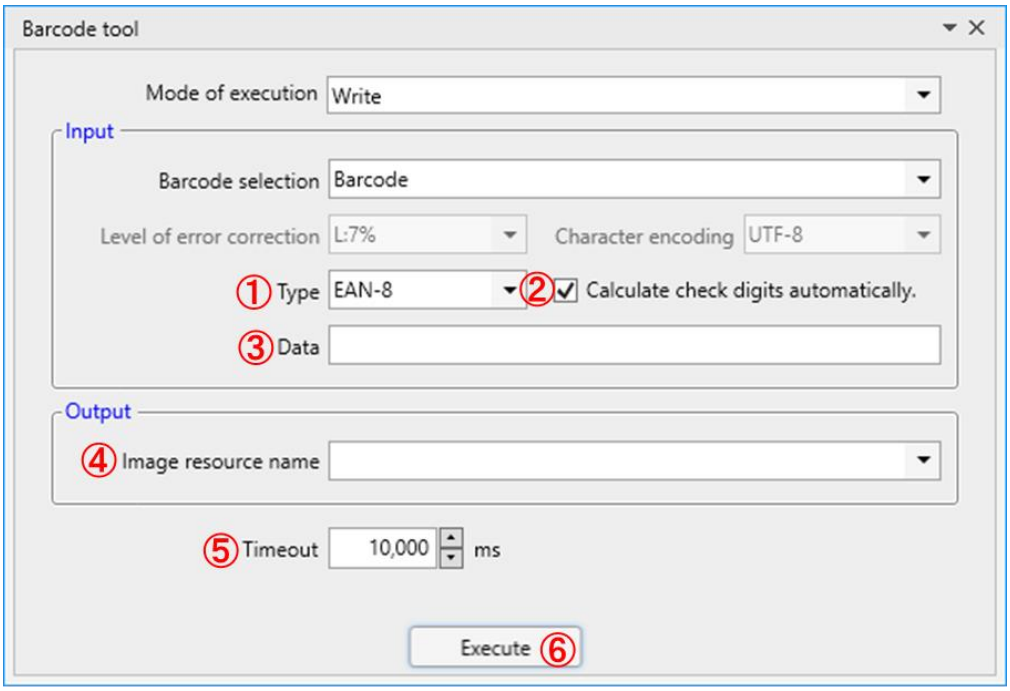


Figure 8-9. "Barcode tool" window (writing a barcode)

① Specify a type of the barcode to be created.

② For data entered in ③, specify whether to use the function that automatically calculates and replaces check digits. For the types that can use this function, see Table 8-6.

③ Specify data to make the barcode. For the data that can be specified, see Table 8-6.

④ Specify "Image resource name" to which the barcode will be output.

⑤ Set the timeout value. If the processing takes longer than the time specified here, the processing will be canceled.

⑥ Click the button to output the barcode to the image resource specified in ④ based on the settings made in ① to ⑤.

9 Settings

9.1 Settings menu

The Settings menu has functions for setting a background color of the image input area and for clearing resources.
Click "Settings" on the menu bar to display its functions as shown in “Figure 9-1. Settings menu" below.

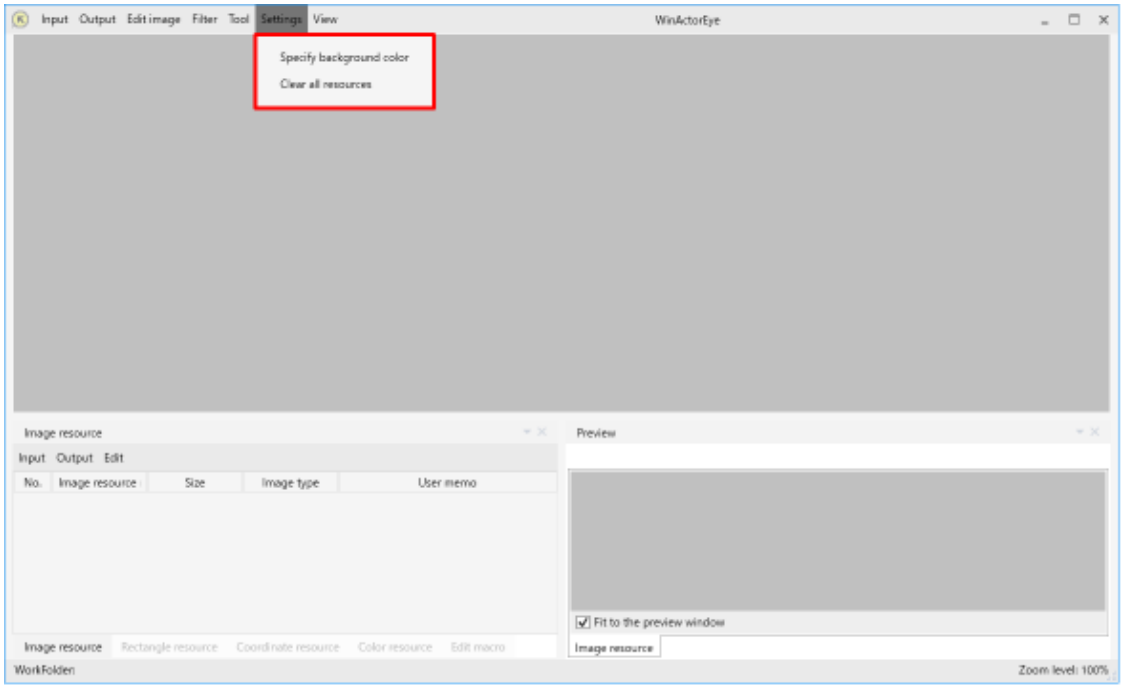


Figure 9-1. Settings menu

Table 9-1. Settings menu

No.	Function	Description
1	Specify background color	Displays the "Specify background color" window. For details, see "9.2 Specify background color."
2	Clear all resources	Clears all registered resources. For details, see "9.3 Clear all resources."

9.2 Specify background color

"Specify background color" is a function to specify a background color of the image input area of WinActorEye.

The elements of the window for specifying a background color are as shown in "Figure 9-2. Window for specifying a background color."

Figure 9-2. Window for specifying a background color

Table 9-2. Window elements for specifying a background color

No.	Element	Description
①	Basic colors	Specify a background color from the color palette.
②	Custom colors	Displays colors added by Define Custom Colors.
③	Define Custom Colors	You can create new custom colors.
④	OK	Confirms your edit.
⑤	Cancel	Cancels your edit.

To create a new color, click the Define Custom Colors button and specify the hue, saturation, luminosity, red, green, and blue.

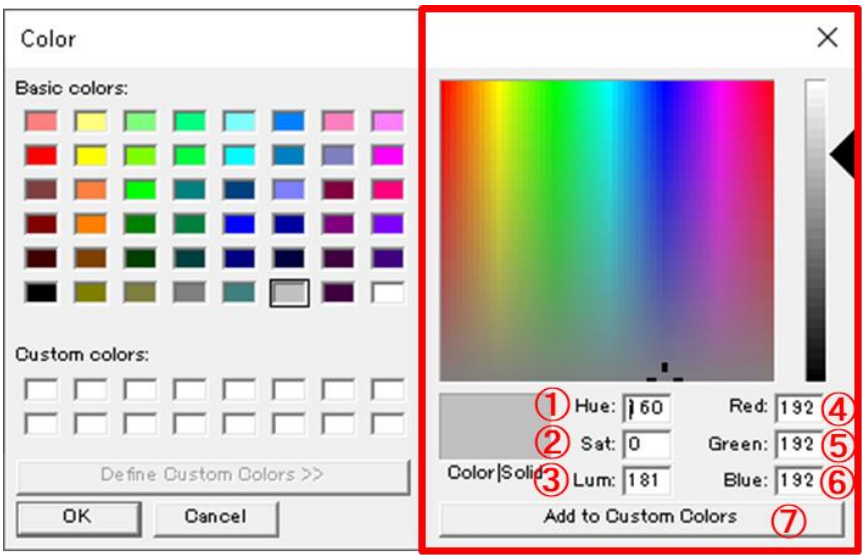


Figure 9-3. Creating a new custom color

Table 9-3. Elements to define a custom color

No.	Element	Description
①	Hue	Adjust the hue of a color in the range of 0 to 239.
②	Sat	Adjust the saturation of a color in the range of 0 to 240.
③	Lum	Adjust the luminosity of a color in the range of 0 to 240.
④	Red	Specify a value for Red in the range of 0 to 255.
⑤	Green	Specify a value for Green in the range of 0 to 255.
⑥	Blue	Specify a value for Blue in the range of 0 to 255.
⑦	Add to Custom Colors	Adds the created custom color to the display of custom colors.

9.3 Clear all resources

"Clear all resources" is a function to clear all resource information registered in WinActorEye.

10 View

10.1 View menu

The View menu has functions to display each pane.

Click "View" on the menu bar to display its functions as shown in "Figure 10-1. View menu" below.

