

Instruction Manual

Object Graph Visualizer

Version 3.1



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Instruction Manual

This instruction manual is a user guide for the application „Object Graph Visualizer“.
(OGV, Version 3.1)

1. Minimum Requirements

CPU: 1.4 GHz

RAM: 2 GB

Disk Space: 55 MB (Object Graph Visualizer)
160 MB (Java Runtime Environment)

Graphics Card: Intel HD Graphics 4000 (or similar)

Operating System: Windows, Mac OS X or Linux
(Tested on Windows 7, Windows 8.1, OS X 10.10 and Ubuntu 15.04)

Java Runtime (JRE): Java 8u45

2. Installation

Object Graph Visualizer uses the Java Runtime Environment 8u45. Java needs to be installed beforehand. The application can then be started by double-clicking the Java executable *OGV.jar* or by running the command *java -jar OGV.jar*.

Windows user can also start the binary, which can be found at */bin/OGV.exe*. There is also an alternative installer: */bin/OGV Installer.exe*. Java comes prepacked, startmenu items are created and OGV gets a registry entry.

3. Application Overview

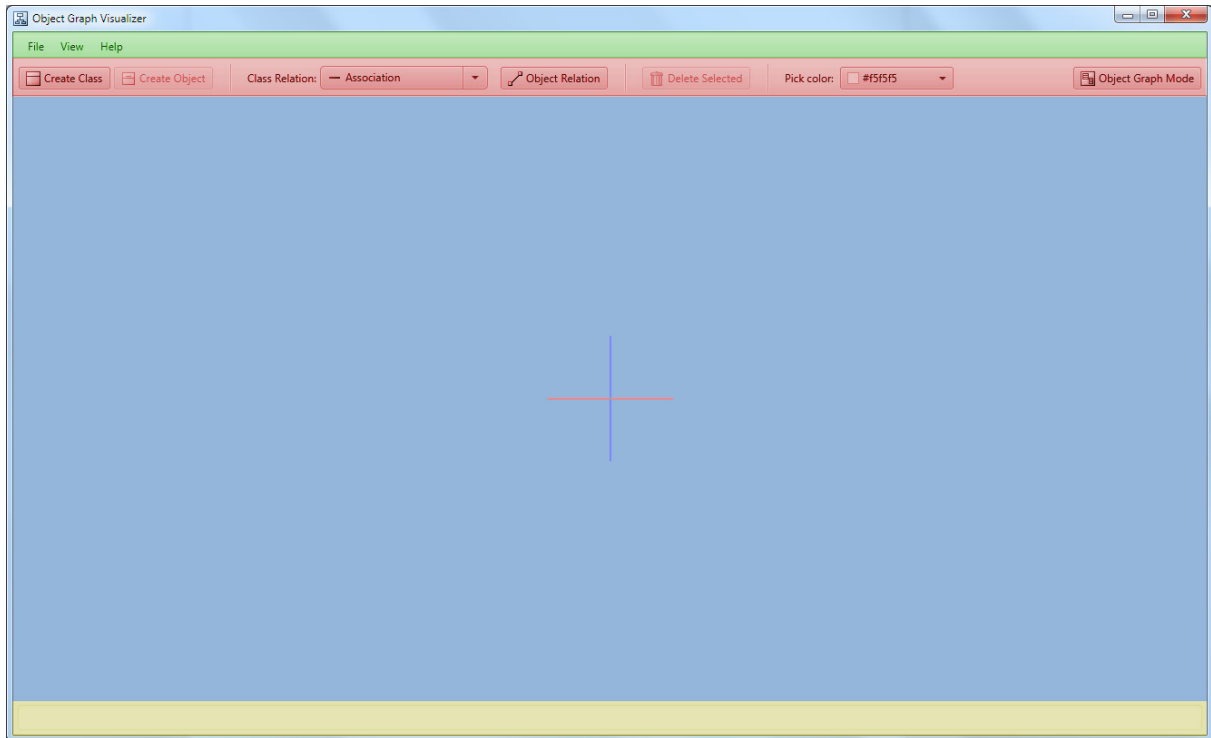






Figure 1: Colorized application overview

Caption:

-  (green): Menubar > File, View, Help
-  (red): Toolbar > Create Class, Create Object, Class Relation, Object Relation, Delete Selected, Colorpicker, Object Graph Mode
-  (blue): 3D scene (with the axis in middle of the screen)
-  (yellow): Statusbar

4. Menubar

4.1. File

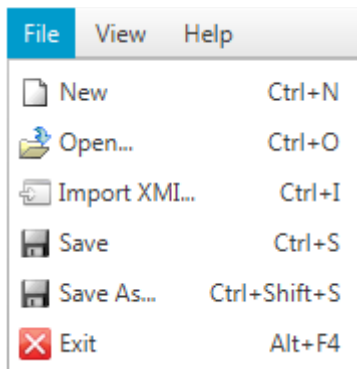


Figure 2: File menu

4.1.1. New

With the menu item „New“ the existing project is cleared and a new project initializes.

4.1.2. Open

With the menu item „Open...“ a file chooser dialog opens and a previously saved *.ogv file can be loaded. A notification in the status bar indicates successful project initialization or possibly an error message.

4.1.3. Import XMI

„Import XMI...“ opens a file chooser dialog allowing XMI formatted *.xml files to be loaded. The XMI format can differ depending on the software used to create them. Currently XMI 1.1 files from „Enterprise Architect“ are supported.

4.1.4. Save

The menu item „Save“ allows the current project to be persisted as an *.ogv file.

