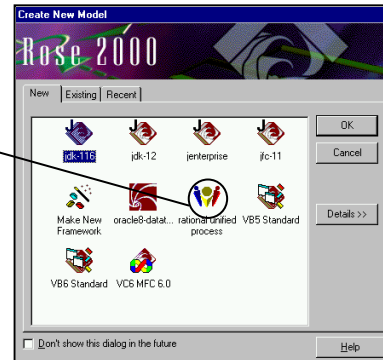


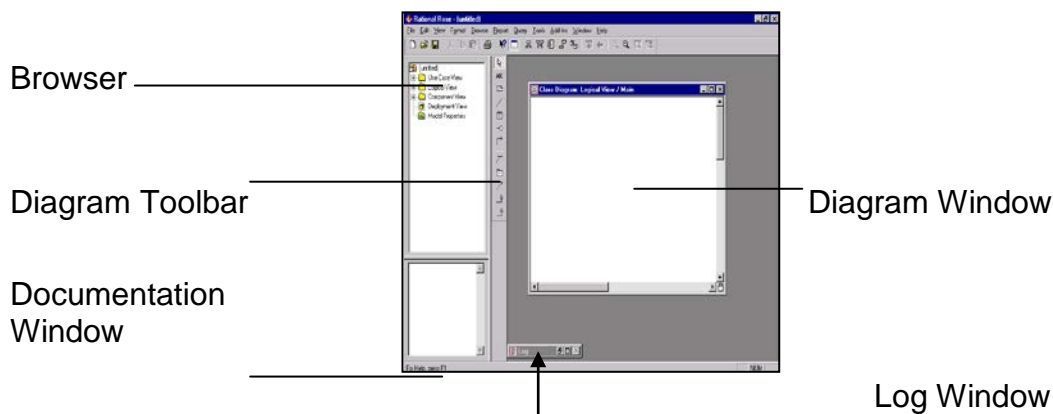
Rational Rose 7.0

To open Rational Rose go to **Programs IBM Rational Rose Enterprise Edition**. Once Rational Rose is open you are presented with a dialogue box. This gives you the option to create a **New Model**.

Select **Rational Unified Process**



Once you have opened a new file. Your interface will be as below.



Browser

The browser works a lot like Windows Explorer to help you organise file and folders and displays the elements that you've modelled.

Documentation Window

This is used to create, view, or modify text explaining a selected item.

Diagram Window

Allows you to create, update, and model graphical views of the current model.

Diagram Toolbar

Is unique to each diagram type and can be customised and it is only active when a diagram is displayed.

Log Window

Reports progress, results, and errors.

Rational Rose models eight diagrams. These are: -

- Use Case State Chart
- Collaboration Activity
- Sequence Component
- Class Deployment

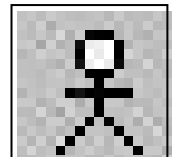
How to create Use Case diagrams

Use Case diagrams represent a high level view of the system from the User's point of view.

1. In the browser, right click on **Use Case View** and select **New**. Left click to select **Use Case Diagram**.
2. Rename, and double click to select. Expand Diagram window (if necessary).

To add actors:

1. From diagram toolbar, left click on **Actor** icon and position pointer where the actor is required on the diagram window, left click again.



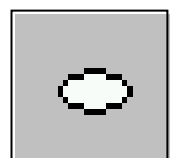
NOTE: Actors can be repositioned later by left clicking and dragging as required.

2. Re-name Actor by double clicking and changing name within appropriate field.

NOTE: Multiple actors can be positioned one after the other by holding down the shift key and selecting Actor icon and left clicking onto diagram window (release the shift key and click in order to drop the last Actor).

Adding Use cases:

1. From diagram toolbar, left click on **Use Case** icon to select and left click on Diagram window in required position.

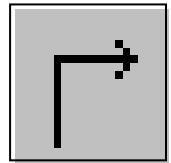


NOTE: Multiple use cases can be selected in the same way as the actors by holding down the shift key.

2. Double click on **New Use Case** or right mouse click and select **Open Specification**:
 - a) Add name.
 - b) Ignore stereotype box for now
 - c) In documentation, type a description of the use case.
 - d) Repeat for all the Use Cases.