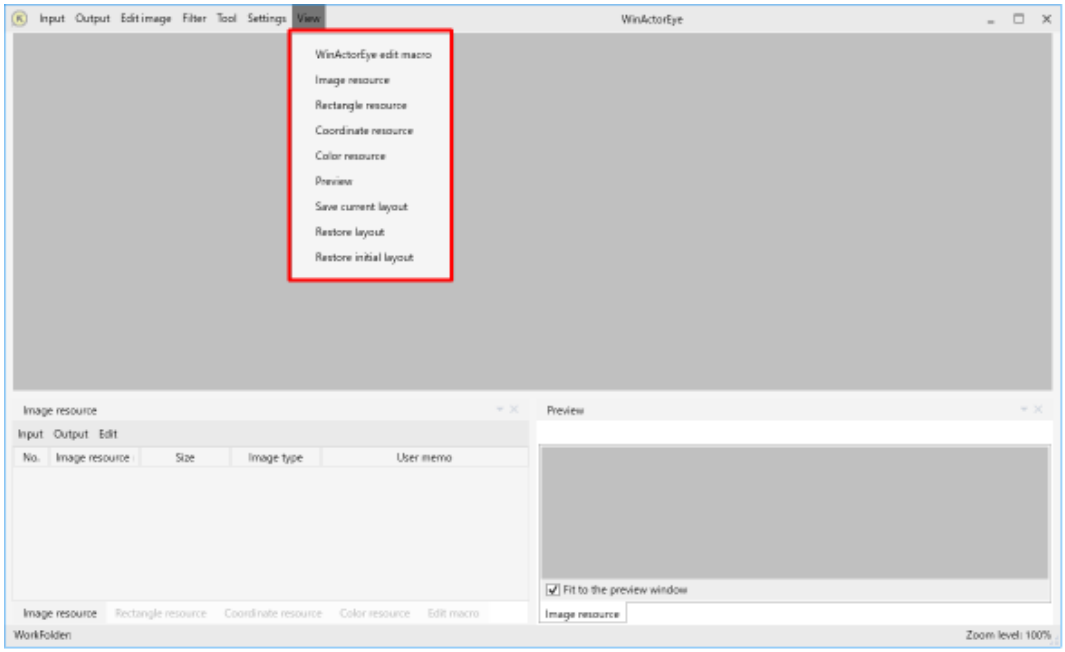


Figure 10-1. View menu

Table 10-1. View menu

No.	Function	Description
1	WinActorEye edit macro	Displays the "Edit macro" pane. For details, see " WinActorEye edit macro."
2	Image resource	Displays the "Image resource" pane. For details, see" 10.3 Image resource."
3	Rectangle resource	Displays the "Rectangle resource" pane. For details, see "10.4 Rectangle resource."
4	Coordinate resource	Displays the "Coordinate resource" pane. For details, see "10.5 Coordinate resource."
5	Color resource	Displays the "Color resource" pane. For details, see "10.6 Color resource."
6	Preview	Displays the “Preview” pane. For details, see “10.7 Preview.”
7	Save current layout	Saves the current layout
8	Restore layout	Restores the saved layout.
9	Restore initial layout	Restores the default layout.

10.2 WinActorEye edit macro

"WinActorEye edit macro" has functions for editing a macro of WinActorEye.

Click "WinActorEye edit macro" in the "View" menu or click the "Edit macro" tab in the resource area to display the "Edit macro" pane.

The items of the "Edit macro" pane are as shown in "Figure 10-2. 'Edit macro' pane."

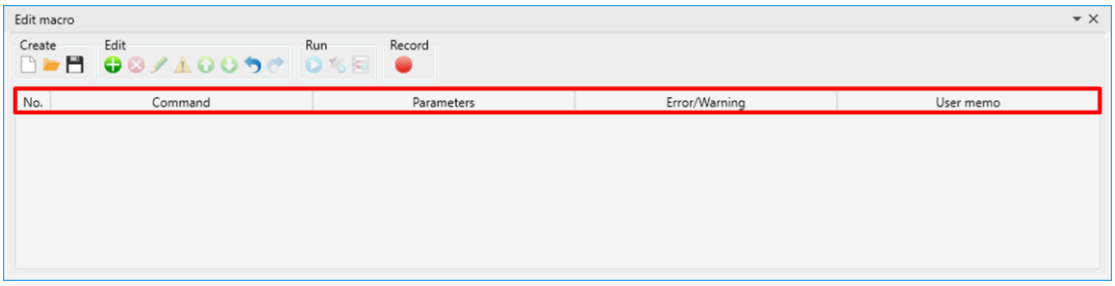


Figure 10-2. "Edit macro" pane

The recorded macro operations will be displayed in the macro area.

Table 10-2. Items in the macro area

No.	Item	Description
1	No.	This will be automatically assigned.
2	Command	Displays commands. It will be set automatically during macro recording.
3	Parameters	Displays parameters. It will be set automatically during macro recording.
4	Error/Warning	Displays warnings during macro recording or errors when running a macro.
5	User memo	It can be used as a memo field when performing maintenance. You can edit a memo by double-clicking or pressing the 'F2' key with the User memo field selected. It is blank in the initial state.

For details on the "WinActorEye edit macro" functions, see "11 Macro."

10.3 Image resource

"Image resource" is a function to display image data and image information input by the Input function.

Click "Image resource" in the "View" menu or click the "Image resource" tab in the resource area to display the "Image resource" pane.

The items of the "Image resource" pane are as shown in "Figure 10-3. "Image resource" pane."

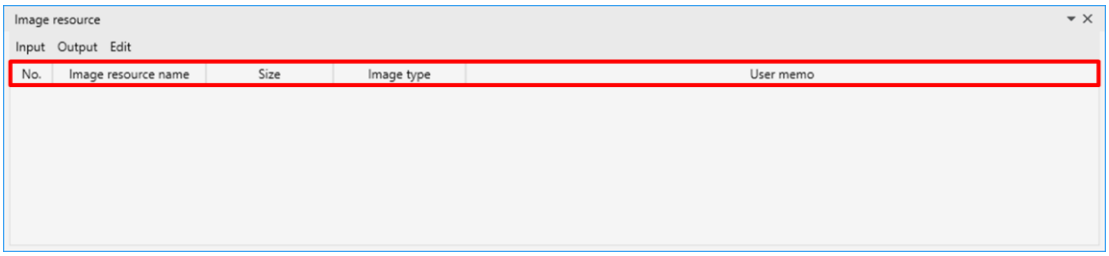


Figure 10-3. "Image resource" pane

The registered resource information will be displayed in the image resource area.

Table 10-3. Items in the image resource area

No.	Item	Description
1	No.	Registered image resources are numbered from "1" in chronological order. It will be automatically assigned.
2	Image resource name	Displays registered image resource names. You can edit a name by double-clicking or pressing the 'F2' key with the Image resource name field selected.
3	Size	Displays image size (width x height).
4	Image type	"RGB" (color, no transparency), "RGB/A" (color, transparency), "GRAY" (black and white), or "W/B" (white/black) type will be automatically identified and set as the image type. If there is no applicable type, "Unknown" will be displayed.
5	User memo	It can be used as a memo field when performing maintenance. You can edit a memo by double-clicking or pressing the 'F2' key with the User memo field selected. It is blank in the initial state.

On the menu bar, there are menus for executing each function.
You can input an image from a file, the clipboard, or by a snapshot using the "Input" menu.

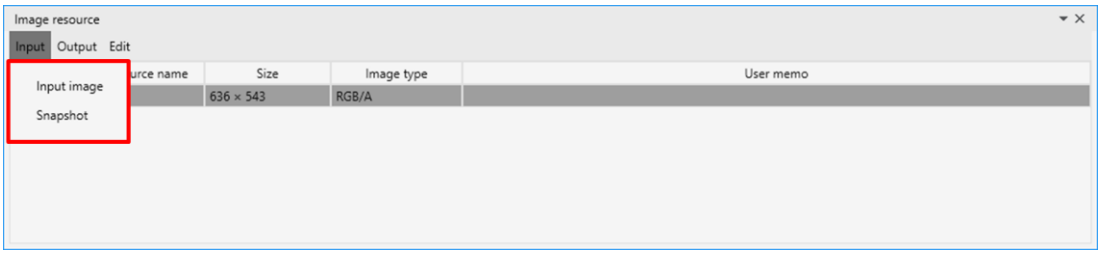


Figure 10-4. "Image resource" pane (Input menu)

Table 10-4. Image resource (Input menu)

No.	Function	Description
1	Input image	Inputs an image from a file or the clipboard. For details, see "4.2 Input image."
2	Snapshot	Inputs an image using a snapshot. For details, see "4.3 Snapshot."

You can output an image using the "Output" menu.

Figure 10-5. "Image resource" pane (Output menu)

For details on the "Output image" function, see "5.2 Output image."

You can copy registered image resources or delete unnecessary parts by using the "Edit" menu.

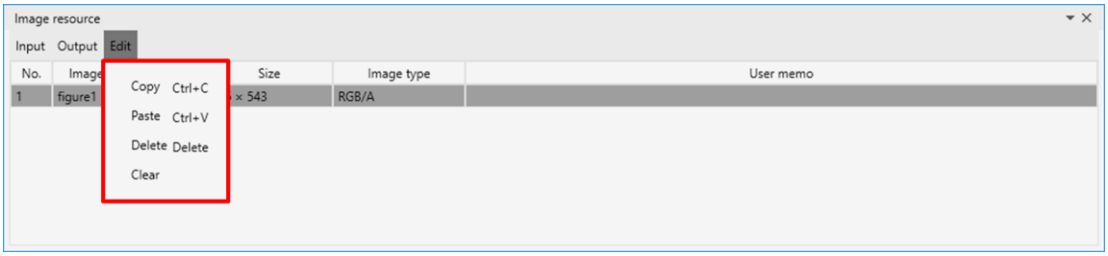


Figure 10-6. "Image resource" pane (Edit menu)

Table 10-5. Image resource (Edit menu)

No.	Function	Keyboard	Description
1	Copy	‘Ctrl’ + ‘C’ key	Copies selected resources.
2	Paste	‘Ctrl’ + ‘V’ key	Pastes copied resources. If a copied image resource name already exists when pasting, the image resource name will be registered with the copied image resource name with "_copy_" and a number at the end. Example) Copied image resource name_copy_1 If the numbers are duplicated, the resource name will be registered with the number moved up by 1. Example) Copied image resource name_copy_2
3	Delete	‘Delete’ key	Deletes selected resources.
4	Clear		Clears all registered resources.

10.4 Rectangle resource

The "Rectangle resource" pane displays registered rectangle resources.

Click "Rectangle resource" in the "View" menu or click the "Rectangle resource" tab in the resource area to display the "Rectangle resource" pane.

A rectangle resource will be registered by executing the "7.4 Detect rectangles" function or by using methods such as dragging the mouse over a target on an image resource displayed in the image input area.

The rectangle information created by dragging (x-coordinate at the upper left of the rectangle [x], y-coordinate at the upper left of the rectangle [y], width of the rectangle [w], height of the rectangle [h], angle of the rectangle [a]) will all be registered on the rectangle resource named "MAIN." The user memo and rectangle information of "MAIN" cannot be edited.

The items in the "Rectangle resource" pane are as shown in "Figure 10-7. "Rectangle resource" pane

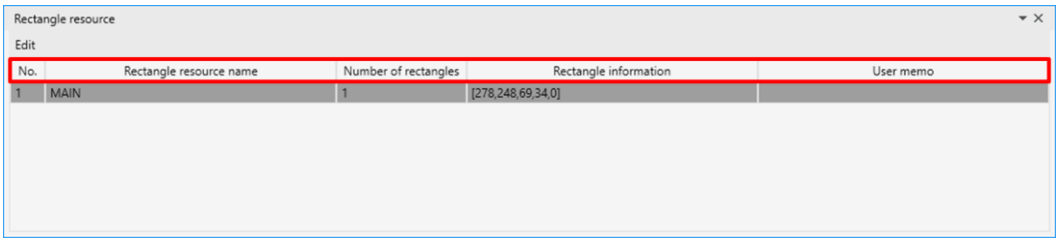


Figure 10-7. "Rectangle resource" pane

The registered resource information will be displayed in the rectangle resource area.

