
A Sequence Diagram Editor for BlueJ

A User Manual

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Chapter 1

User Manual

In this user manual it is described how the editor works and how to use it. The manual contains both a tutorial and sections about each functionality. After a short introduction the tutorial follows. After this each functionality of the editor is described and explained in more detail.

Menu: File & Option

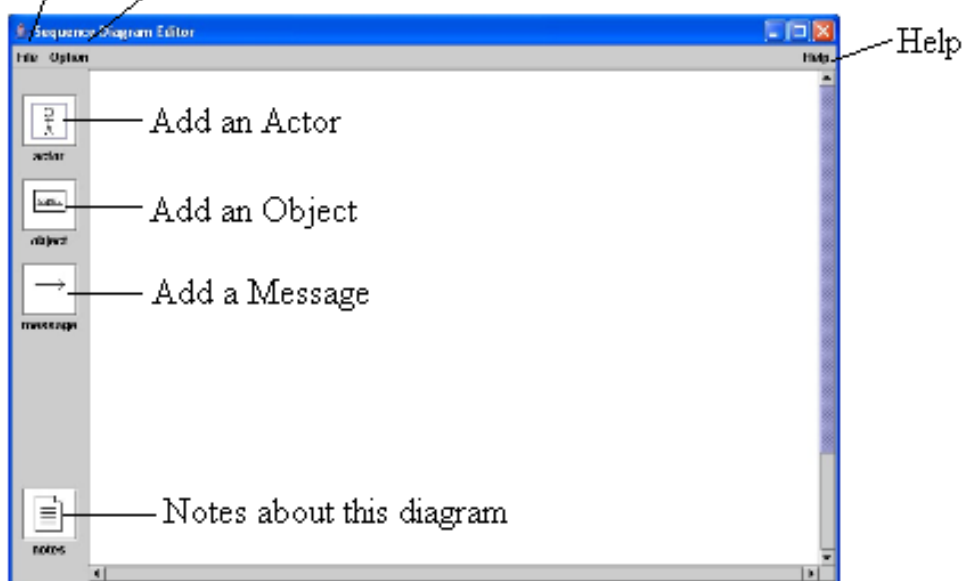


Figure 1.1: A view of the editor with descriptions for the most important functions.

1.1 Introduction

This appendix will help the user to install and use the sequence diagram editor. Since the BlueJ program is a project still under development the plugin will only work together with the version 1.3.0 or later versions. To be able to run BlueJ and the plugin you will also need JDK version 1.4.2 or later installed on your computer.

1.2 Installation of the Plugin

To install the editor as a plugin for BlueJ copy the Jar file `Meditor.jar` into the `lib/extension` directory of your BlueJ installation. Next time BlueJ is started the plugin will appear in the menu of the BlueJ application.

1.3 Starting the Plugin

If the editor is started as a plugin to BlueJ it is started from the menu in BlueJ. Choose *tools* → *Sequence Diagram Editor* to start the editor.

If the editor is started without BlueJ the jar-file is executed to start the editor.

1.4 A Tutorial, Creation of a Sequence Diagram

When the editor has been installed and started a sequence diagram can be created. This tutorial will illustrate when the editor is in BlueJ-mode using a project called “people2” which comes as an example with the BlueJ program. The scenario described in the sequence diagram will display a secretary registering a new student adding him or her to the database.

First an actor is added to the sequence diagram. This is done by clicking on the icon for an actor, see figure 1.1. The name of the actor is then changed to “Secretary” by double clicking on the actor or by choosing from the menu. The menu of the actor is shown by clicking on the actor with the right mouse button.

Next step in the sequence diagram is the creation of a new student. The “Secretary” will create a new student to add to the database. This is done by first choosing to add a new message to the diagram, see 1.1. Mark the start for the message on the lifeline of the actor (“Secretary”). Then click with the right mouse button and the editor will ask if “*Do you want to create a new object with this message?*”. Answering yes will create a new object. First choose which class the object should be created from and then write the name of the object, see figure 1.6. The sequence diagram will now look as in figure 1.2.