4.1.5. Save As

With the menu item „Save As...“ the current project can be saved to another *.ogv file

4.1.6. Exit

With this menu item, the application can be closed.

4.2. View

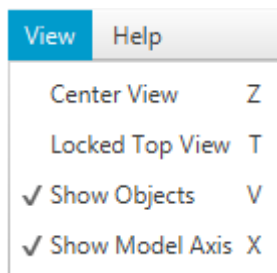


Figure 3: View menu

4.2.1. Center View

Moves the camera to the origin of the 3D scene.

4.2.2. Locked Top View

If this menu item is checked, the camera takes a top-down view and rotation is locked.

4.2.3. Show Objects

If this menu item is checked, the objects and objectrelations are visible. Note that the menu items „Create Object“, „Object Relation“ and „Object Graph Mode“ and are disabled when „Show Objects“ is inactive.

4.2.4. Show Model Axis

Shows or hides the model axis. The model axis indicates the origin of the 3D scene and is pivot of the camera rotation.

4.3. Help

4.3.1. About

Opens a dialog box with information about this application.

5. Camera

To be able to move and position the camera accurately a mouse is recommended.

Move Camera	
Primary	Focus 3D scene. Press and hold down left mouse button + move mouse
Alternative	Arrow keys
Rotate Camera	
Primary	Focus 3D scene. Press and hold down right mouse button + move mouse
Alternative	-
Zoom	
Primary	Mouse wheel up: zoom in, mouse wheel down: zoom out
Alternative	Press and hold middle mouse button + move mouse forward / backward

6. 3D Scene Interaction

6.1. Selection

Selected items are marked with a blue border or have blue color. Following entities in the 3D scene can be selected by a left click:

- Classes
- Class names
- Class attributes
- Objects
- Object names
- Object attribute values
- Relations
- Multiplicities
- Roles

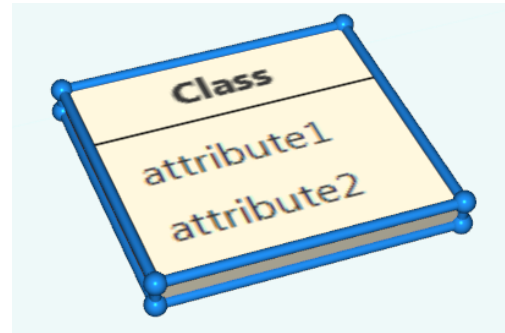


Figure 4: A selected class



Figure 5: A selected target role

The application only allows single selection. Entities can be deselected by a left click on the floor or background of the 3D scene.

6.2. Class Interaction

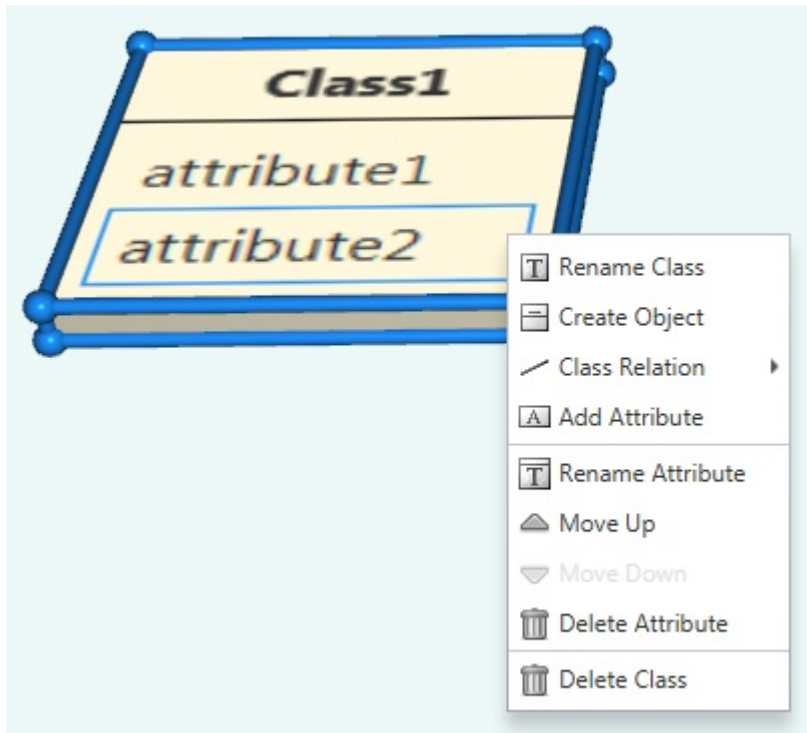


Figure 6: Class context menu. An attribute is selected.

6.2.1. Create Class

There are two ways of creating a new class:

- „Create Class“ button in the toolbar (Shortcut key “C”):
 - 1) Toggle the „Create Class“ button.
 - 2) The mouse cursor becomes a crosshair in the 3D scene.
 - 3) A new class will be created at the position the user specifies by left clicking.

- Context menu item „Create Class“:
 - 1) Focus on the floor in the 3D scene
 - 2) Open the context menu with a right click.
 - 3) Choose the menu item „Create Class“.
 - 4) The new class will be created at this position.