Table 10-6. Items in the rectangle resource area

No.	Item	Description
1	No.	Registered rectangle resources are numbered from "1" in chronological order. It will be automatically assigned.
2	Rectangle resource name	Displays registered rectangle resource names. You can edit a name by double-clicking or pressing the 'F2' key with the Rectangle resource name field selected.
3	Number of rectangles	Displays the number of rectangles detected. If the number of rectangles is zero, it will be blank.
4	Rectangle information	Displays detected rectangle information. Displays [x,y,w,h,a] for the information on one rectangle. Example) [10,20,50,60,0] For the information on multiple rectangles, displays the information by separating with ",". Example) [10,20,50,60,70],[20,30,40,50,60],[30,40,50,60,70] If there is no rectangle information, it will be blank.
5	User memo	It can be used as a memo field when performing maintenance. You can edit a memo by double-clicking or pressing the 'F2' key with the User memo field selected. It is blank in the initial state.

You can copy registered rectangle resources, delete unnecessary parts, or call the "Edit rectangle resource" window by using the "Edit" menu.

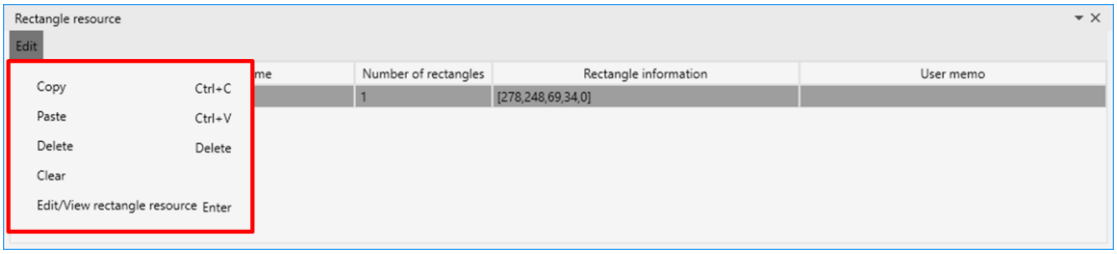


Figure 10-8. "Rectangle resource" pane (Edit menu)

Table 10-7. Rectangle resource (Edit menu)

No.	Function	Keyboard	Description
1	Copy	‘Ctrl’ + ‘C’ key	Copies selected resources.
2	Paste	‘Ctrl’ + ‘V’ key	Pastes copied resources. If a copied rectangle resource name already exists when pasting, the rectangle resource name will be registered with the copied rectangle resource name with "_copy_" and a number at the end. Example) Copied rectangle resource name_copy_1 If the numbers are duplicated, the resource name will be registered with the number moved up by 1. Example) Copied rectangle resource name_copy_2
3	Delete	‘Delete’ key	Deletes selected resources. "MAIN" cannot be deleted.
4	Clear		Clears all registered resources.
5	Edit/View rectangle resource	‘Enter’ key	Shows a selected resource in the "Edit rectangle resource" window. When "MAIN" is selected, the "View rectangle resource" window will be displayed. You cannot edit the resource in this window.

In the "Edit rectangle resource" window, you can edit parameters of "Rectangle resource name," "User memo," and "Rectangle information" for the selected rectangle resource.

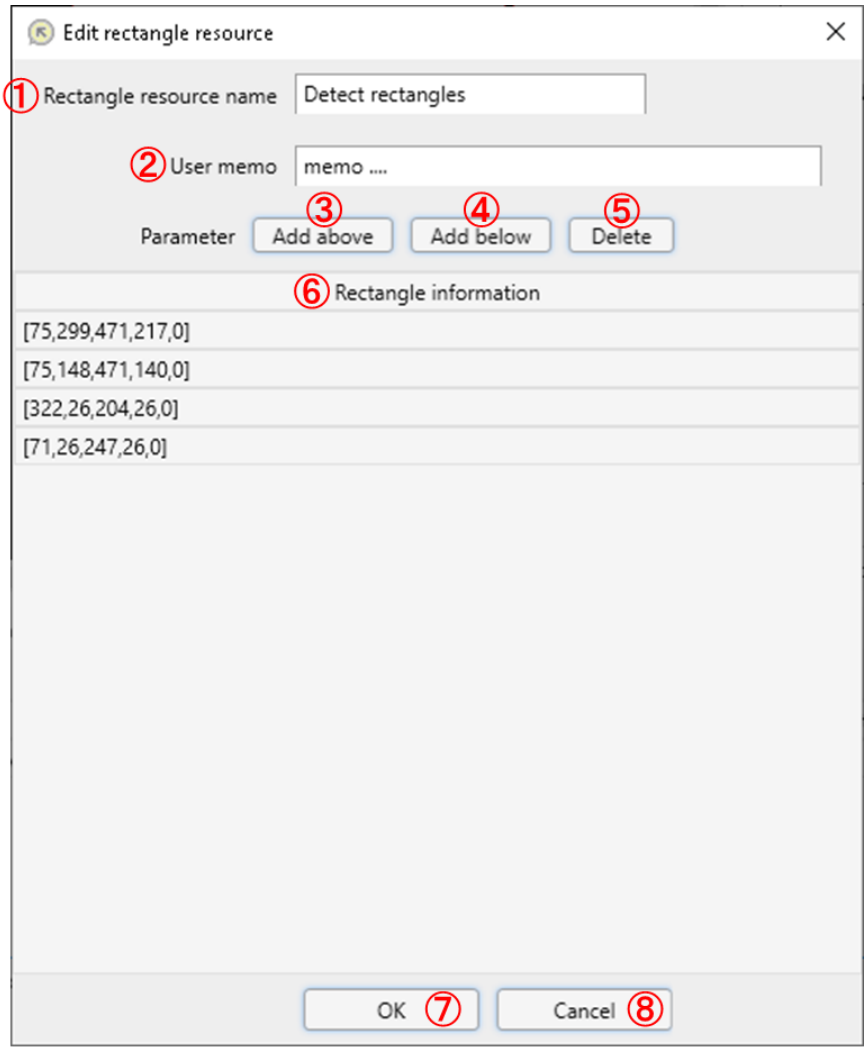


Figure 10-9. "Edit rectangle resource" window

Table 10-8. "Edit rectangle resource" window elements

No.	Element	Description
①	Rectangle resource name	Shows the registered rectangle resource name. You can edit it by clicking its input field.
②	User memo	Shows the registered user memo. It can be used as a memo field when performing maintenance. You can edit it by clicking its input field.
③	Add above	Adds [x,y,w,h,a] above the selected rectangle information with all 0s ([0,0,0,0,0]). If not selected, it will be added at the top.
④	Add below	Adds [x,y,w,h,a] below the selected rectangle information with all 0s ([0,0,0,0,0]). If not selected, it will be added at the bottom.
⑤	Delete	Deletes the selected rectangle information.
⑥	Rectangle information	Shows the rectangle information being edited. You can edit the information by double-clicking or pressing the 'F2' key with the rectangle information selected. If it is not in [x,y,w,h,a] format, it returns to the previous value.
⑦	OK	Confirms your edit.
⑧	Cancel	Cancels your edit.

10.5 Coordinate resource

The "Coordinate resource" pane displays registered coordinate resources. Click "Coordinate resource" in the "View" menu or click the "Coordinate resource" tab in the resource area to display the "Coordinate resource" pane. A coordinate resource will be registered by executing the "7.9 Extract coordinates from rectangle" function or by using methods such as clicking a target on an image resource displayed in the image input area.

The coordinate information created by clicking (center coordinate of "○" displayed in the image input area: x-coordinate [x], y-coordinate [y]) will all be registered on the coordinate resource named "MAIN." The user memo and coordinate information of "MAIN" cannot be edited.

The items in the "Coordinate resource" pane are as shown in "Figure 10-10. "Coordinate resource" pane"

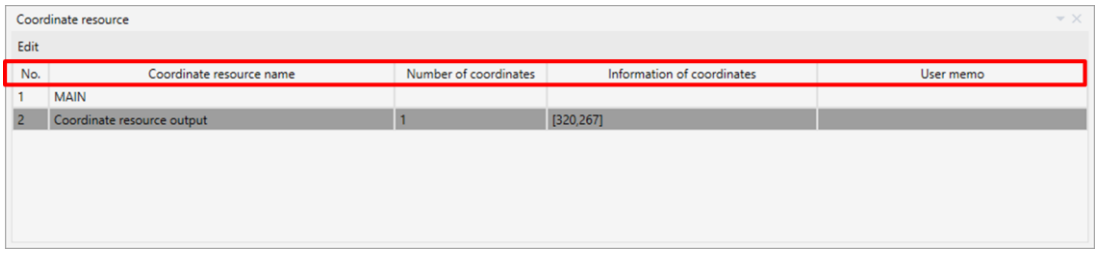


Figure 10-10. "Coordinate resource" pane

The registered resource information will be displayed in the coordinate resource area.

Table 10-9. Items in the coordinate resource area

No.	Item	Description
1	No.	Registered coordinate resources are numbered from "1" in chronological order. It will be automatically assigned.
2	Coordinate resource name	Displays registered coordinate resource names. You can edit a name by double-clicking or pressing the 'F2' key with the Coordinate resource name field selected.
3	Number of coordinates	Displays the number of coordinates.
4	Information of coordinates	Displays detected information of coordinates. Displays [x,y] for the information on one coordinates. Example) [10,20] For the information on multiple coordinates, displays the information by separating with ",". Example) [10,20],[20,30],[30,40],[40,50] If there is no information of coordinates, it will be blank.
5	User memo	It can be used as a memo field when performing maintenance. You can edit a memo by double-clicking or pressing the 'F2' key with the User memo field selected. It is blank in the initial state.

You can copy registered coordinate resources, delete unnecessary parts, or call the "Edit coordinate resource" window by using the "Edit" menu.