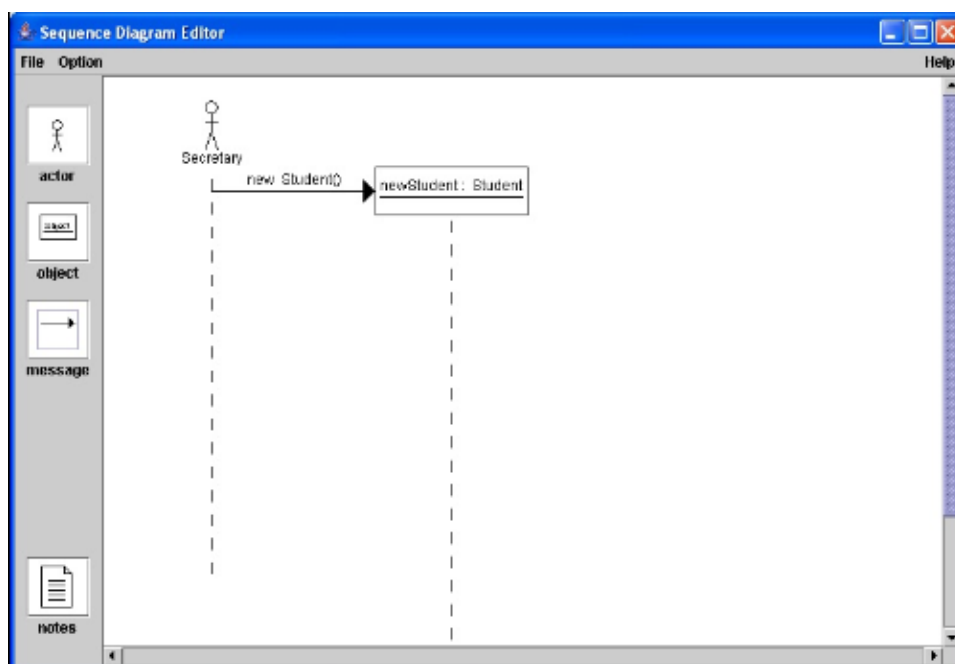


Figure 1.2: The actor and the new student have been added to the sequence diagram.

Next step will be that the Secretary sets the address of the new student. This is done by making a call to the method “setAddress” which the student has inherited from its super class Person. The message call is made by first choosing to add a new message. First click on the lifeline of the actor, who will make the method call, then click on the lifeline of the student to which the call is made. Then choose which method to use in the drop down list and click “OK”. The diagram will now look as in figure 1.3.

When a message is added to a sequence diagram the default in the editor is that the message gets a return message. If the type of the return value is known it will be added to the return message. Return messages can be switched on and off in the menu under *option* → *show return messages*. This could be done any time during the development of the diagram.

If a message has been added to a sequence diagram and the position of it is not satisfactory the message can be moved. This is done by selecting the message, by clicking on it, and then click on the handle¹ of the message and hold the left mouse button down and drag the message to the right position.