Adding Flows

1. From the toolbar select the **Unidirectional Association** icon. Left click and drag from the appropriate Actor to the Use Case. Repeat to connect each actor to at least one Use Case.



2. Select the **Unidirectional Association** icon to link Use Cases back to Actors where the documentation flow requires this to be done.

Although it is not always possible, try to design your Use Case Diagram without any crossing associations.

3. Reposition the Actors or Use Cases as required.

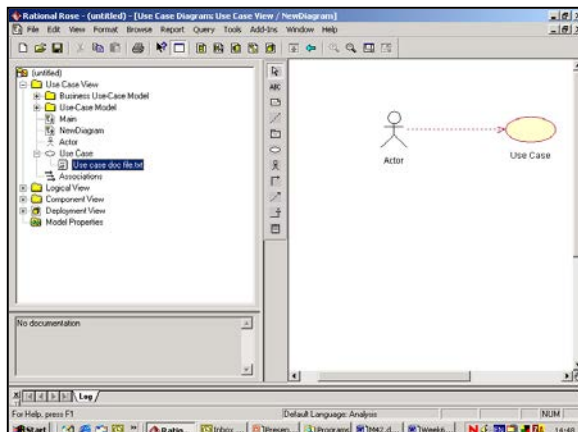
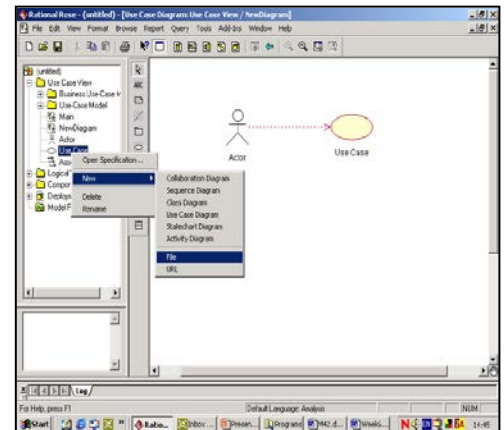
Adding a system boundary:

1. You cannot do this in Rational Rose; it is assumed that anything outside the system would not appear on the model.

Use Case Documentation

You cannot create use case documentation within Rational Rose. However, you can produce the documentation for a use case within Word or Notepad. Documentation for a use case diagram should be saved as separate files. The reason being, you can link a use case in Rational Rose to the Use Case documentation file you have created.

1. Create your use case diagram using the previous instructions.
2. Save your diagram.
3. In the browser select the **use case** for which you have created the use case documentation. Make sure it is the use case you select not the diagram as a whole.
4. Right mouse click and select **New**, followed by **File**.
5. Browse for the use case documentation file for that use case.



6. The name of the documentation file will appear beneath the use case.

Extra features:

1. Use Cases can be in-filled with colour by shift clicking all the Use Cases that you want to colour, then right-click:
 - a) Click Fill Colour
 - b) Click colour choice, then click OK.

Saving your work:

1. Go to **File, Save As**, and give a name for the file.

Loading Models:

1. Go to **File**, and then select **Open**.
2. Ensure that the file type is set to **mdl**
3. Select the file name and click **Open**.