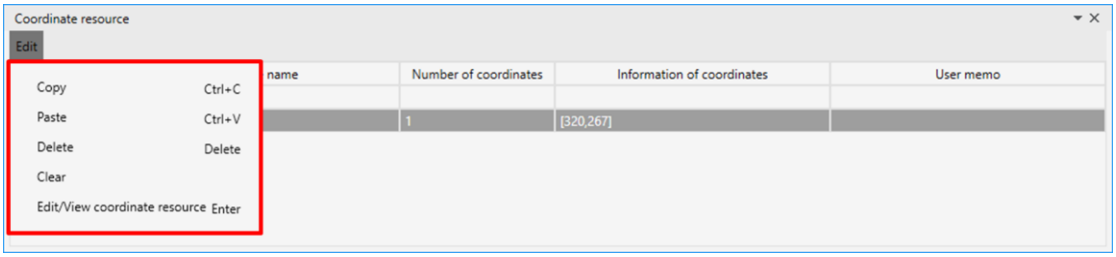


Figure 10-11. "Coordinate resource" pane (Edit menu)

Table 10-10. Coordinate resource (Edit menu)

No.	Function	Keyboard	Description
1	Copy	‘Ctrl’ + ‘C’ key	Copies selected resources.
2	Paste	‘Ctrl’ + ‘V’ key	Pastes copied resources. If a copied coordinate resource name already exists when pasting, the coordinate resource name will be registered with the copied coordinate resource name with "_copy_" and a number at the end. Example) Copied coordinate resource name_copy_1 If the numbers are duplicated, the resource name will be registered with the number moved up by 1. Example) Copied coordinate resource name_copy_2
3	Delete	‘Delete’ key	Deletes selected resources. "MAIN" cannot be deleted.
4	Clear		Clears all registered resources.
5	Edit/View Coordinate Resource	‘Enter’ key	Shows a selected resource in the "Edit coordinate resource" window. When "MAIN" is selected, the "View coordinate resource" window will be displayed. You cannot edit the resource in this window.

In the "Edit coordinate resource" window, you can edit parameters of "Coordinate resource name," "User memo," and "Information of coordinates" for the selected coordinate resource.

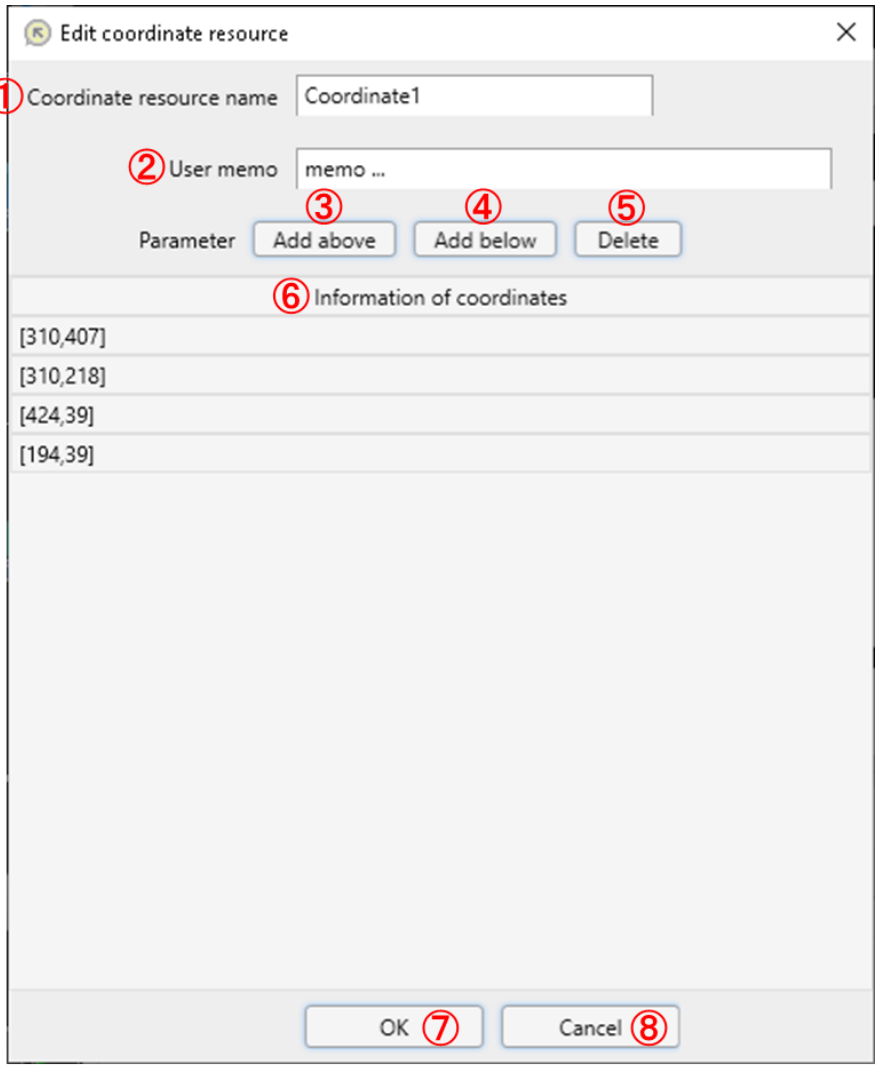


Figure 10-12. "Edit coordinate resource" window

Table 10-11. "Edit coordinate resource" window elements

No.	Element	Description
①	Coordinate resource name	Shows the registered coordinate resource name. You can edit it by clicking its input field.
②	User memo	Shows the registered user memo. It can be used as a memo field when performing maintenance. You can edit it by clicking its input field.
③	Add above	Adds [x,y] above the selected coordinate information with all 0s ([0,0]). If not selected, it will be added at the top.
④	Add below	Adds [x,y] below the selected coordinate information with all 0s ([0,0]). If not selected, it will be added at the bottom.
⑤	Delete	Deletes the selected coordinate information.
⑥	Information of coordinates	Shows the information of coordinates being edited. You can edit the information by double-clicking or pressing the 'F2' key with the coordinate information selected. If it is not in [x,y] format, it returns to the previous value.
⑦	OK	Confirms your edit.
⑧	Cancel	Cancels your edit.

10.6 **Color resource**

The "Color resource" pane displays color resources and allows you to edit those resources. By specifying a color resource as an input item of "Search specified color," it is possible to search by specifying a color.

Click "Color resource" in the "View" menu or click the "Color resource" tab in the resource area to display the "Color resource" pane.

The items in the "Color resource" pane are as shown in "Figure 10-13. "Color resource" pane."

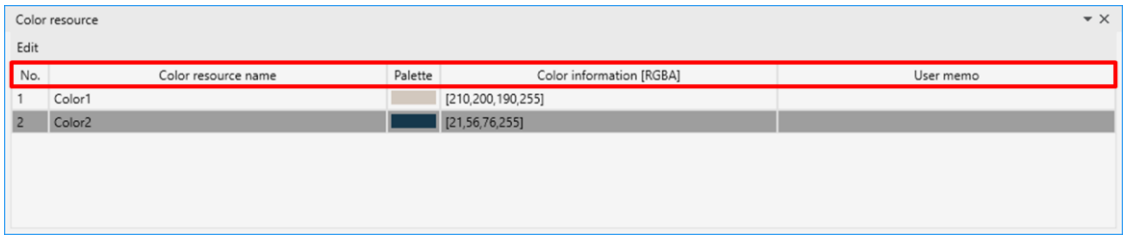


Figure 10-13. "Color resource" pane

The registered resource information will be displayed in the color resource area.

Table 10-12. Items in the color resource area

No.	Item	Description
1	No.	Registered color resources are numbered from "1" in chronological order. It will be automatically assigned.
2	Color resource name	Displays registered color resource names. You can edit a name by double-clicking or pressing the 'F2' key with the Color resource name field selected.
3	Palette	Displays images of registered color information [RGBA].
4	Color information [RGBA]	Displays detected color information in RGBA ([Red, Green, Blue, Alpha). You can edit information by double-clicking or pressing the 'F2' key with the Color information [RGBA] field selected.
5	User memo	It can be used as a memo field when performing maintenance. You can edit a memo by double-clicking or pressing the 'F2' key with the User memo field selected. It is blank in the initial state.

You can register new color resources, copy registered color resources, or delete unnecessary parts by using the "Edit" menu.

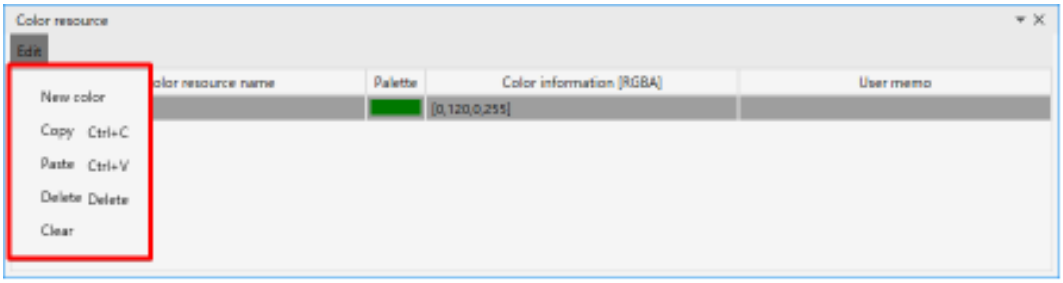


Figure 10-14. "Color resource" pane (Edit menu)

Table 10-13. Color resource (Edit menu)

No.	Function	Keyboard	Description
1	New color		Creates a new color resource. The color information [RGBA] of the new color resource is [0,0,0,255]. The color resource name of the new color resource is “New color resource.” If the “New color resource” preexists, a sequence number is appended to the resource name. Example) “New color resource_1” If the resource name of the same sequence number preexists, the sequence number will be incremented by one. Example) “New color resource_2”
2	Copy	‘Ctrl’ + ‘C’ key	Copies selected resources.
3	Paste	‘Ctrl’ + ‘V’ key	Pastes copied resources. If a copied color resource name already exists when pasting, the color resource name will be registered with the copied color resource name with "_copy_" and a number at the end. Example) Copied color resource name_copy_1 If the numbers are duplicated, the resource name will be registered with the number moved up by 1. Example) Copied color resource name_copy_2
4	Delete	‘Delete’ key	Deletes selected resources.
5	Clear		Clears all registered resources.

10.7 **Preview**

The "Preview" pane displays the input resource which is specified in the property area of the selected function, and its resource information. Click ”Preview” in the “View” menu to display the “Preview” pane.

The items in the "Preview" pane are as shown in "Figure 10-15. "Preview " pane.

