

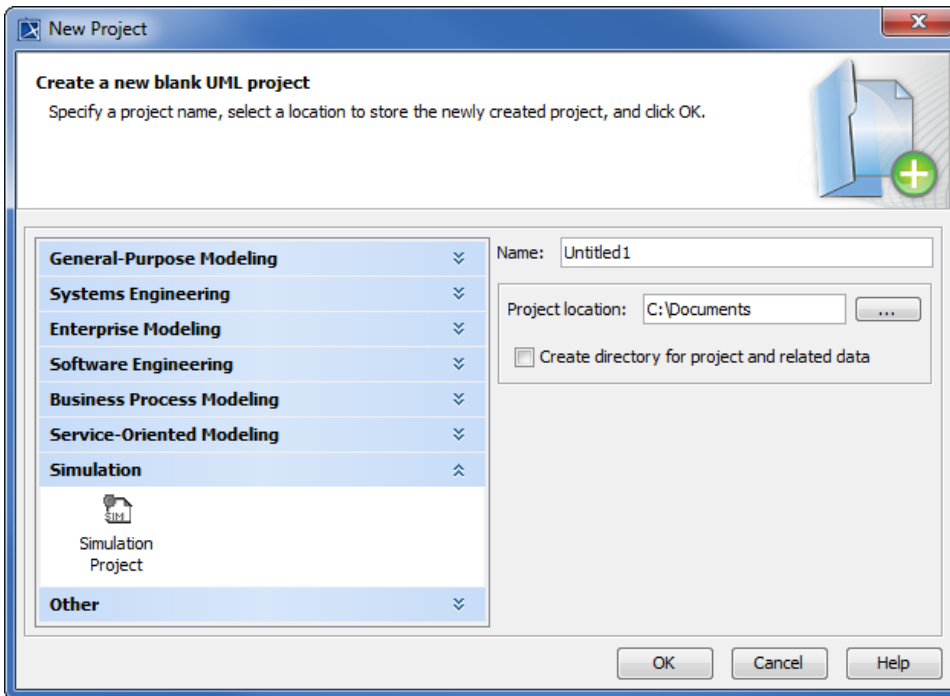
# Creating a model for Activity simulation

You can simulate a UML Activity or a Classifier whose Classifier Behavior is defined by an Activity. This section demonstrates how to create a simple but executable Activity model through the following steps

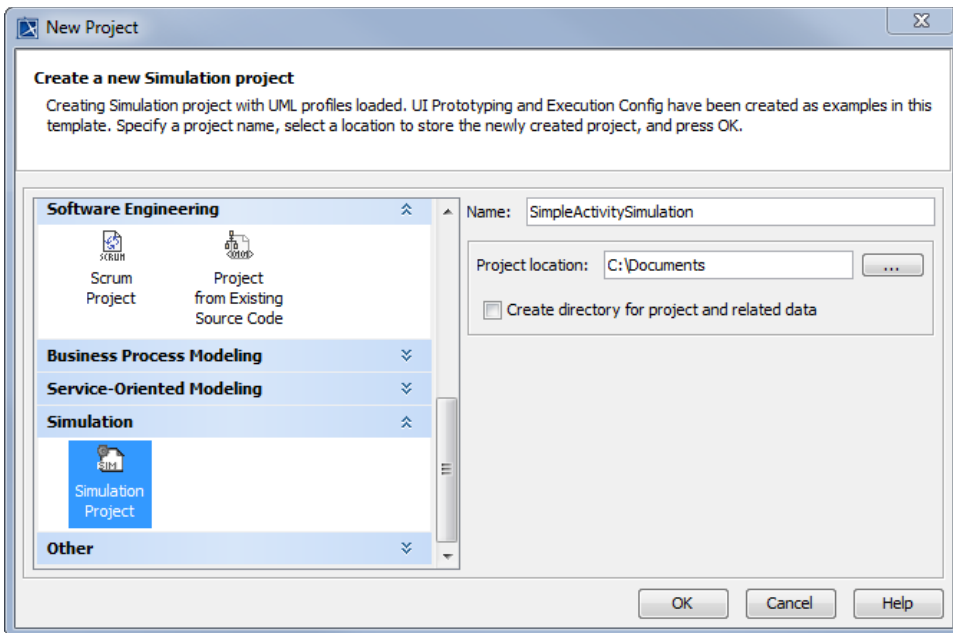
1. Create a Class containing two properties typed by Integers.
2. Create an Activity to print the summation value of the two properties.
3. Assign the Activity as the Classifier Behavior of the created Class.
4. Create an opaque Behavior to print the summation value of two input parameters of type **Integer**.
5. Write a script to print the summation of the given integer values that are referred to by the two input parameters.
6. Complete the Activity diagram of the Class.
7. Create a **ReadSelfAction** to read a runtime object that will be supplied to the input pins of both the **readX** and **readY** Actions.
8. Create an **InstanceSpecification** and assign the values to the slots that correspond to the two created properties.