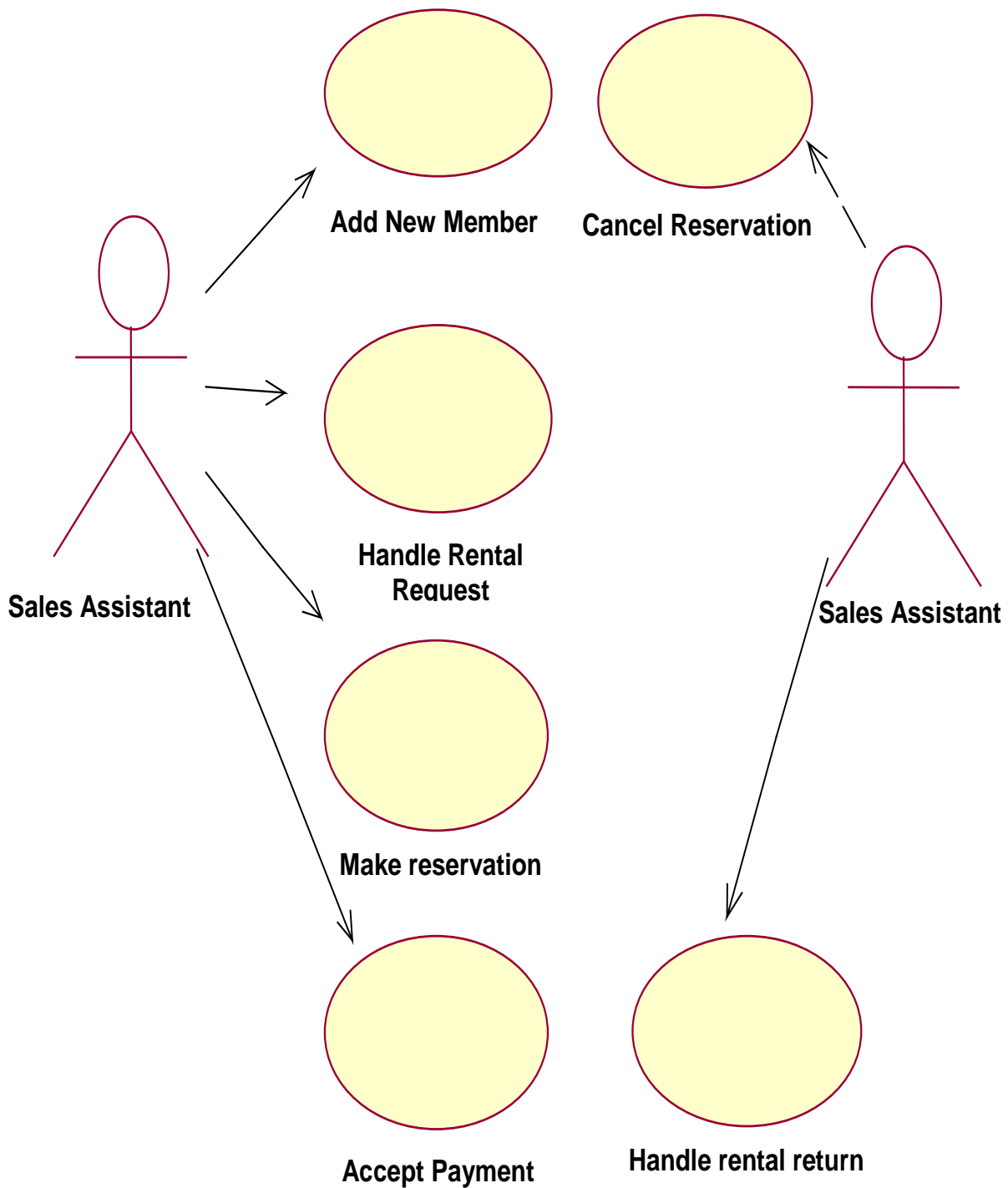
Final check:

In the browser, check your Use Case Model to ensure that all actors, use cases and relationships are accurate.

NOTE: If you delete something on the diagram it will still remain in the browser, if you delete from the browser the item will be removed automatically from the diagram as well.

TASK 1

Recreate this Use Case Diagram using Rational Rose.



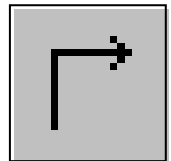
How to add Extends & Includes

Extend – An extend relationship from Use Case A to Use Case B indicates that an instance of Use Case B may be augmented by the behaviour specified by A.

Include – An include relationship from Use Case A to Use Case B indicates that an instance of the Use Case A will also contain the behaviour as specified by B.

Add Extends:

1. From the diagram toolbar, left click on **Unidirectional Association** icon to select.
2. Link the two Use Cases so that the arrow points to the extended Use Case.
3. Right-click on the created association, and then click on **Open Specification**.
4. From the **Stereotype** drop down menu select **extend** and click **OK**.