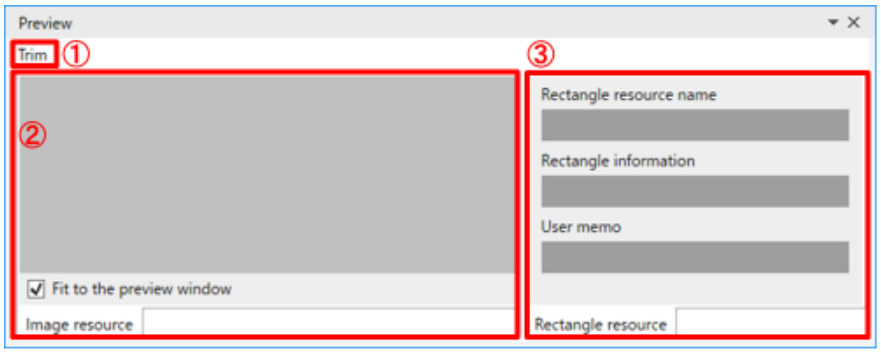


Figure 10-15. "Preview " pane

Table 10-14. Items in the preview area

No.	Item	Description
1	Target function name	Shows the function name of the target function.
2	Main tab	Displays the image, rectangle, or coordinate resource which is specified as the input in the property area. Maximum and minimum number of pixels on the contour may also be displayed as rectangles of dotted lines based on the origin of the displayed image.
3	Resource tab	Shows various resource information.

The configuration of the preview area changes according to the selected function The items in the "Preview" area are as shown in "Table 10-15. Items in the preview area."
For details of the Main tab, see “10.7.1 Main tab.”
For details of the Resource tab, see “10.7.2 Resource tab (Image resource),” “10.7.3 Resource tab (Rectangle resource),” “10.7.4 Resource tab (Coordinate resource),” and “10.7.5 Resource tab (Color resource).”

Table 10-15. Items in the preview area

Function name	Items in the preview area
Output image	Main tab (*)
Trim	Main tab, Resource tab (Rectangle resource)
Histogram search	Main tab, Resource tab (Image resource)
Detect rectangles	Main tab (*)
Detect circles	Main tab (*)
Search specified color	Main tab, Resource tab (Color resource)
Boolean operation	Main tab, Resource tab (Image resource)
Selection algorithm	Main tab, Resource tab (Rectangle resource)
Extract coordinates from rectangle	Main tab, Resource tab (Rectangle resource)
OCR tool	Main tab (*)
Color picker tool	Main tab, Resource tab (Coordinate resource)
Barcode tool	Main tab (*)

(*) The “Main tab” only is displayed. The “Resource tab” is not displayed.

10.7.1 Main tab

The main tab displays the Image resource, the rectangle resource, the coordinate resource, or the pixels on the contour.

Figure 10-16 Main tab (“Rectangle resource” is specified as the input.)

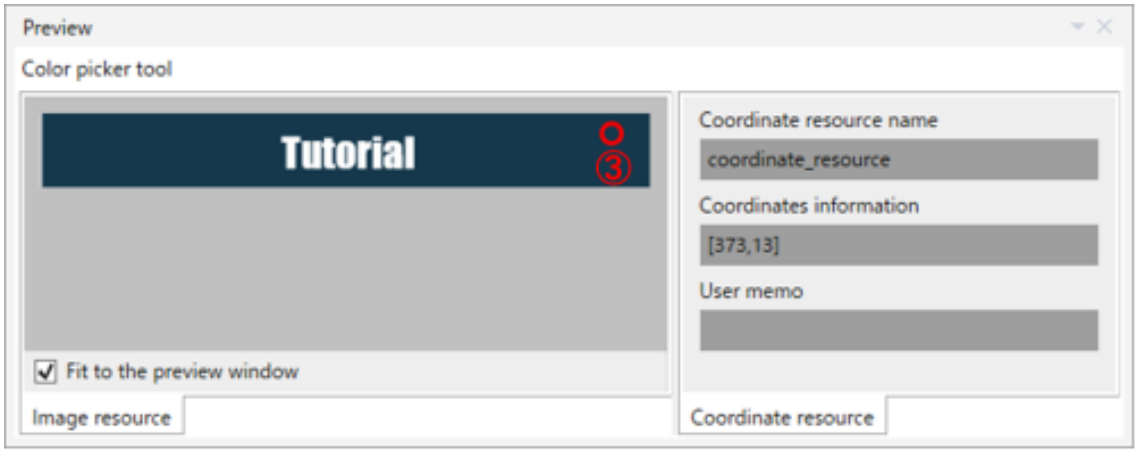


Figure 10-17 Main tab (“Coordinate resource” is specified as the input.)

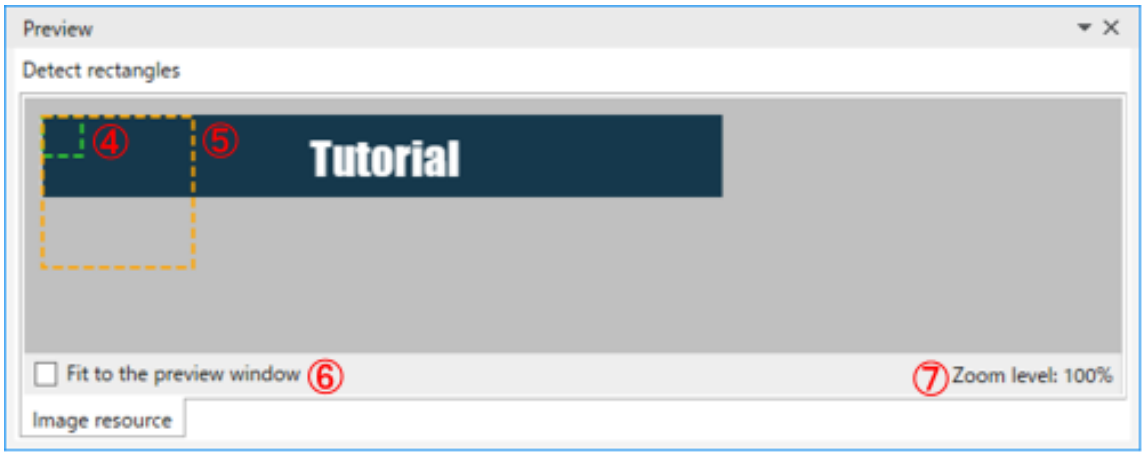


Figure 10-18 Main tab (Pixels on the contoour are specified.)

Table 10-16. Items in the main tab

No.	item	Description
1	Image resource	Displays the image resource specified as the input resource.
2	Rectangle resource	Shows the rectangle resource by red lines if it is specified as the input resource.
3	Coordinate resource	Shows the coordinate resource by red circles if it is specified as the input resource.
4	Minimum number of pixels on the contour	Shows the minimum number of pixels on the contour by dotted green lines if the minimum number of pixels on the contour is specified.
5	Maximum number of pixels on the contour	Shows the maximum number of pixels on the contour by dotted orange lines if the maximum number of pixels on the contour is specified.
6	Fit to the preview window	Changes zooming the displayed image. (See “10.7.6 Fit to the preview window”)
7	Zoom level	Displays the zooming level of the image. This is displayed only if the “Fil to the preview window” checkbox is unchecked. (See “10.7.6 Fit to the preview window”)

10.7.2 Resource tab (Image resource)

The resource tab (Image resource) is displayed in the right half of the preview area when the second image resource that is specified in the property pane as the input resource exists. The resource tab (Image resource) itself displays the second image resource specified as the input resource.

The pixels on the contour are not displayed in the resource tab (Image resource).

Figure 10-19 Resource tab (Image resource)

Table 10-17. Items in the resource tab (Image resource)

No.	item	Description
1	Image resource	Displays the second image resource specified in the property pane as the input resource.
2	Fit to the preview window	Changes zooming behavior of the displayed image. (See “10.7.6 Fit to the preview window”)
3	Zoom level	Displays the zooming level of the image. This is displayed only if the checkbox “Fil to the preview window” is unchecked. (See “10.7.6 Fit to the preview window”)

10.7.3 Resource tab (Rectangle resource)

The resource tab (Rectangle resource) is displayed in the right half of the preview area when a rectangle resource is specified in the property pane as the input resource. The resource tab (Rectangle resource) itself shows resource information of the rectangle resource specified in the property pane.

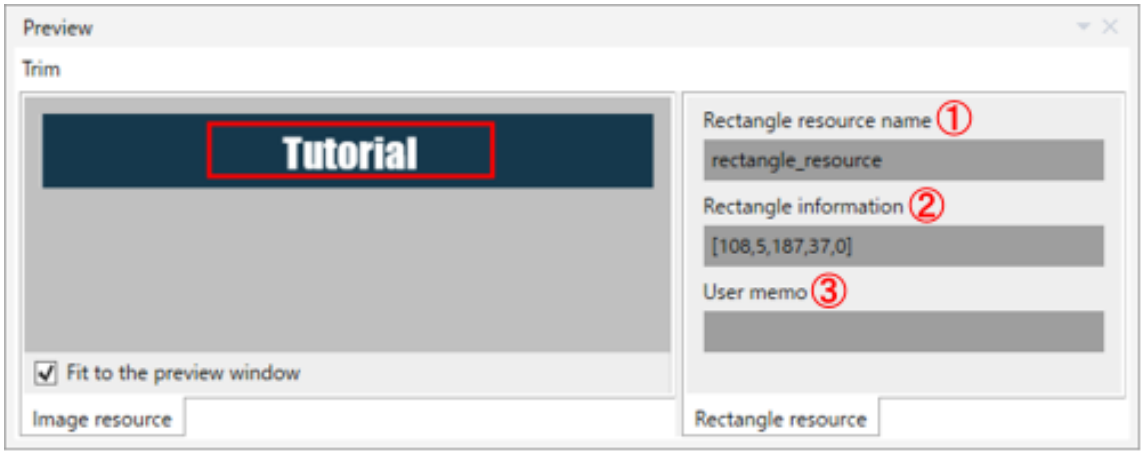


Figure 10-20 Resource tab (Rectangle resource)

Table 10-18. Items in the resource tab (Rectangle resource)

No.	item	Description
1	Rectangle resource name	Shows the rectangle resource name specified as the input resource.
2	Rectangle information	Shows the rectangle information of the rectangle resource specified as the input resource.
3	User memo	Shows the user memo of the rectangle resource specified as the input resource.

10.7.3.1 The case two resource tabs (Rectangle resource) are displayed

If two rectangle resources are specified in the property pane as input resource, two resource tabs (Rectangle resource) are displayed one upon the other.