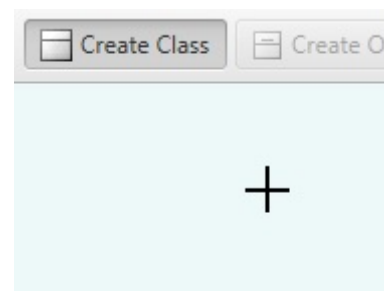


Figure 7: "Create Class" toggled

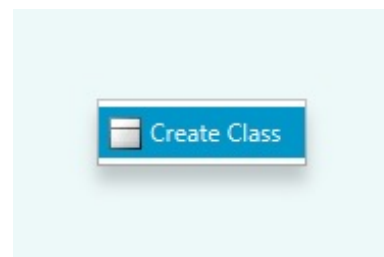


Figure 8: "Create Class" context menu

The quick edit mode is activated immediately after a new class is created so that its name may be changed. Pressing enter will set the name, and the mode will then switch to adding attributes with each subsequent press of Enter. The user can leave the quick edit mode by deselecting the class, pressing Ctrl + Enter (last edited attribute remains) or pressing Esc (last edited attribute resets).

6.2.2. Move Class

Classes can be moved around on the floor (xy-plane) by dragging and dropping them.

6.2.3. Resize Class

Classes can be resized by selecting them, then dragging the borders of the selection box.

6.2.4. Rename Class

A class can be renamed by double clicking the name field or by selecting the „Rename Class“ menu item from the class context menu.

The class is renamed when the user presses Enter, or cancelled if the user presses Esc. Note that class names must be unique for a project. If renaming a class fails, a message will be displayed in the status bar.

6.2.5. Add Attribute

To add an attribute to a selected class, bring up the class context menu and select the menu item „Add Attribute“. The new attribute can be edited immediately.

6.2.6. Rename Attribute

An existing attribute can be renamed with a double click on the label or by selecting it and then choosing the context menu item „Rename Attribute“.

6.2.7. Move Up / Move Down

Selected attributes can be moved up or down by choosing the context menu item „Move Up“ or „Move Down“.

6.2.8. Delete Attribute

Selected attributes can be deleted by either pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Attribute“ menu item in the class context menu.

6.2.9. Color Class

The color of a selected class can be changed by choosing a color from the colorpicker in the toolbar. Note that all objects of that class change color too.

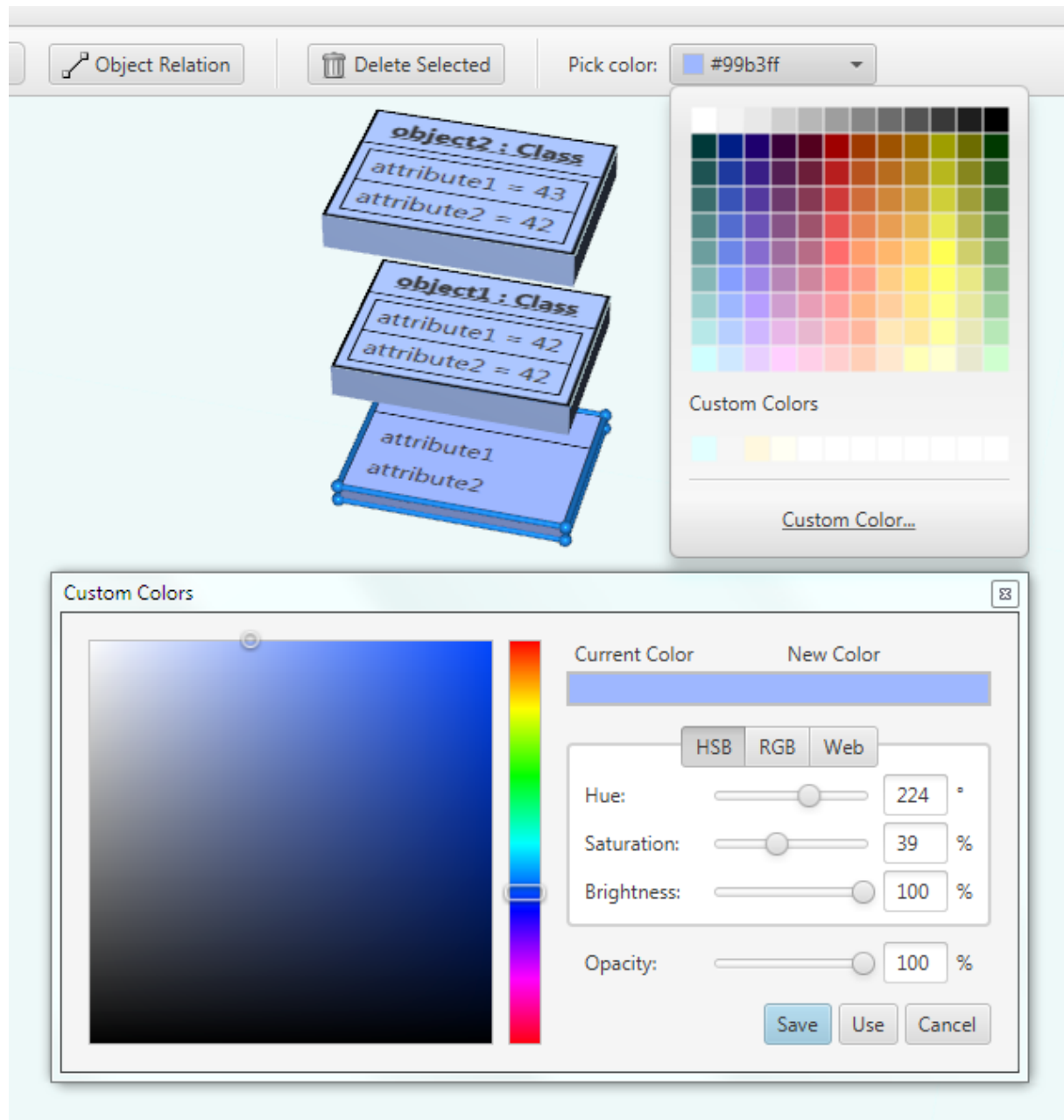


Figure 9: Picking a custom color for a class

6.2.10. Delete Class

A selected class can be deleted by either pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Class“ menu item in the class context menu.