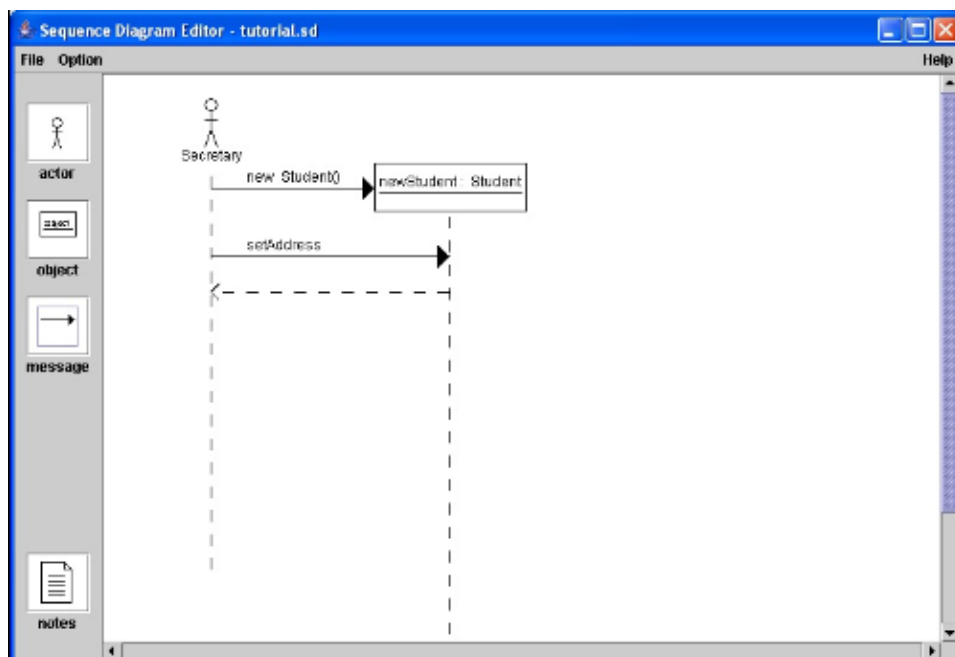


Figure 1.3: The actor and the new student have been added to the sequence diagram. The actor calls the method “setAddress” to let the student set its address.

¹ A little square that will appear when the message has been selected.

When the method “setAddress” is called on the student it creates a new object of the class Address and sets its own address. This has to be displayed in the sequence diagram by letting the student create a new object of the class Address before returning the method call to setAddress, done by the actor. This is done by choosing to add a new message. Mark the start point of the method call on the lifeline of the student, since it is the student creating the new Address. To clarify that the new Address is created before the method call to “setAddress” returns the start point of the message should be placed between the endpoint of the “setAddress”-message and the return message belonging to it. Then create a new object from the class Address as described before. The look of the diagram will now be as in figure 1.4.

If a message, an actor, or an object has been added to the diagram but should be deleted this is done by clicking on the component with the right mouse button and a menu will appear. Just choose “delete” from the menu and the component will be deleted from the sequence diagram.

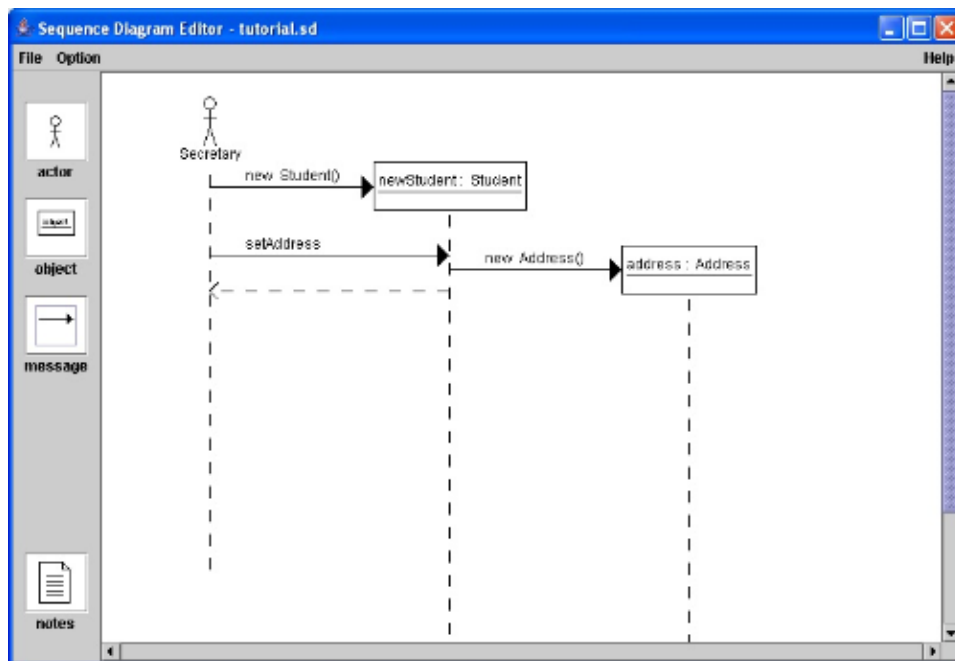


Figure 1.4: The student creates a new object of the class Address to be able to set its own address.