The overlapping resource tabs (Rectangle resource) can be switched by clicking the tabs.

Both rectangle resources are displayed on the main tab, and the rectangle resource corresponding to the selected resource tab (Rectangle resource) is displayed in thick lines. (See “Figure 10-21 The case two resource tabs (Rectangle resource) are displayed.”)

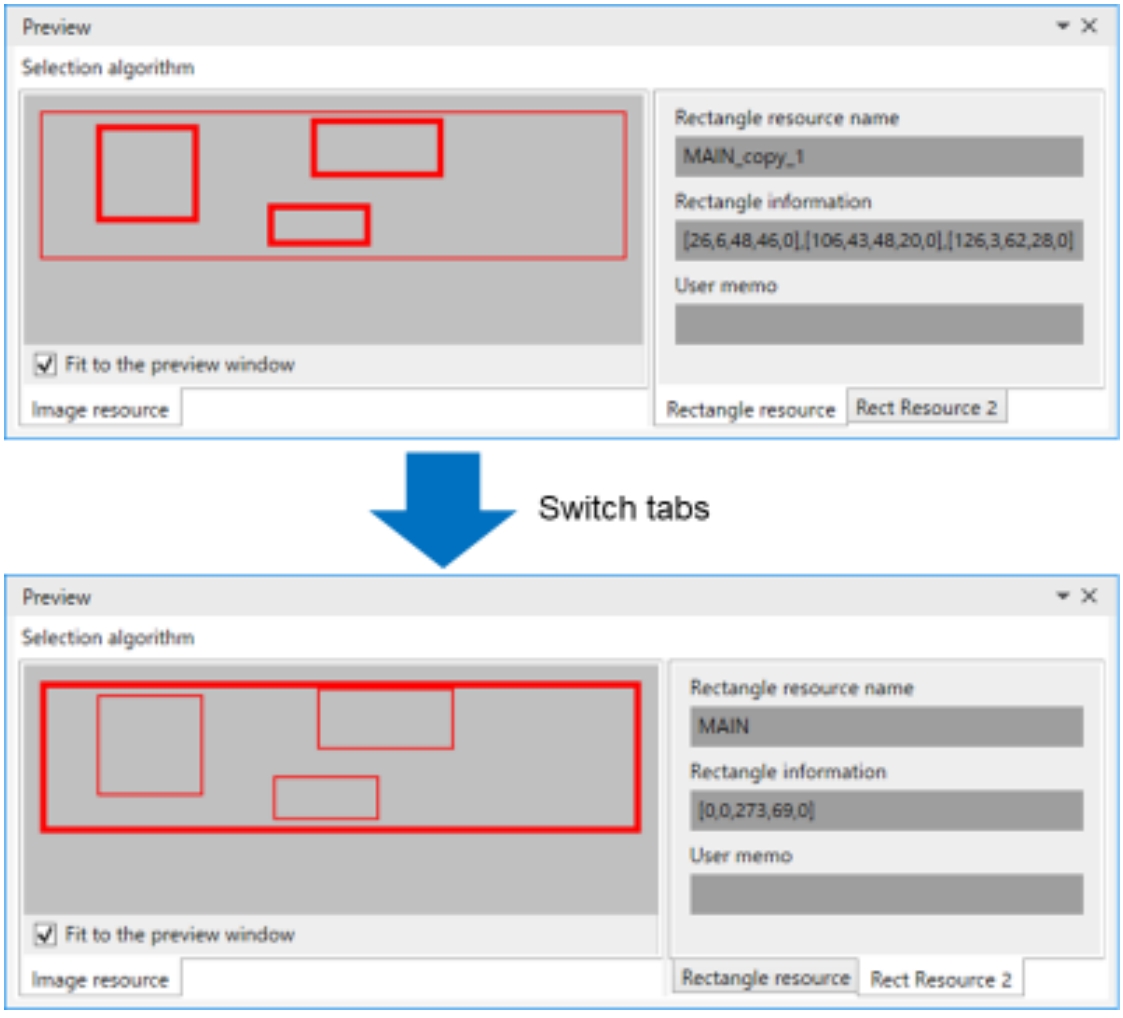


Figure 10-21 The case two resource tabs (Rectangle resource) are displayed.

10.7.4 Resource tab (Coordinate resource)

The resource tab (Coordinate resource) is displayed in the right half of the preview area when a coordinate resource is specified in the property pane as the input resource. The resource tab (Coordinate resource) itself shows resource information of the coordinate resource specified in the property pane.

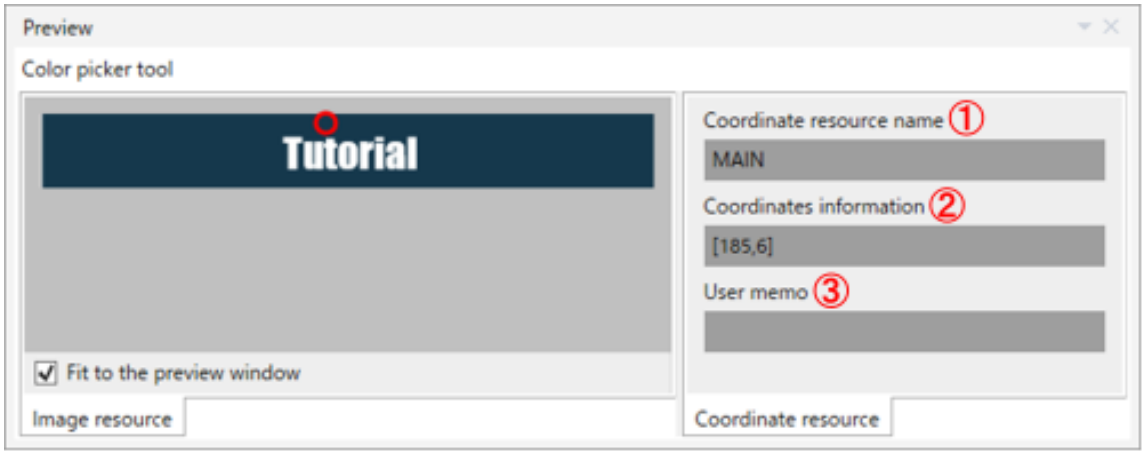


Figure 10-22 Resource tab (Coordinate resource)

Table 10-19. Items in the resource tab (Coordinate resource)

No.	item	Description
1	Coordinate resource name	Shows the coordinate resource name specified as the input resource.
2	Coordinates information	Shows the coordinates information of the coordinate resource specified as the input resource.
3	User memo	Shows the user memo of the coordinate resource specified as the input resource.

10.7.5 Resource tab (Color resource)

The resource tab (Color resource) is displayed in the right half of the preview area when a color resource is specified in the property pane as the input resource. The resource tab (Color resource) itself shows resource information of the color resource specified in the property pane.

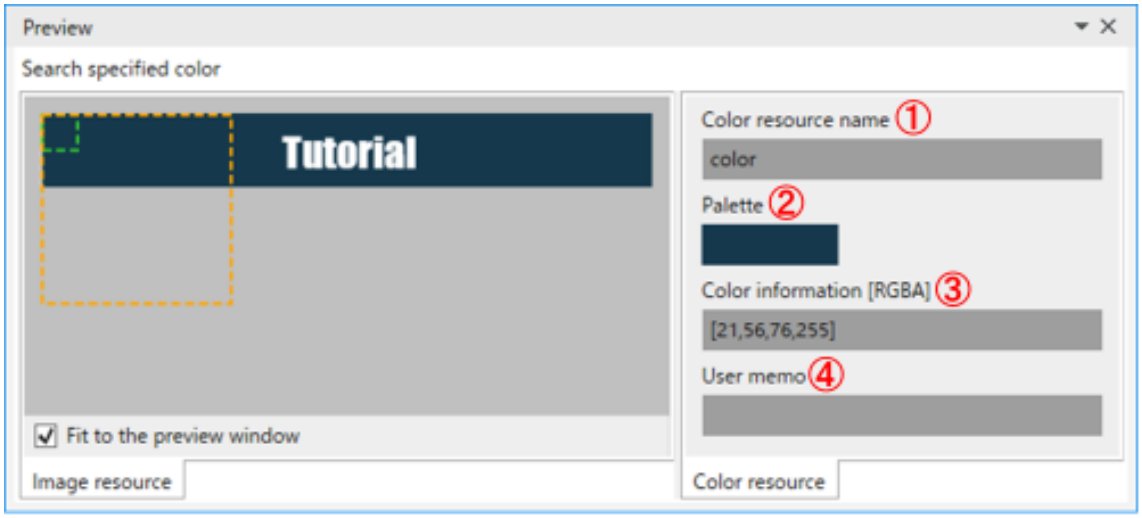


Figure 10-23 Resource tab (Color resource)

Table 10-20. Items in the resource tab (Color resource)

No.	item	Description
1	Color resource name	Shows the color resource name specified as the input resource.
2	Palette	Shows the color information[RGBA] image of the color resource specified as the input resource.
3	Color information[RGBA]	Shows the color information of the color resource specified as the input resource.
4	User memo	Shows the user memo of the color resource specified as the input resource.

10.7.6 Fit to the preview window

Zooming in and out functions can be toggled in the main tab and in the image resource tab with the checkbox “Fit to the preview window.”

When the checkbox “Fit to the preview window” is checked, the displayed image is zoomed in or out to fit to the preview area keeping original image’s aspect ratio.

When the checkbox “Fit to the preview window” is unchecked, the image resource is displayed in its original image size, and can be zoomed in and out.

Table 10-21. List of zooming in and out operations

No.	Operation	Function
1	‘Ctrl’ key + Mouse wheel	Zooming in or out
2	‘Ctrl’ + ‘+’ key	Zooming in
3	‘Ctrl ‘+ ‘-’ key	Zooming out

11 Macro

11.1 Macro functions

You can save an operation procedure on WinActorEye to a file by using the Macro functions. A macro of WinActorEye can be run from a scenario of WinActor.

11.2 Edit macro

"Edit macro" has functions for editing a macro of WinActorEye. Click "WinActorEye edit macro" in the "View" menu or click the "Edit macro" tab in the resource area to display the "Edit macro" pane.

For details of the "Edit macro" pane, see "10.2 WinActorEye edit macro."