6.3. Object Interaction

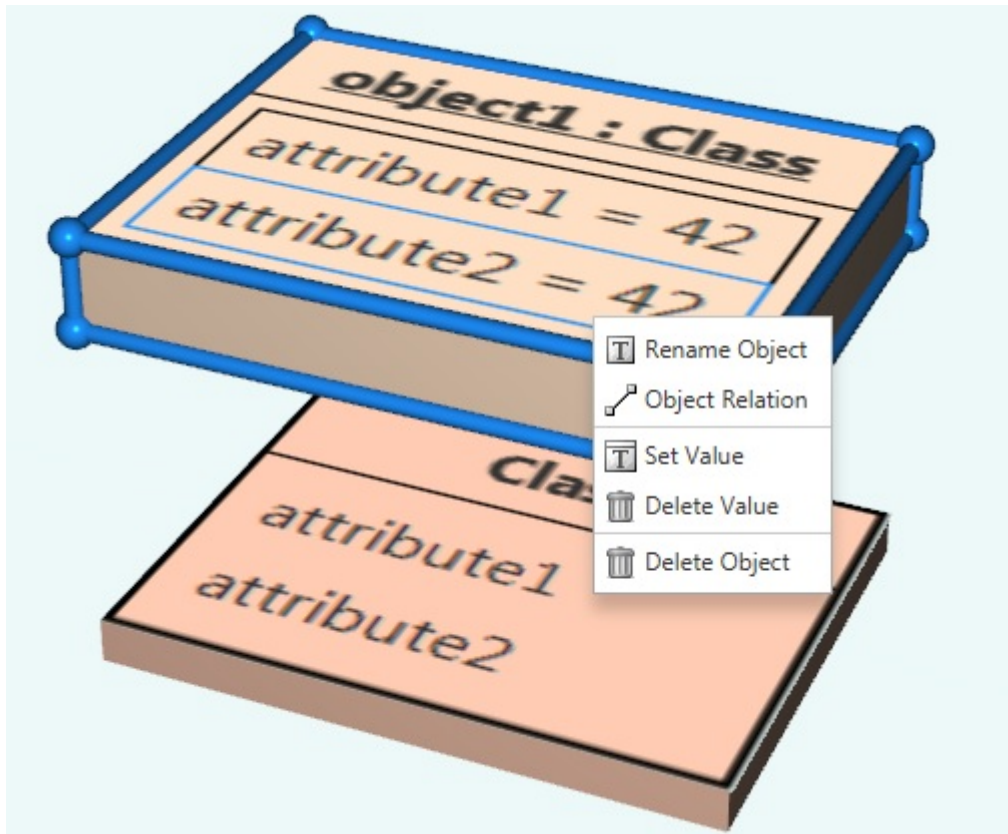


Figure 10: Object context menu. A value is selected.

6.3.1. Create Object

There are two ways of creating an object:

- „Create Object“ button in the toolbar (Shortcut key “O”):
 - 1) Select the class you want to create objects for.
 - 2) Press the “Create Object” button.
 - 3) The new object will be created above the class.
- Context menu item „Create Object“:
 - 1) Select the class you want to create objects for.
 - 2) Open the class context menu with a right click.
 - 3) Choose the menu item „Create Object“.
 - 4) The new object will be created above the class.

The quick edit mode is activated immediately after a new object is created so that its name may be changed. Pressing enter will set the name, and the mode will then switch to editing attribute values with each subsequent press of Enter. The user can leave the quick edit mode by deselecting the object, pressing Ctrl + Enter (last edited value remains) or pressing Esc (last edited value resets).

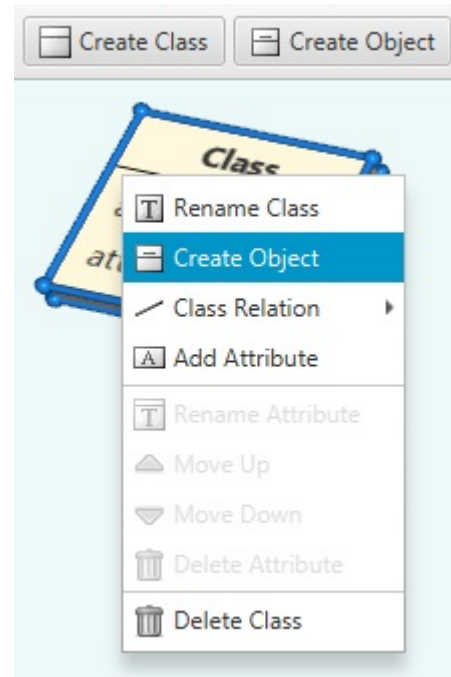


Figure 11: Creating an object.

6.3.2. Move Object

Objects can be moved vertically (y-axis) by dragging and dropping them along a blue guide track.

6.3.3. Rename Object

An object can be renamed by double clicking the name field or by selecting the „Rename Object“ menu item from the object context menu.

Object renaming is finished by pressing Enter or deselecting the name field. The process can be aborted with Esc and the name change is reverted.

6.3.4. Set Value

An attribute value can be set or changed with a double click on the label or by selecting it and then choosing the context menu item „Set Value“.

6.3.5. Delete Value

Selected attribute values can be deleted by either pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Value“ menu item in the object context menu.