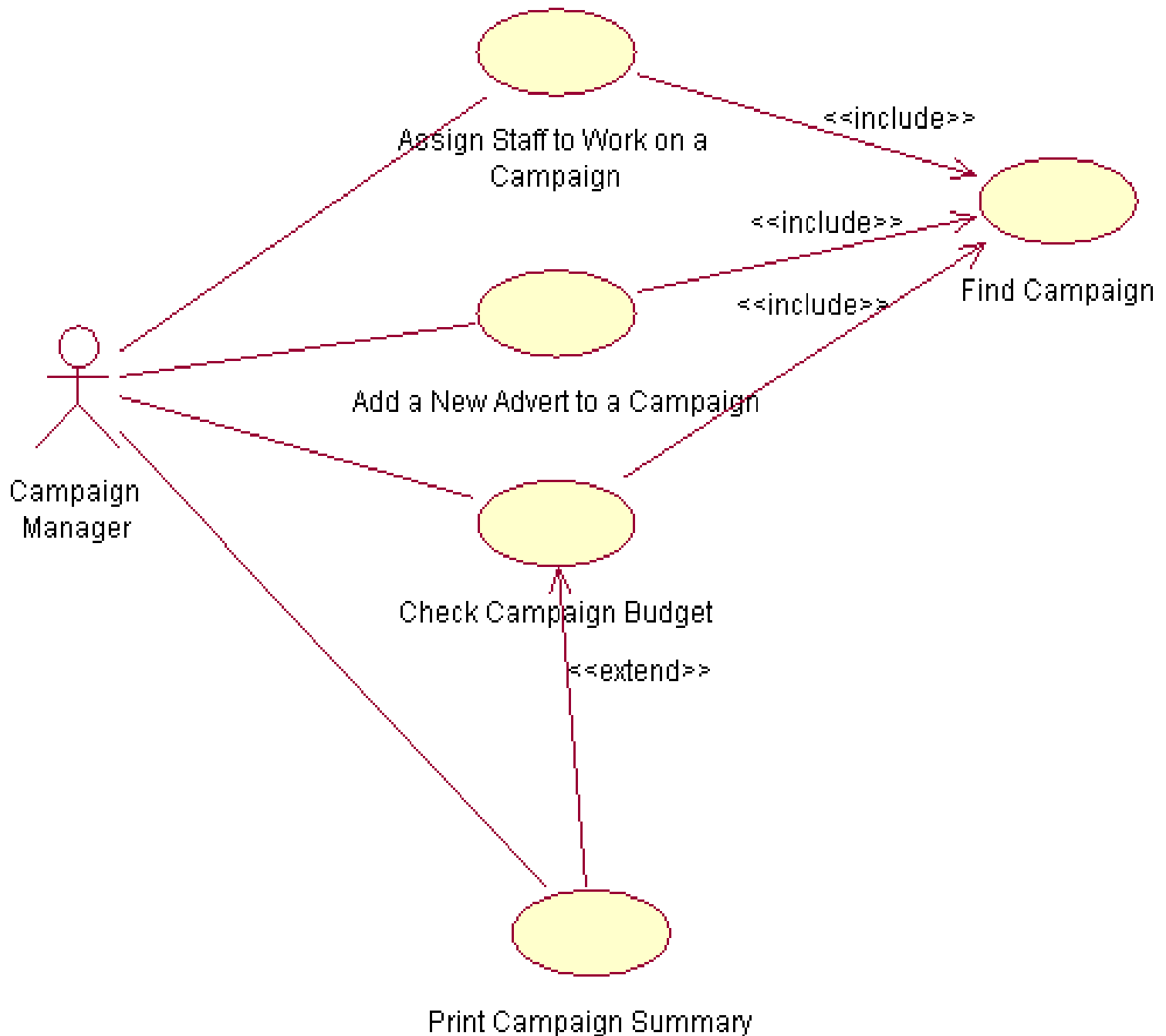


Add Includes:

1. From the diagram toolbar, left click on **Unidirectional Association** icon to select.
2. Link the two Use Cases so that the arrow points to the included Use Case.
3. Right-click on the created association, and then click on **Open Specification**.
4. From the **Stereotype** drop down menu select **include** and click **OK**.

Task 1

Recreate the following Use Case Diagram, which contains extends and includes using Rational Rose.