To create a Class containing two attributes typed by Integers

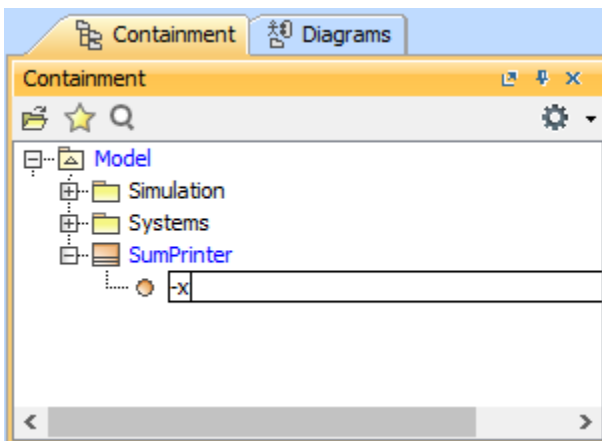
1. To create a new *UML* project, click **File > New Project** on the main menu. The **New Project** dialog will open.



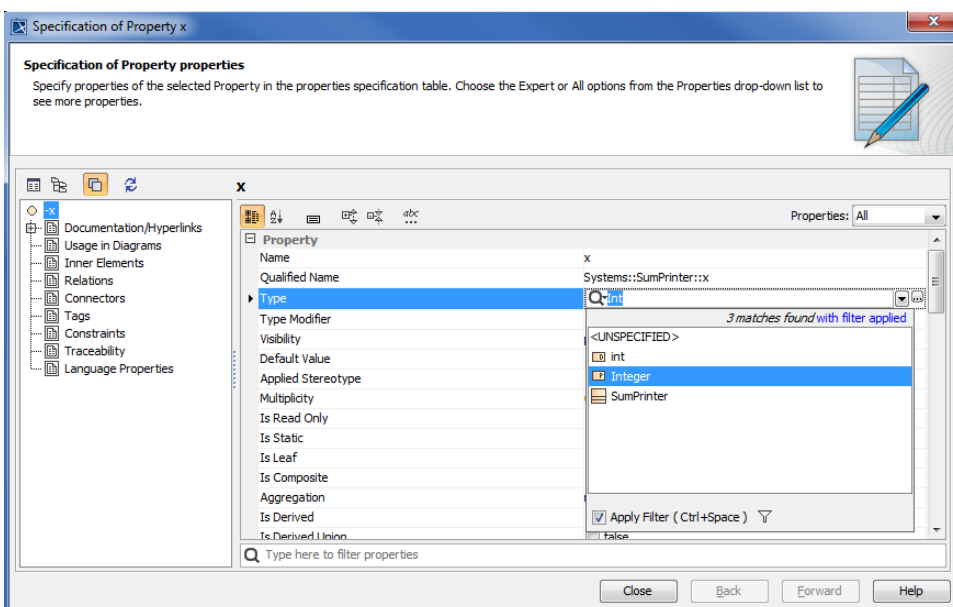
2. Select **SimulationProject** from the **Simulation** group and specify the project's name, e.g., "SimpleActivitySimulation".
3. Specify the location where you want to save your project file, and then click **OK**.
4. Right-click the **Model** model in the containment browser and select **Create Element > Class**. A new Class element, which is the context of the Activity, will be created in the containment browser. Name the created Class, e.g., "SumPrinter".
5. Add two properties: **x** and **y** of type **Integer**.  
Right-click the **SumPrinter** Class and select **Create Element > Property**. Type 'x' to name the property (see the first figure below). Right-click **x** and select **Specification** to open its Specification window. Select **Integer** as the property type (see the second figure below).