Next and last step in the sequence diagram will be the Secretary adding the new student to the database. First we have to add an object of the class Database to the sequence diagram. This is done by choosing to add a new object to the diagram by clicking on the icon for an object, see figure 1.1. Then choose which class to create the object from and write the name of the new object, see figure 1.6. Now the Secretary adds the new student to the Database by calling the method “addPerson” in the database. To add this method call into the diagram first choose to add a new message, click on the lifeline of the actor and then click on the lifeline of the database. Then choose which method in the list (“addPerson”) and click “OK”. The diagram will now look as in figure 1.5.

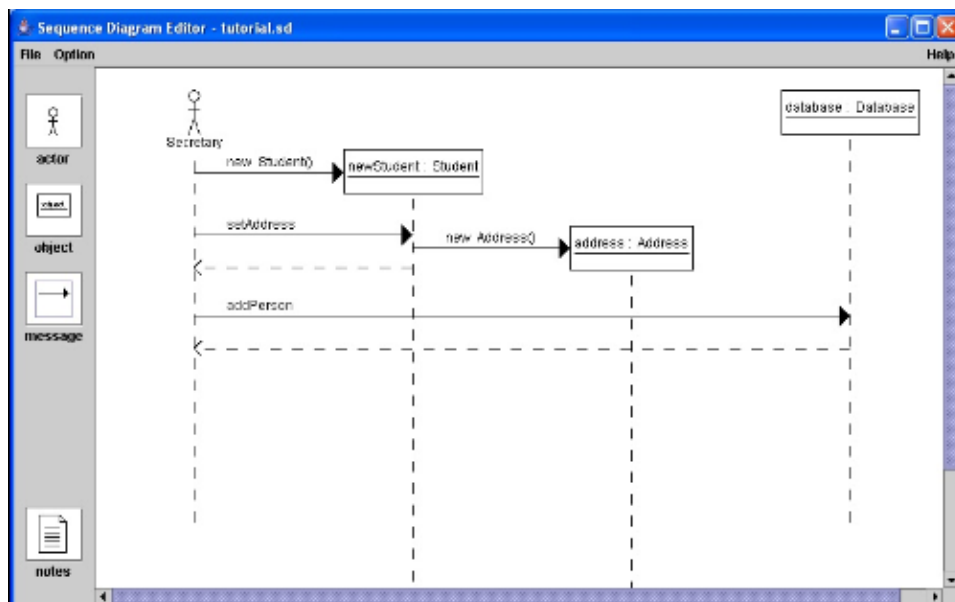


Figure 1.5: The finished sequence diagram.

Now the sequence diagram is complete and all objects and messages have been added. If the diagram has not been saved yet this is done by either pressing Ctrl-S or choosing save / save as from the file menu. The name of the sequence diagram is typed and then click “OK”, see figure 1.9. The file of the diagram will be saved in the same directory as the project it belongs to, that is, the currently open project in BlueJ.

1.5 Adding Components to a Sequence Diagram

If the editor is started the user can choose to create a new sequence diagram or open a saved one. To create a new sequence diagram the diagram is drawn in the drawing area and later saved under the menu *file* → *save as*. Otherwise a saved sequence diagram is opened using the menu *file* → *open*.

1.5.1 Adding an Actor

To add an actor to the sequence diagram just click on the icon for an actor, see figure 1.1, and an actor will be added to the drawing area.

1.5.2 Adding an Object

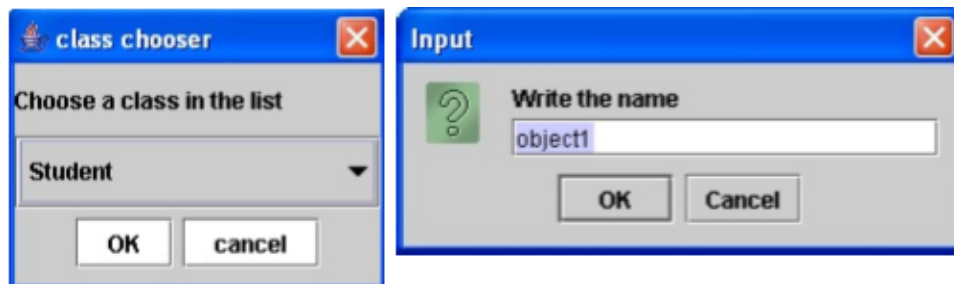


Figure 1.6: If the editor is in BlueJ-mode the user first has to choose the class of the new object (the window to the left) and then the name of the object (the window to the right).