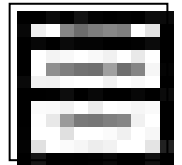


How to Create Class Diagrams

1. Expand **Logical View**.
2. In the browser, right click on **Logical View** and select **New**. Left click to select **Class Diagram**.
3. Rename, and double click to select. Maximise the Class Diagram window (if necessary).

Adding Classes:

1. From toolbar left click on **Class** icon and click again in Diagram window in required position.
2. Right click to select and click again to Open Specification:
 - a) Give Class an appropriate singular name.
 - b) Leave type as Class
 - c) Type brief Class details in the Documentation space.
3. Click **OK** to close.



Adding Attributes:

1. Right click the **Class** for which you want to add attributes, and select **New Attribute**. Type appropriate name. Press **Enter** to move to next attribute and then click anywhere in the Diagram window when complete.

Adding Operations:

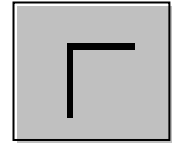
1. Right click the **Class** for which you want to add operation and select **New Operation**. Type appropriate name. Press **Enter** to move to next Operation and then click anywhere in the Diagram window when complete.

NOTE: attributes and operations can be deleted from the Class Specification.

Associations

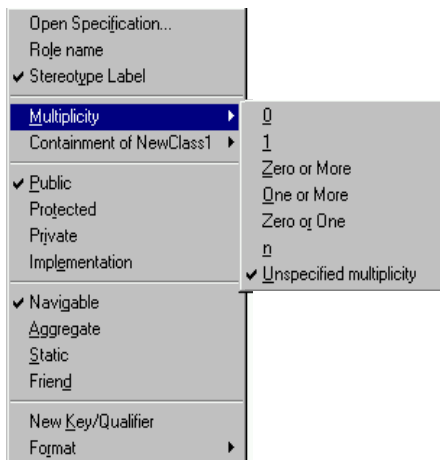
Adding Associations:

1. Click on the Association icon in the toolbar and link Classes as required.



NOTE: If this Button does not appear on your toolbar it can be added by Right clicking on the Toolbar, select Customise, Add appropriate button, and Close.

Adding Multiplicities:



1. Right click on one end of the **Association** and select **Multiplicity**
2. Click on 0, 1 etc and repeat for the other end of the line.

Adding an Association name:

1. Double click on association. A dialogue box will appear.
2. Select General tab and in the Name field enter the name of the association.

Creating Multiple Associations:

When you have two associations between classes or the same objects are related twice; a given object can be linked to different objects through each association. Each association is independent, and is distinguished by the role name.

Each end of an association is a **role** specifying the face that a class plays in the association. Each role must have a name, and the role names opposite a class must be unique.

1. Right click on **association**.
2. Select **Role name**, enter the role name.



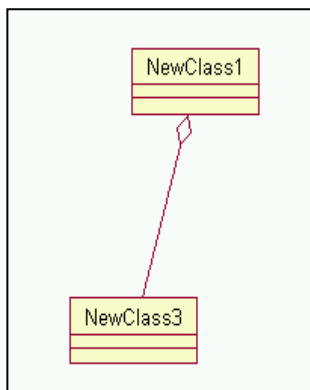
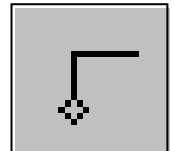
Navigability

1. To add Navigability to the association right click the **association** at the side to which the arrow should point.
2. Select **Navigable** and an arrow will appear on the association.

NOTE: UML represent navigability as a solid black arrow.

Adding Aggregation:

1. Click on the Aggregation icon in the toolbar and left click the whole class and drag to the part class.

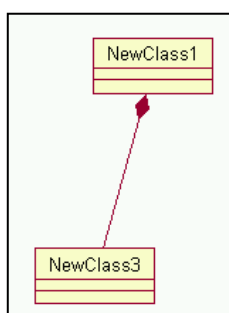


NOTE: The open diamond appears next to the class denoting the aggregate.

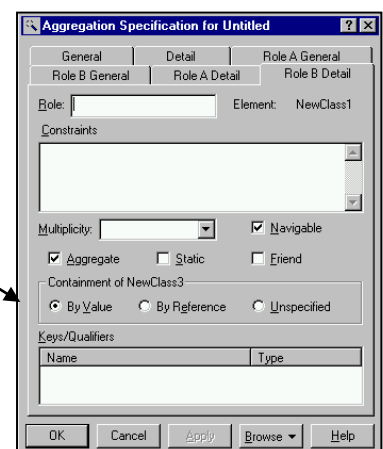
Adding Composition:

Composition relations in Rational Rose are created through the conversion of an aggregate relationship.