6.3.6. Color Object

The color of a selected object can be changed by choosing a color from the colorpicker in the toolbar.

6.3.7. Delete Object

A selected object can be deleted by either pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Object“ menu item in the object context menu.

6.4. Relation Interaction

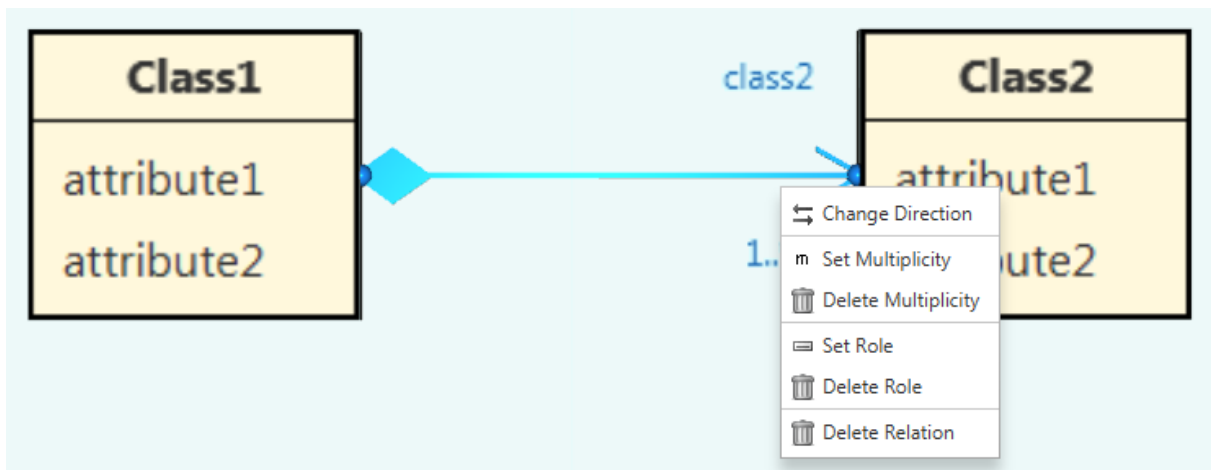


Figure 12: Relation context menu. Menu was opened close to the target of the relation.

6.4.1. Create Class Relation

There are two ways of creating a class relation. The creation process can be aborted with the Esc key:

- „Class Relation“ button in the toolbar:
 - 1) Click the dropdown arrow on the right side of the “Class Relation” button and choose the relation you want to create .
 - 2) Toggle the “Class Relation” button. The cursor becomes a crosshair in the 3D scene.
 - 3) Choose a source class: All possible source classes show a blue frame on mouse hover.
 - 4) Choose a target class: All possible target classes show a blue frame on mouse hover.

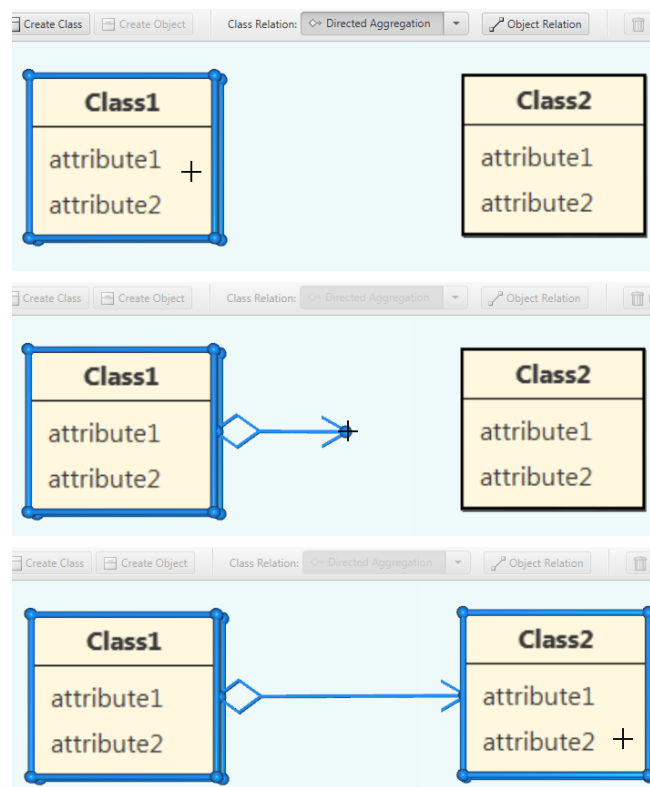


Figure 13: The steps of relation creation.

- Context menu item „Class Relation“:
 - 1) Select the class you want to use as the source of the relation.
 - 2) Open the class context menu with a right click.
 - 3) Hover the menu item „Class Relation“ and choose the relation you want to create.
 - 4) The mouse cursor will become a crosshair: Choose a target class. All possible target classes show a blue frame on mouse hover.