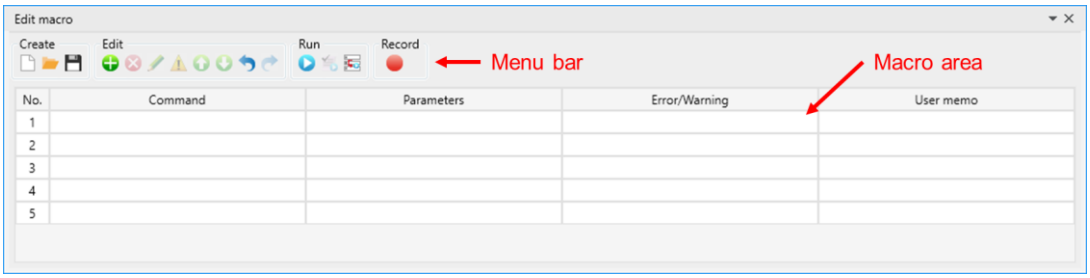


Figure 11-1. "Edit macro" pane

On the menu bar, there are menus for executing each function. For details, see "11.3 Menu bar."

The macro area displays a macro being edited. For details, see "11.4 Macro area."

When an editing operation is performed in the image input area of WinActorEye with the macro recording function turned "ON," the performed operation will be recorded in the macro area.

Use the "Create" menu to save or load a created macro.

Use the "Edit" menu to rearrange the order of operations in, change parameters of, or delete unnecessary parts in a recorded macro.

Use the "Run" menu to check the operations of a created macro.

For details, see "11.3.1 Create" to "11.3.4 Record."

11.3 Menu bar

11.3.1 Create

The "Create" menu is to save or load a created macro.

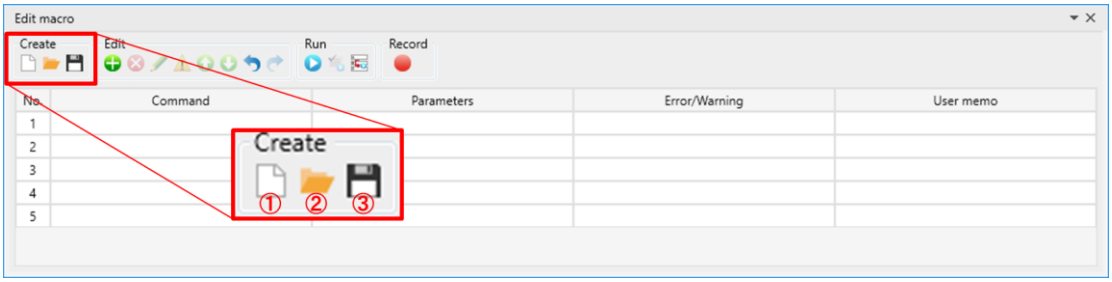


Figure 11-2. "Edit macro" pane (Create menu)

Table 11-1. Create menu

No.	Function	Keyboard	Description
①	New	'Ctrl' + 'N' key	Clears the macro area.
②	Open	'Ctrl' + 'O' key	Loads a macro stored in a file. The file selection window appears when clicked. In the file selection window, select a file to be loaded.
③	Save	'Ctrl' + 'S' key	Saves a macro in the macro area to a file. The file selection window appears when clicked. In the file selection window, select a file to save a macro.

11.3.2 Edit

Use the "Edit" menu to rearrange the order of operations in, change parameters of, or delete unnecessary parts in a recorded macro.

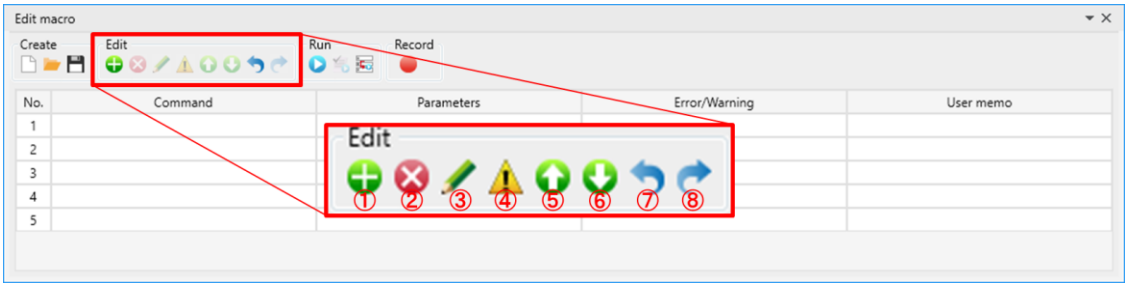


Figure 11-3. "Edit macro" pane (Edit menu)

Table 11-2. Edit menu

No.	Function	Keyboard	Description
①	Insert	'Insert' key	Inserts a blank row.
②	Delete	'Delete' key	Deletes a selected operation.
③	Edit	'Enter' key	Opens the "Edit macro item" window to edit parameters of a selected operation. For details, see "11.5 Edit macro item."
④	Remove error/warning	'.' key*	Removes the error/warning for a selected operation.
⑤	Up	'-' key*	Moves the order of a selected operation upward.
⑥	Down	'+' key*	Moves the order of a selected operation downward.
⑦	Undo	'Ctrl' + 'Z' key	Undoes the last edit operation.
⑧	Redo	'Ctrl' + 'Y' key	Redoes the last undone edit operation.

* Can be operated only with the numeric keypad.

11.3.3 Run

Use the "Run" menu to check the operations of a created macro.

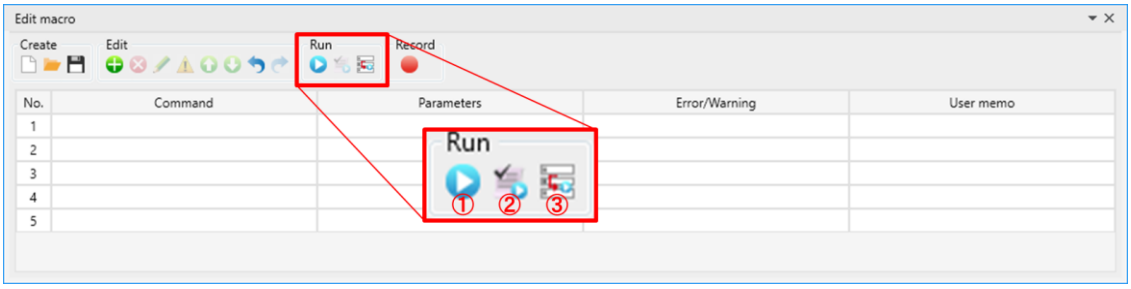


Figure 11-4. "Edit macro" pane (Run menu)

Table 11-3. Run menu

No.	Function	Keyboard	Description
①	Run all	'F5' key	Runs all recorded macro operations. If an error occurs, it will stop at that row.
②	Run selected		Runs a selected step in a macro.
③	Step	'F6' key	Runs a macro step by step.

11.3.4 Record

The macro recording function can be switched "ON" and "OFF" by clicking the icon of the "Record" menu.

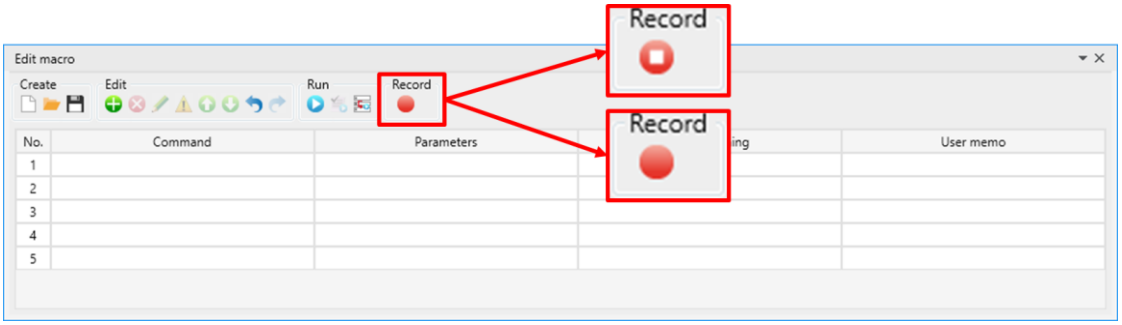


Figure 11-5. "Edit macro" pane (Record menu)

Table 11-4. Record menu

No.	Function	Keyboard	Description
1	Record	'F9' key	This is to specify whether to set the macro recording. When it is set to ON (enabled), performed operations will be recorded in the macro area. When it is set to OFF (disabled), performed operations will not be recorded.

Table 11-5. Macro recording setting and its display

No.	Setting	Display
1	ON (enabled)	
2	OFF (disabled)	

11.4 Macro area

The macro area displays "No.," "Command," "Parameters," "Error/Warning," and "User memo" for a macro. "Command" and "Parameters" are set automatically during the macro recording. "Error/Warning" displays warnings during the macro recording or errors when running a macro. You can write notes in "User memo." For details of the macro area, see "Table 10-2. Items in the macro area."

In the macro area, you can perform the keyboard and mouse operations shown in the table below.

Table 11-6. Operations in the macro area

Key	Mouse	Description
↑	—	Selects a previous operation.
↓	—	Selects a next operation.
PageUp	—	Scrolls the macro area upward.
PageDown	—	Scrolls the macro area downward.
—	Click	Selects a clicked operation.
Enter	Double-click	Opens the "Edit macro item" window to edit parameters of an operation. For details, see "11.5 Edit macro item."
Delete	—	Deletes a selected operation.
Insert	—	Inserts a blank row.
-*	—	Moves the order of a selected operation upward.
+*	—	Moves the order of a selected operation downward.
.*	—	Removes the error/warning for a selected operation.
F2	Double-click	On the user memo field, double-clicking or pressing the F2 key changes the user memo field to the edit mode.
F5	—	Runs all macro operations.
F6	—	Runs a macro step by step.
F9	—	Turns the recording function ON/OFF.
Ctrl +Z	—	Undoes the last edit operation.
Ctrl +Y	—	Redoes the last undone edit operation.

* Can be operated only with the numeric keypad.

11.5 Edit macro item

In the "Edit Macro Item" window, you can edit "Command name," "Error/Warning," "User memo," and "Parameters" for the selected operation in a macro.