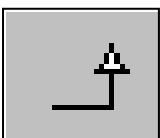
1. Create an aggregation between the two classes.
2. Right click the association and **Open Specification** select the correct tab relating to the end of the relationship, which is aggregate.
3. In Containment select **By Value**; this changes the Aggregate association to a Composition association.



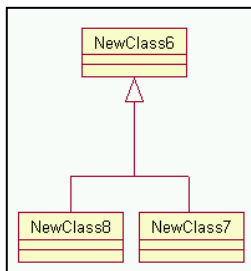
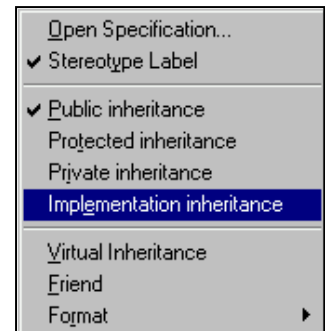
NOTE: The open diamond is now a solid diamond



Adding Inheritance

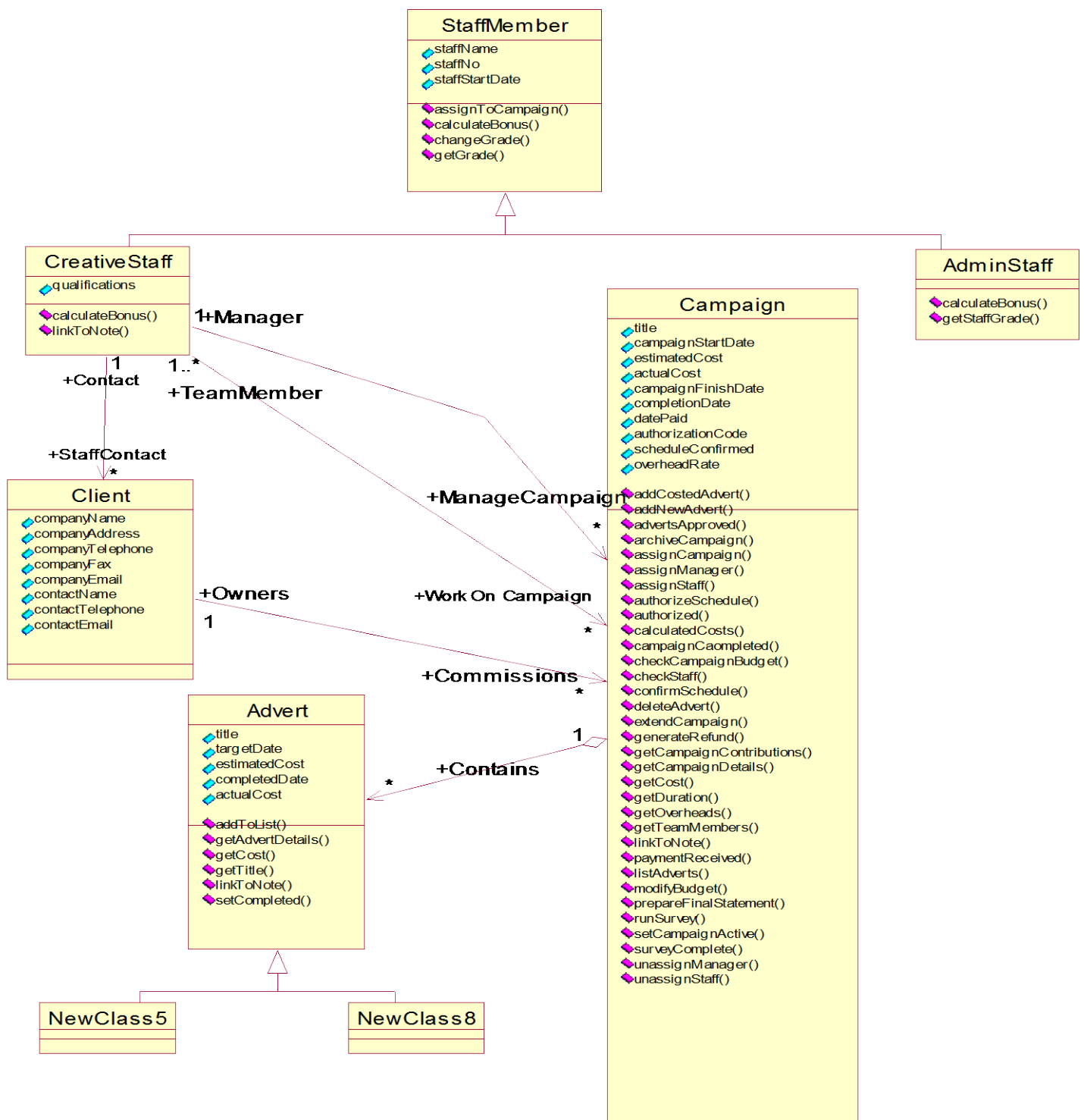


1. Select the Generalization icon from the Toolbar. As starting from the subclass drag and drop inside the superclass.
2. Right click the Association and select **Implementation inheritance**.
3. Now, re select the Generalization icon and starting from remaining subclass drag and drop in the Generalised association already created (i.e. the triangle).



NOTE: The notation for Inheritance can appear differently in some texts. However, the arrow always points to the superclass.

Now produce the Class diagram below using Rational Rose.



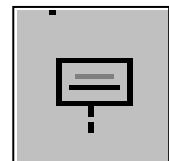
How to create Sequence Diagrams

A Sequence Diagram shows an interaction between objects arranged in a time sequence.

1. In the browser right click on **Logical View** and select **New**. Left click to select **Sequence Diagram**.
2. Give a meaningful name to the diagram, press **Enter** and then double click to select. Maximise the Sequence Diagram window if necessary.