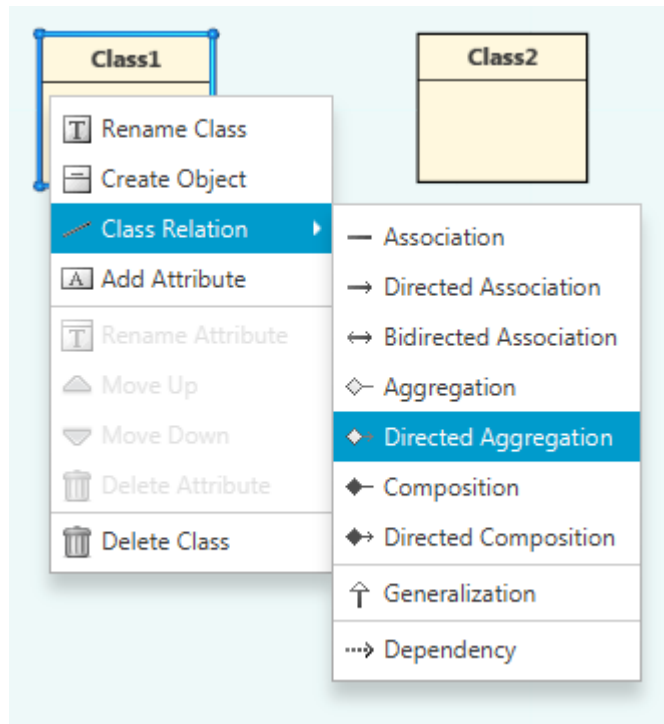


Figure 14: Choosing a "Class Relation" from the class context menu.

6.4.2. Create Object Relation

There are two ways of creating an object relation. The creation process can be aborted with the Esc key:

- „Object Relation“ button in the toolbar:
 - 1) Toggle the “Object Relation” button. The cursor becomes a crosshair in the 3D scene.
 - 2) Choose a source object: All possible source objects show a blue frame on mouse hover.
 - 3) Choose a target object: All possible target objects show a blue frame on mouse hover.
Note that the classes of the objects you want to connect need to be connected beforehand with a relation other than „Generalization“ or „Dependency“.
- Context menu item „Object Relation“:
 - 1) Select the object you want have as source of the relation.
 - 2) Open the object context menu with a right click.
 - 3) Choose the menu item “Object Relation”.
 - 4) The mouse cursor will become a crosshair: Choose a target object. All possible target objects show a blue frame on mouse hover.

6.4.3. Change Direction

(Class Relation only)

To reverse the direction of a selected class relation, choose the „Change Direction“ menu item in the relation context menu.

6.4.4. Set Multiplicity

(Class Relation only)

The multiplicities of a relation can be set or changed with a double click on the label (if it exists) or by opening the relation context menu close to the source or target class and then choosing the context menu item „Set Multiplicity“.

Note that multiplicities need to be in a correct form. The biggest value of a multiplicity is defining the number of allocated fields of an array in the “Object Graph Mode”.

6.4.5. Delete Multiplicity

(Class Relation only)

Multiplicities can be deleted by either selecting the label and then pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Multiplicity“ menu item in the relation context menu. The context menu has to be opened close to the desired source or target class.

6.4.6. Set Role

(Class Relation only)

The roles of a relation can be set or changed with a double click on the label (if it exists) or by opening the relation context menu close to the source or target class and then choosing the context menu item „Set Role“.

Note that roles define the attribute names of the source objects in the “Object Graph Mode”.

6.4.7. Delete Role

(Class Relation only)

Roles can be deleted by either selecting the label and then pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Role“ menu item in the relation context menu. The context menu has to be opened close to the desired source or target class.

6.4.8. Color Relation

The color of a selected relation can be changed by choosing a color from the colorpicker in the toolbar.

Note that by choosing same colors for class relations and relevant object relations, it can be defined which of those relations belong together. This is only needed by multiple or bidirectional class relations and for the „Object Graph Mode“.

6.4.9. Delete Relation

A selected relation can be deleted by either pressing the „Delete Selected“ button in the toolbar or by choosing the „Delete Relation“ menu item in the relation context menu.

Note that if a class relation is deleted, relevant object relations of same color are deleted as well.

6.5. Object Graph Mode

The user can display the Object Graph by clicking the „Object Graph Mode“ button to the right in the toolbar.

The following restrictions are in effect:

- Can only be enabled when „Show Objects“ is checked.
- The view is read-only: Classes, Objects and Relations can not be edited or moved.
- Undirected „Associations“ are treated the same as „Directed Associations“. The direction the association was created in controls source and target classes. For bidirected relations use either „Bidirected Associations“ or two „Directed Associations“ (See Figure 15).
- The order in which relations are created in the class and object diagram define the order in Object Graph arrays.

Example 1:

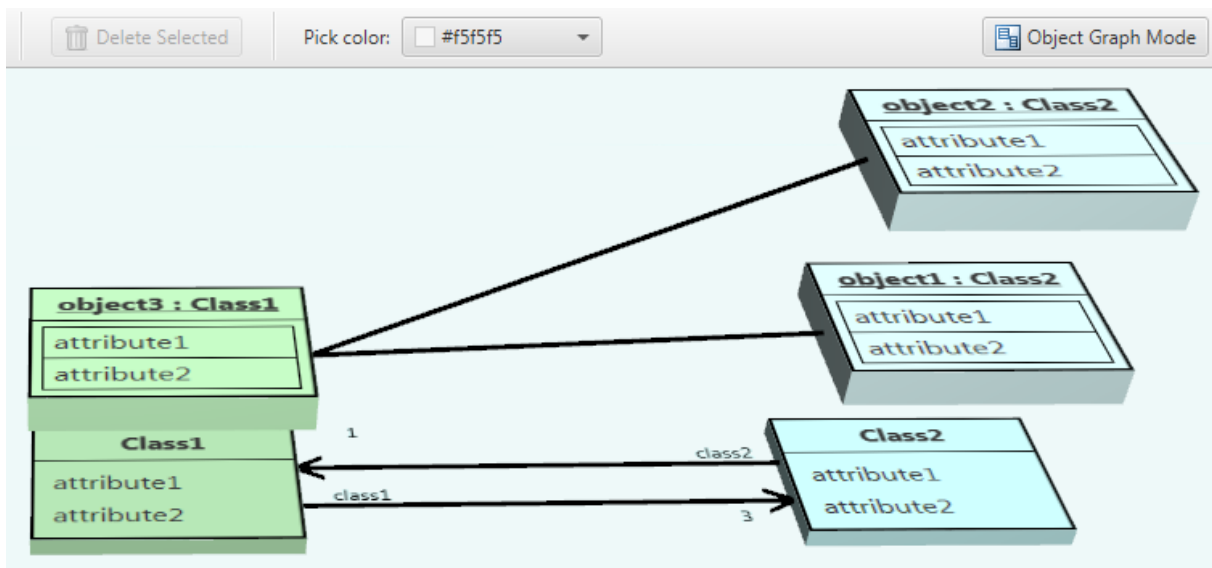


Figure 15: Class / Object Diagram Example 1.