Creating a new Property x for the SumPrinter Class.

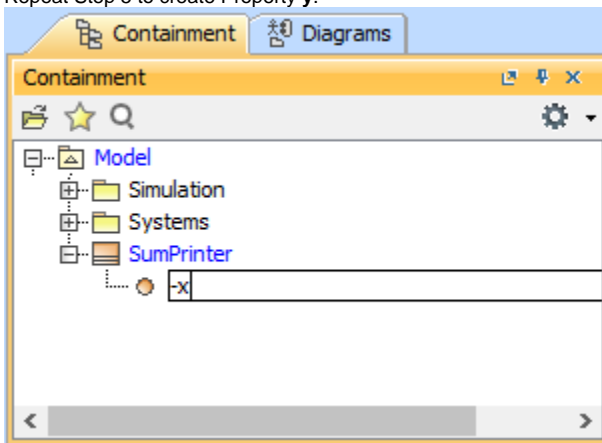


The Specification of Property x.



The SumPrinter Class with the Properties X and Y of Integer Type.

6. Repeat Step 5 to create Property **y**.



7. Once the Properties **x** and **y** have been created, define the Behavior of the created Class: Specify the Classifier Behavior of the **SumPrinter** Class with a UML Activity element.

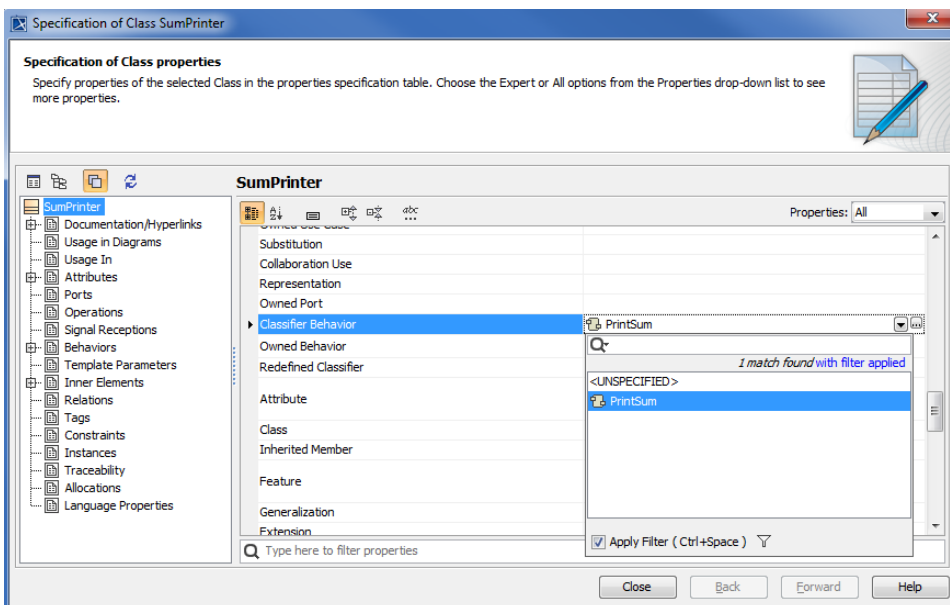
To create an Activity to print the summation value of the two properties

1. Right-click the **SumPrinter** Class in the containment browser and select **New Diagram > Activity Diagram** to create a new Activity under it.
2. Name the diagram "PrintSum".

Now that the Activity has been created, you need to assign it as the Classifier Behavior of SumPrinter.