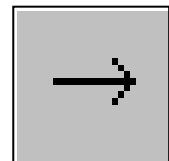
Adding Objects:

1. From the diagram toolbar, left click on **Object** icon and position pointer where the object is required on the diagram window; left click again.
2. To rename the object double click and type the new name in the **Name** box. Repeat as many times as required.



Adding Messages:

1. From the diagram toolbar, left click on **Object Message** icon.
2. Drag your mouse from one object's **lifeline** to the other object's lifeline. The message arrow is added.
3. To re-position the object message arrow, left click on it and then drag and drop it somewhere outside the object's own activation block.
4. To increase or decrease a **message activation period**, simply left click on it and then drag and drop it somewhere inside the object's own activation block.



Assigning Objects to Classes:

1. Double click on the object that you wish to assign to a class. The **Object Specification** window will appear.
2. From the **Class** drop down menu select **New**. The **Class Specification** window will appear.
3. Type an appropriate name for the class in the **Name** box and select **OK**.
4. Select **OK** again for the **Object Specification** window.

NOTE: Ensure that all objects are assigned to a class.

Adding Operations to Messages:

1. Right click on the message arrow and then click on **<new operation>**. The **Operation Specification** window appears.
2. Type an appropriate name for the operation in the **Name** box and press **OK**.