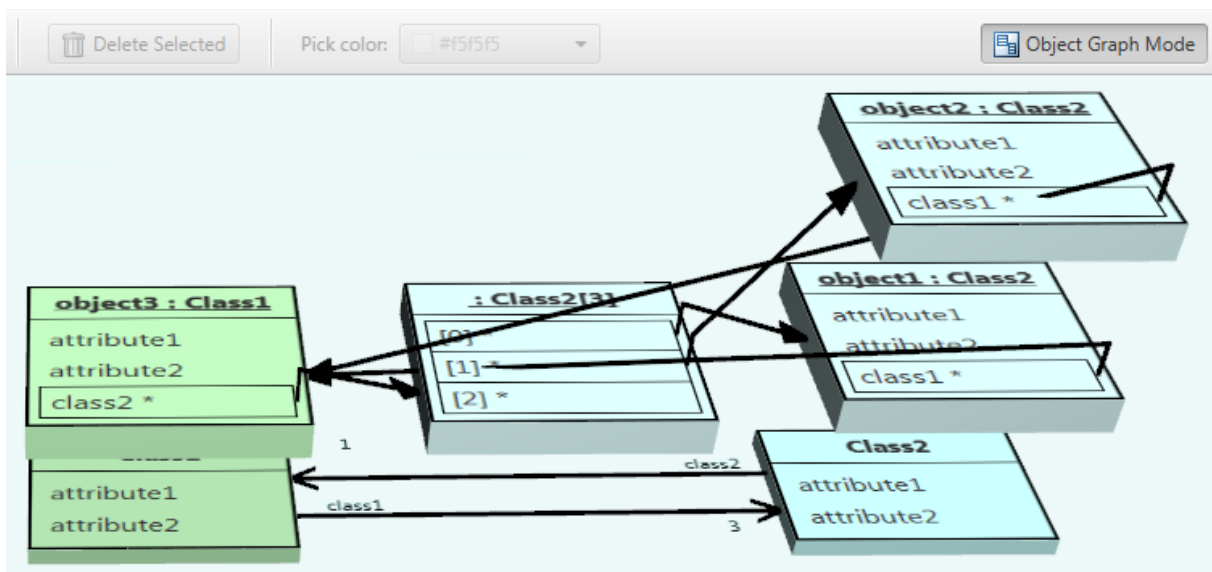


Figure 16: Object Graph resulting from situation described in „Example 1“ and shown in "Figure 15".

Figure 15 shows a Class- / Object Diagram. „Class1“ (green) and „Class2“ (blue) are connected with two „Directed Associations“. The bottommost class relation has „Class2“ as target and a role „class2“ and multiplicity „3“ at target side. The topmost class relation has „Class1“ as target, the target role „class1“ and target multiplicity „1“. All relations are black. Figure 16 shows the resulting Object Graph.

Example 2:

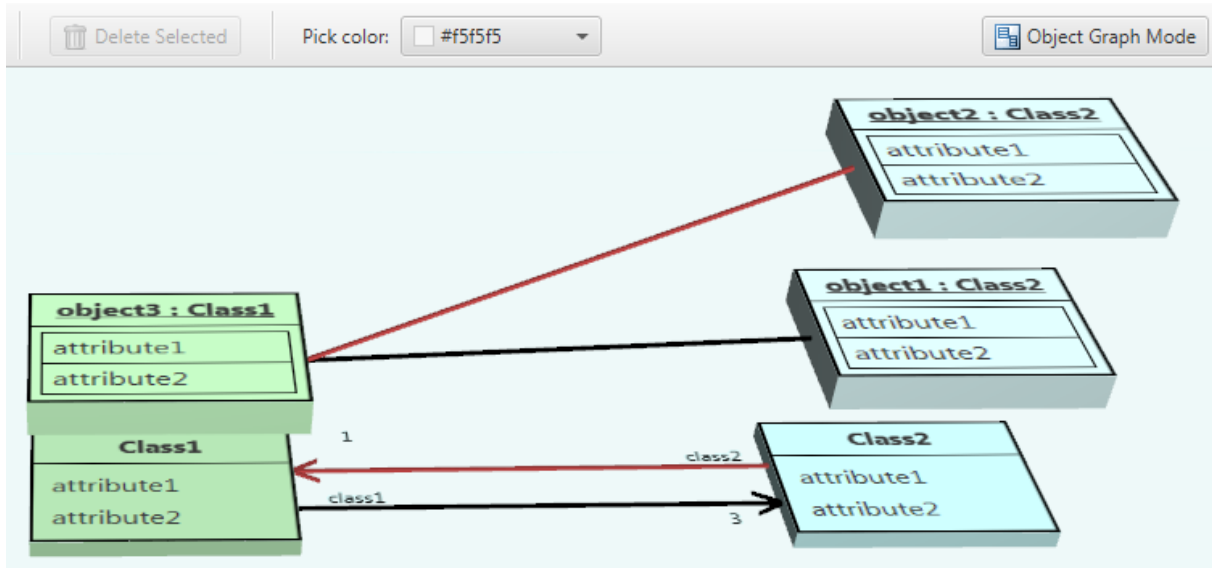


Figure 17: Class / Object Diagram Example 2.