To assign the Activity as the Classifier Behavior of the created Class

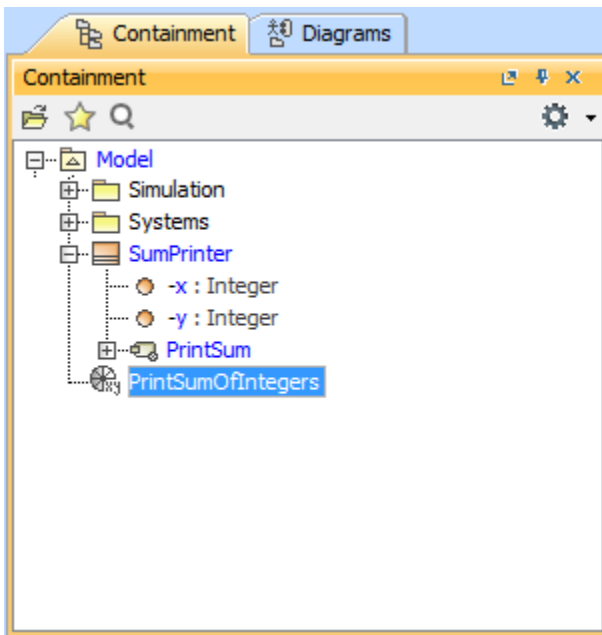
1. Right-click the **SumPrinter** Class in the containment browser and select **Specification** to open its Specification window.



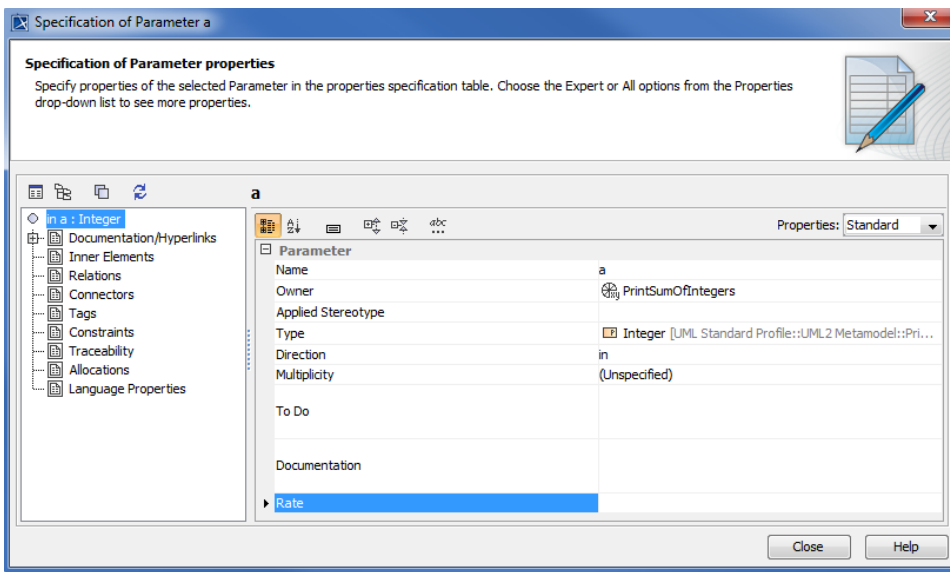
2. Select **All** from the **Properties** drop-down menu to make sure that all of the properties are listed in the dialog.
3. Click **Classifier Behavior** and select the **PrintSum** Activity from the drop-down list on the right-hand side.