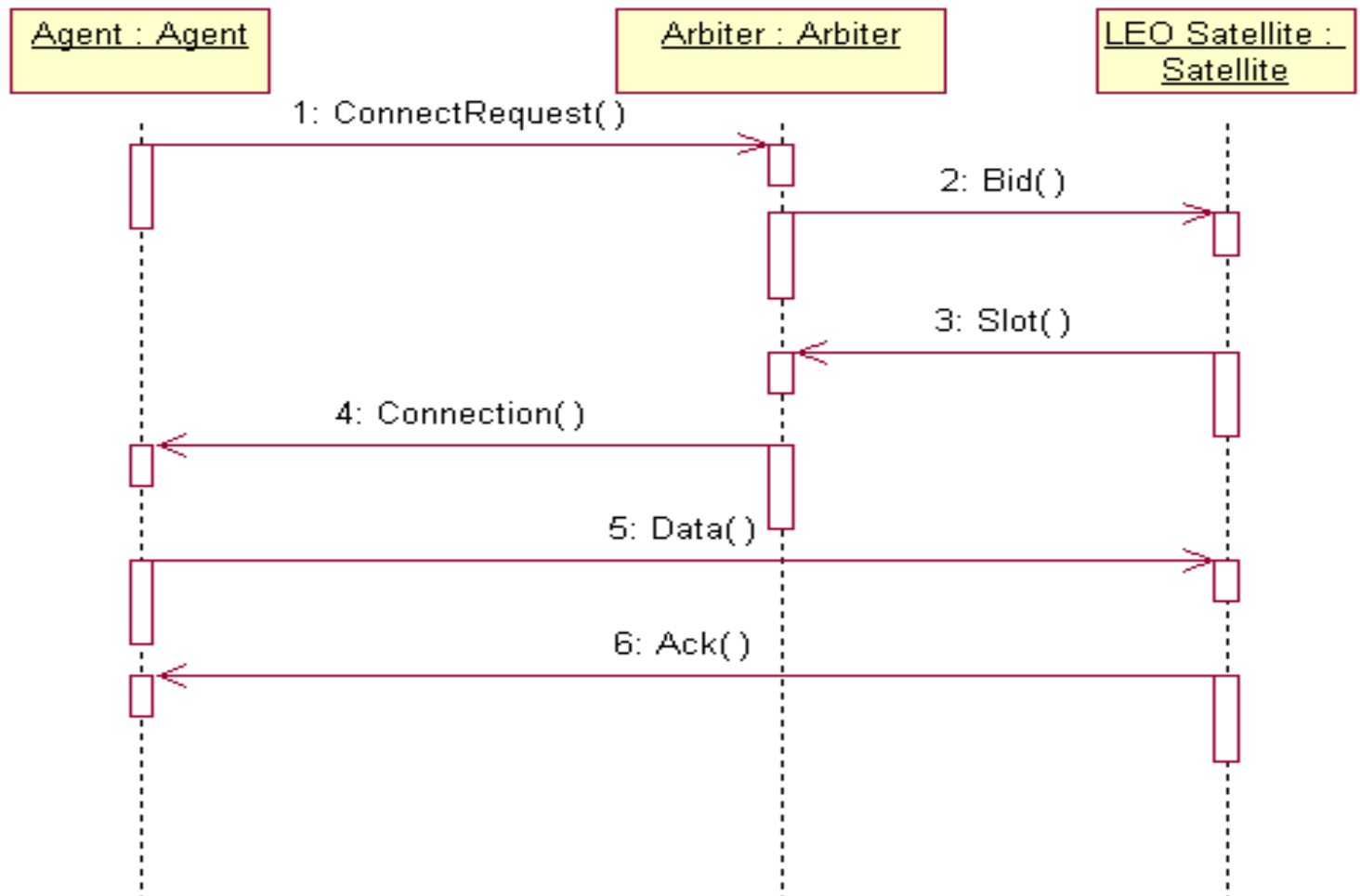
NOTE: If the message sequence numbers do not appear by default then go to **Tools, Options**, click the **Diagram** tab, tick the **sequence numbering** box.

Collaboration Diagrams

To produce a **Collaboration diagram** from the Sequence diagram that you have created simply press F5 key on the keyboard and the diagram will be produced instantly.

Task 2

Recreate the following Sequence Diagram using Rational Rose.

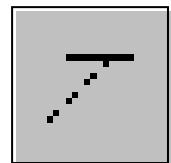


Adding an Association Class

An association class is an association that also has class properties (or a class that has association properties). Even though it is drawn as an association and a class, it is really just a single model element. Ultimately, an association class gives a home to attributes that properly belong to a link between two objects.

NOTE: It is assumed that an association link between two classes has already been established. To find out how to create an association please refer to the “**How to create a Class Diagram**” section of the manual.

1. From the diagram toolbar, left click on **Class** icon to select and position pointer where the class is required on the diagram window; left click again.
2. Again, from the diagram toolbar, left click on **Association Class** icon.
3. Starting from the class that you have just created, drag and drop the pointer to the association link.



Task 3

Recreate the following Class Diagram, which contains an Association Class using Rational Rose.