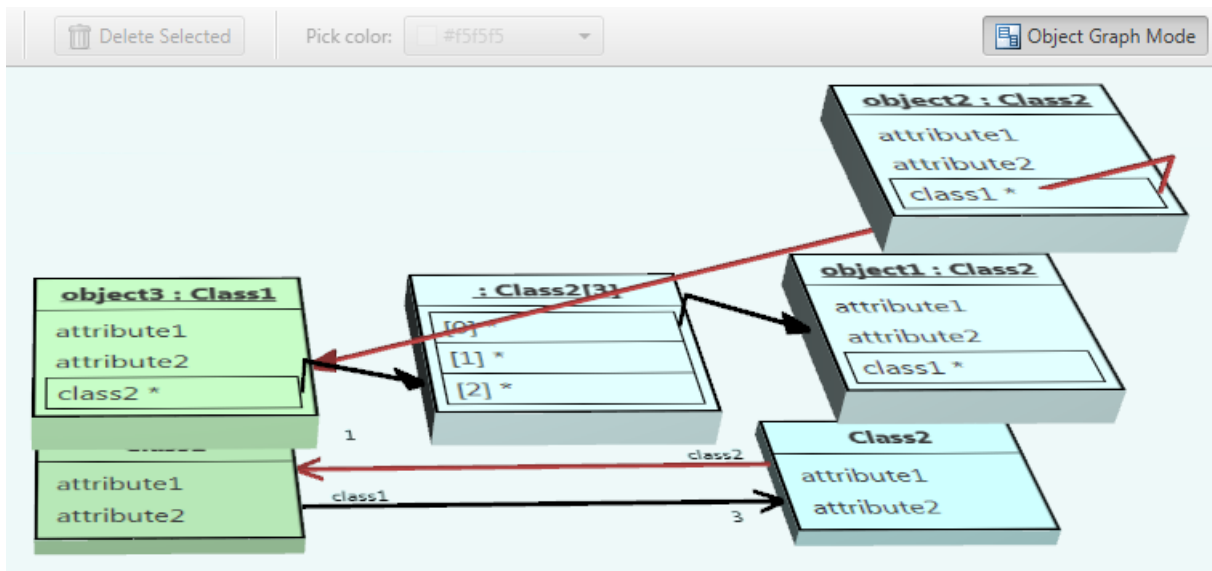


Figure 18: Object Graph resulting from the situation described in „Example 2“ and shown in "Figure 17".

Figure 17 shows the same diagram as described in „Example 1“ except that both the topmost class relation and object relation are both red (the same color code). With this coloring, the Object Graph will know which class relations and object relations belong together, as shown in Figure 18.

6.6. Shortcuts

Following keyboard shortcuts are defined:

Button Combination	Condition	Effect	Chapter
Arrow Keys	Not Renaming	Move Camera	5.
Ctrl + Move Camera	-	Slower Move Camera	5.
Ctrl + Rotate Camera	Not Locked Top View	Slower Rotate Camera	5.
Ctrl + Zoom	-	Slower Zoom	5.
Shift + Move Camera	-	Faster Move Camera	5.
Shift + Rotate Camera	-	Faster Rotate Camera	5.
Shift + Zoom	-	Faster Zoom	5.
Ctrl + N	Not in Object Graph Mode	New	4.1.1.
Ctrl + O	-	Open	4.1.2
Ctrl + I	-	Import XML...	4.1.3
Ctrl + S	-	Save	4.1.4
Ctrl + Shift + S	-	Save As...	4.1.5
Alt + F4	-	Exit	4.1.6
Z	-	Center View	4.2.1
T	-	Locked Top View	4.2.2
V	Not in Object Graph Mode	Show Objects	4.2.3
X	-	Show Model Axis	4.2.4
C	Focus on floor or background	Create Class	6.2.1
O	Class selected	Create Object	6.3.1
Delete	- Attribute selected	Delete Selected	6.2.8
	- Class selected		6.2.10
	- Value selected		6.3.5
	- Object selected		6.3.7
	- Multiplicity selected		6.4.5
	- Role selected		6.4.7
	- Relation selected		6.4.9

Table 1: Shortcuts

6.7. Troubleshooting

6.7.1. The application is not starting

Make sure an appropriate version of the Java Runtime (JRE) is installed, version 8u45 or newer (see „Chapter 2: Installation“): <https://java.com/de/download/>

If the problem persists, try to start the application from a terminal.

6.7.2. Blurry fonts or rendering artifacts

This could be a general JavaFX application problem. Try running the application from your terminal / command prompt with following arguments:

```
java -Dprism.text=t2k  
java -Dprism.lcdtext=false
```

Another solution might be increasing the Java Virtual Machine heap memory:

```
java -Xms=512m -Xmx=512m (or bigger values)
```

6.8. Known Issues

6.8.1. Mouse Click Registering

Mouse clicks only register when the mouse is not being moved.

6.8.2. Inherited Relations

Object relations are not drawn in the Object Graph Mode even if they should be (because their classes are linked by superclasses).

6.8.3. Persisting Inheriting Object Values

Attribute values inherited from other objects are not saved.