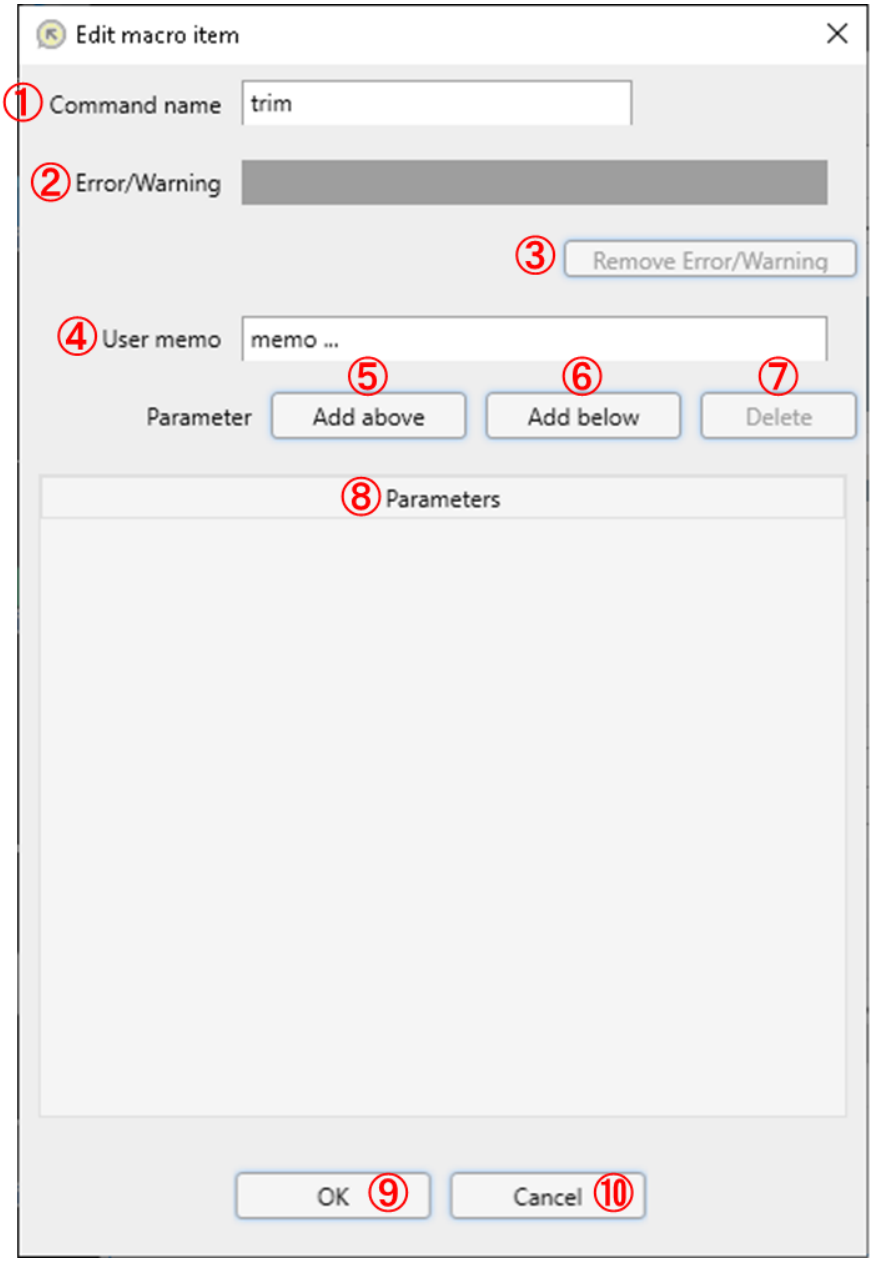


Figure 11-6. "Edit macro item" window

Table 11-7. "Edit macro item" window elements

No.	Element	Description
①	Command name	Shows the command name. You can edit it by clicking its input field.
②	Error/Warning	Shows the error/warning.
③	Remove Error/Warning	Removes the error/warning.
④	User memo	Shows the registered user memo. It can be used as a memo field when performing maintenance. You can edit it by clicking its input field.
⑤	Add above	Adds a parameter above the selected parameter.
⑥	Add below	Adds a parameter below the selected parameter.
⑦	Delete	Deletes the selected parameter.
⑧	Parameters	Shows the parameters being edited. You can edit them by clicking each parameter.
⑨	OK	Confirms your edit.
⑩	Cancel	Cancels your edit.

11.6 Running a macro from a scenario of WinActor

When you want to run a macro of WinActorEye from a scenario of WinActor, use "Eye_ReadAndRunMacro" provided as a library on WinActor. Place the "Eye_ReadAndRunMacro" library in the flowchart area of WinActor and specify a file path of the saved macro in the property window of the library.

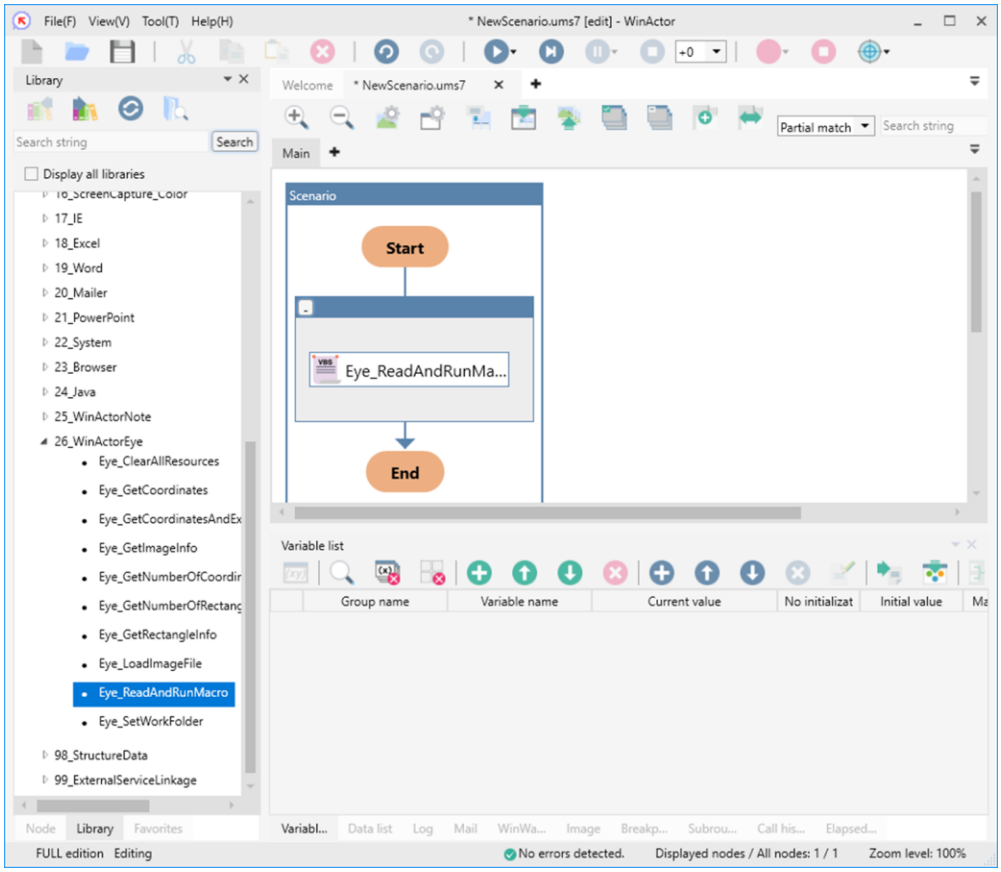


Figure 11-7. "Eye_ReadAndRunMacro" library

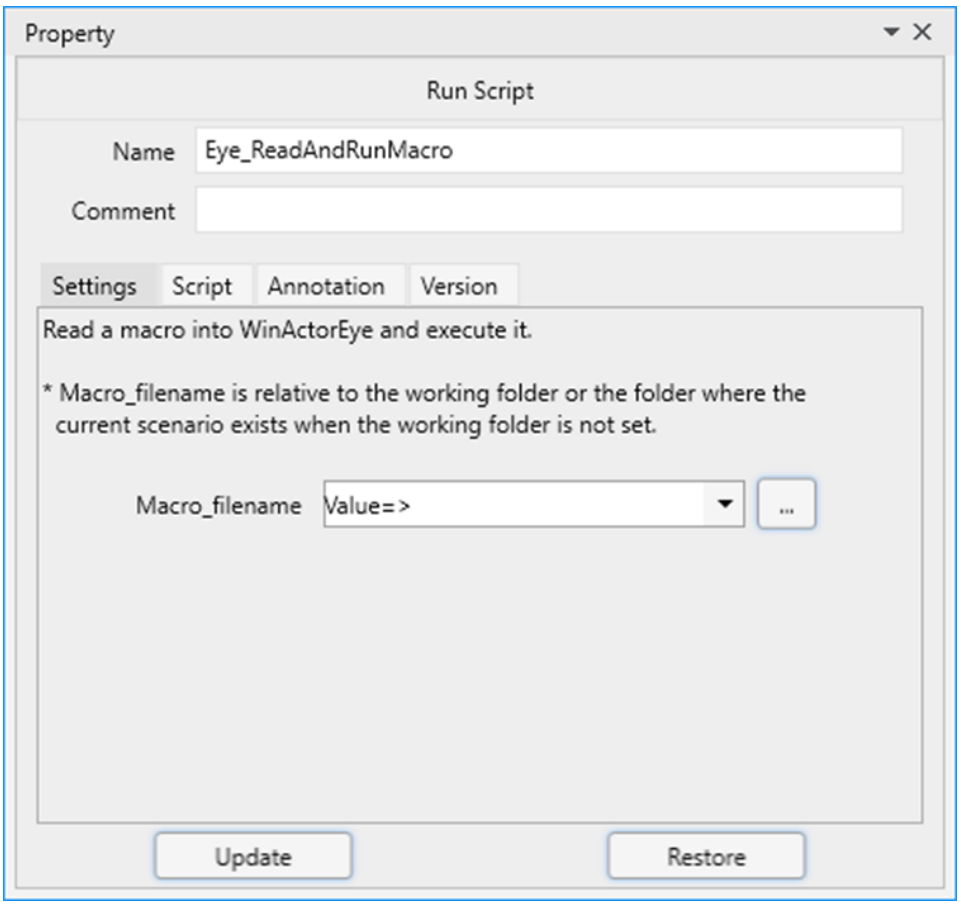


Figure 11-8. "Eye_ReadAndRunMacro" library property window

12 Notice

12.1 Behaviors on calling scenario file

When WinActor starts executing a scenario, input data of WinActorEye will be initialized. However, when WinActor starts executing the ‘Call scenario file’ node or the ‘GoToScenario’ library, input data will not be initialized.

WinActorEye Operation Manual

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