To add an object to the sequence diagram click on the icon for an object, see figure 1.1. If the editor is in BlueJ-mode the class of the object first has to be chosen, see figure 1.6. This is done by selecting one of the classes in the list and then click on the “OK”-button. After this the user has to fill in the name of the new object. If a new name is not given the object will be given a default name like “object1”.

1.5.3 Adding a Message

To add a message to the sequence diagram click on the icon for a message, see figure 1.1. To select the start object of the message, meaning the object making the method call *to* the end object, click on the lifeline on this object (or actor). To select the end object of the message click on the lifeline of this object. If the editor is in BlueJ-mode the user has to choose a method. This is done by selecting one



Figure 1.7: If the editor is in BlueJ-mode and a message is added the user has to choose which method to add by selecting one from the list.

method in the list and click on the “OK”-button, see figure 1.7. If the option “Show return messages” is selected in the menu under *option* each added message will get a return message belonging to it. If the return message has a type this will be added as a label to the return message.

1.5.4 Adding a Destroy Symbol

A destroy symbol can be added to an object or to an actor. This is done by clicking on the object or actor with the right mouse button and a popup menu will appear. The destroy symbol is added by selecting *create destroysymbol* in the menu and then click on the lifeline of the object or actor where the destroy symbol should be placed.

1.5.5 Notes about the Sequence Diagram

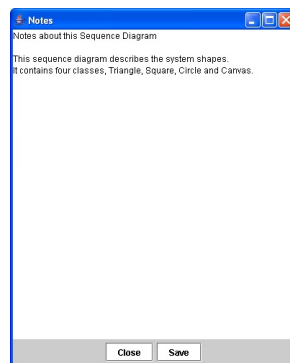


Figure 1.8: The window where the user can write notes belonging to a sequence diagram.

Each sequence diagram has a note (a text field) belonging to it. The note can

contain information about the diagram for example if the user wants to point out something special about the diagram, a general description of the scenario etc, he or she can write it here. To write notes for a sequence diagram just click on the icon for notes, see figure 1.1. Then a window will appear, see figure 1.8, where the notes can be written. Before closing the window click on the *save* button and the notes will be saved together with the sequence diagram.

1.5.6 Return Messages

Every message that is added to a sequence diagram will automatically get a return message. If the editor is in BlueJ-mode the type of the return message will be added as the label of the return message. The user can choose whether to display the return messages or not. This is done under *option* → *Show return messages*. Return messages can be switched on and off during the development of a sequence diagram.

A message having the same object as its start and end object will not get a return message.

1.5.7 Creation of a sequence

Messages added to a sequence diagram can be arranged in a sequence. All messages, including return messages, in a sequence will automatically be arranged with the same distance between them. If a message in a sequence is removed the messages after the removed message will be removed from the sequence.

To add message-M2 to a sequence after message-M1 message-M2's start point has to be placed between message-M1's endpoint and its return message. If this is done message-M2 will be added to the sequence and all messages and return messages in the sequence will automatically be arranged.

1.6 Save and Open a Sequence Diagram

To save a sequence diagram chose *file* → *save as / save*. If the editor is in BlueJ-mode only the filename has to be filled in, see figure 1.9. The file of the sequence diagram will be saved in the same directory as the project it belongs to. If the editor is not in BlueJ-mode the user chooses the name of the file and the directory where the file should be saved. To save a sequence diagram the user can also press **Ctrl-S**.

To open a saved sequence diagram choose *file* → *open*. Then choose which file to open and click OK. If the editor is in BlueJ-mode only the files belonging

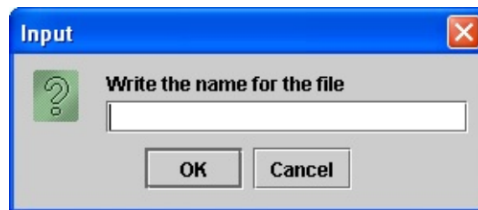


Figure 1.9: If the editor is in BlueJ-mode and the sequence diagram should be saved the user just has to fill in the name of the file

to the currently open project are shown. To open a sequence diagram the keyboard can be used by pressing `Ctrl-O`.

1.7 Moving, Deleting and Editing

1.7.1 Objects

Delete To delete an object click on the object with the right mouse button and choose *delete* from the popup menu. When deleting an object all attributes belonging to it will also be deleted, such as messages, destroy symbol, life-line etc.

Rename An object can be renamed in two different ways. The name can be changed via the menu that appears when the object is clicked on with the right mouse button. The name can also be changed by double clicking on the object.

Move To move an object first select the object by clicking on it. The object will then be drawn in red and a handle (a small square) will appear. To move the object click on the handle and “drag” the object (with the left mouse button pressed down) to the new position. When the mouse is released all objects and actors in the sequence diagram will be rearranged automatically and the distance between them will be the same.

1.7.2 Actors

Delete To delete an actor click on the actor with the right mouse button and choose *delete* from the popup menu. If an actor is deleted, all attributes belonging to it, like messages, destroy symbol, lifeline etc. will also be deleted.

Rename An actor can be renamed in two different ways. The name can be changed

via the menu that appears when the actor is clicked on with the right mouse button. The name can also be changed by double clicking on the actor.

Move To move an actor, first mark it by clicking on the actor. The actor will then be drawn in red and a handle (a small square) will appear. To move the actor click on the handle and “drag” the actor (with the left mouse button pressed down) to the new position.

1.7.3 Messages

Delete To delete a message click on the message with the right mouse button and choose *delete* from the popup menu. The message will then be deleted. If the message has a return message this return message will also be deleted.

Rename There are two ways to rename a message. The message can be renamed by clicking on the message with the right mouse button and choose *change message* from the popup menu. The message can also be changed by double clicking on it. Return messages can also be renamed in the same way.

Move If a message is selected by clicking on it a handle appears. By clicking on this handle and dragging it, the message (or return message) can be moved vertically.

Creation message If a message is to create a new object this is done by first selecting the start object for the message, the object that is going to create the new object. Then click with the right mouse button and the editor will let the user choose which new object to create. The new object will then be added to the sequence diagram.

1.7.4 Destroy Symbol

Delete To delete a destroy symbol click on it with the right mouse button and choose *delete* from the popup menu.

Move To move a destroy symbol select it by clicking on it. The destroy symbol will then be drawn in red and a handle will appear in the middle. To move the destroy symbol click on the handle and “drag” the destroy symbol (with the left mouse button down) to the new position. The destroy symbol can only be moved up or down along the lifeline it belongs to.

1.7.5 Lifeline

The length of a lifeline can be changed. To change the lifeline first mark it by clicking on it. The lifeline will then be drawn in red and a handle will appear at

the end of the lifeline. To change the length of the lifeline click on the handle and “drag” the handle to the new position for the end of the lifeline. The handle can only be moved vertical along the lifeline.

1.8 Known Bugs

There are a number of known bugs in the editor and surely a number of unknown too. Since the program still needs some adjustments and more functionality there are some features left to implement. One of the biggest bug is that the program is not all “waterproofed”, it is not that hard to have it crash. If the editor is correctly used it works OK, but if the user starts to “test” the program there will probably happen strange things.

The known bugs in the editor are:

Sequences If a sequence contains two messages which are messages back to the same object in a row this will cause problems. New messages can only be added at the end of the sequence and not in the middle of an already existing sequence.

Consistency check When a sequence diagram is opened it is checked against a BlueJ project. But only classes are checked and not methods.

Moving components Sometimes when different objects or actors are rearranged in the drawing area all attributes belonging to them do not get the correct new position.

Creation messages A creation message can not be in a sequence of messages.

Return messages When a regular message is added to the sequence diagram it gets a return message placed in the right position. But later on the user can move this return message to any position without any control from the editor.

Inheritance If a classA inherits from classB, all classB’s public methods are also shown for classA. But if classB inherits from classC, classC’s public methods should be shown for classA which is not the case. The inheritance is just shown in one step in the editor.