To create an opaque Behavior to print the summation value of the two input parameters of type **Integer**:

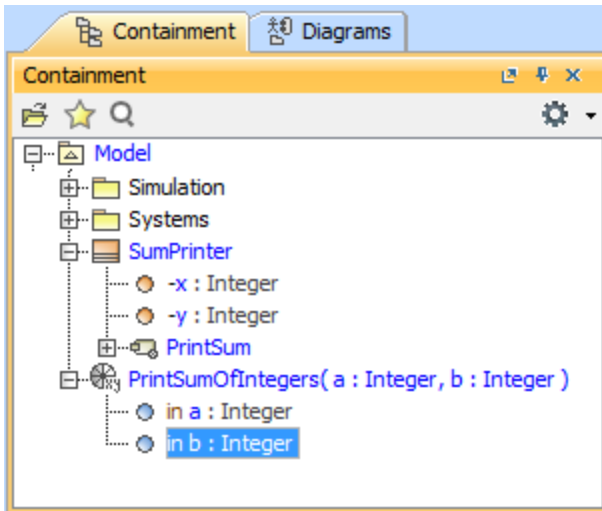
1. Right-click the **Model** model in the Containment tree and select **Create Element > Opaque Behavior**. A new opaque Behavior will be created under the **Model** model.
2. Name it "PrintSumOfIntegers". The following figure shows the PrintSumOfIntegers Opaque Behavior in the Containment browser.



3. Add two input parameters of type **Integer**: **a** and **b**.
4. Right-click the **PrintSumOfIntegers** opaque Behavior and select **Create Element > Parameter**. Name the created parameter 'a' in the name field and select **Integer** as the type of Parameter **a** (see the following figure that shows the Specification of Parameter **a**).

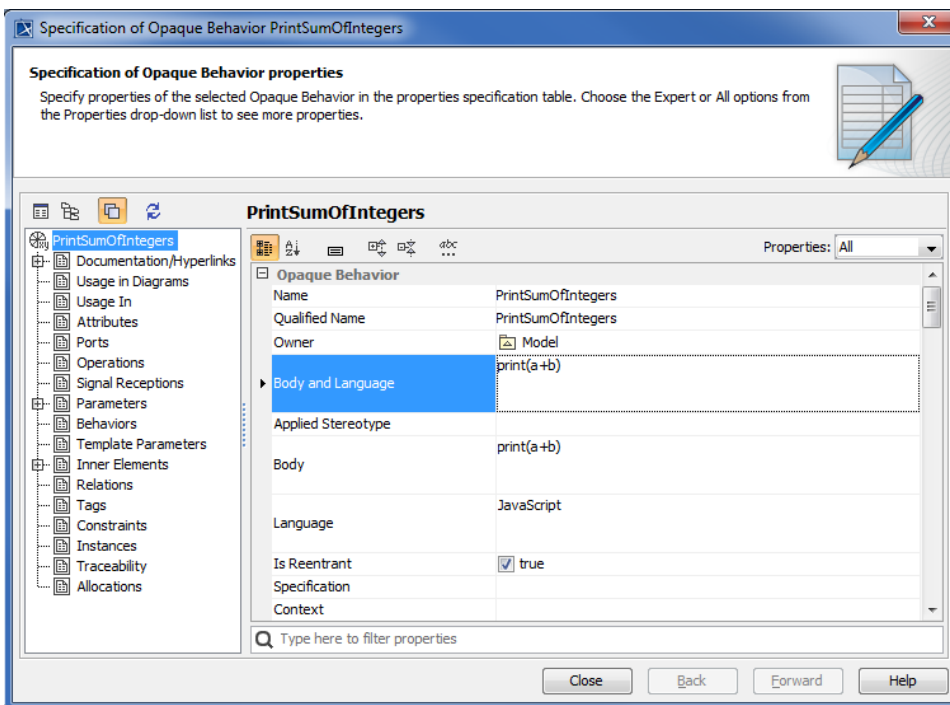


5. Repeat Steps 3-4 to create Parameter **b** as shown in the following figure that shows the PrintSumOfIntegers Opaque Behavior containing Parameters **a** and **b** in the Containment browser.



To write a script to print the summation of the given integer values

- Open the Specification window of the **PrintSumOfIntegers** opaque Behavior and write a script in the **Body** field (You can use any scripting language that is supported by MagicDraw's Macro Engine, e.g., BeanShell, Groovy, JavaScript, Python, or Ruby). In this example, JavaScript will be used to print the summation of the given integer values that are referred to by the parameters **a** and **b**; therefore, the script will be: "print(a+b)".



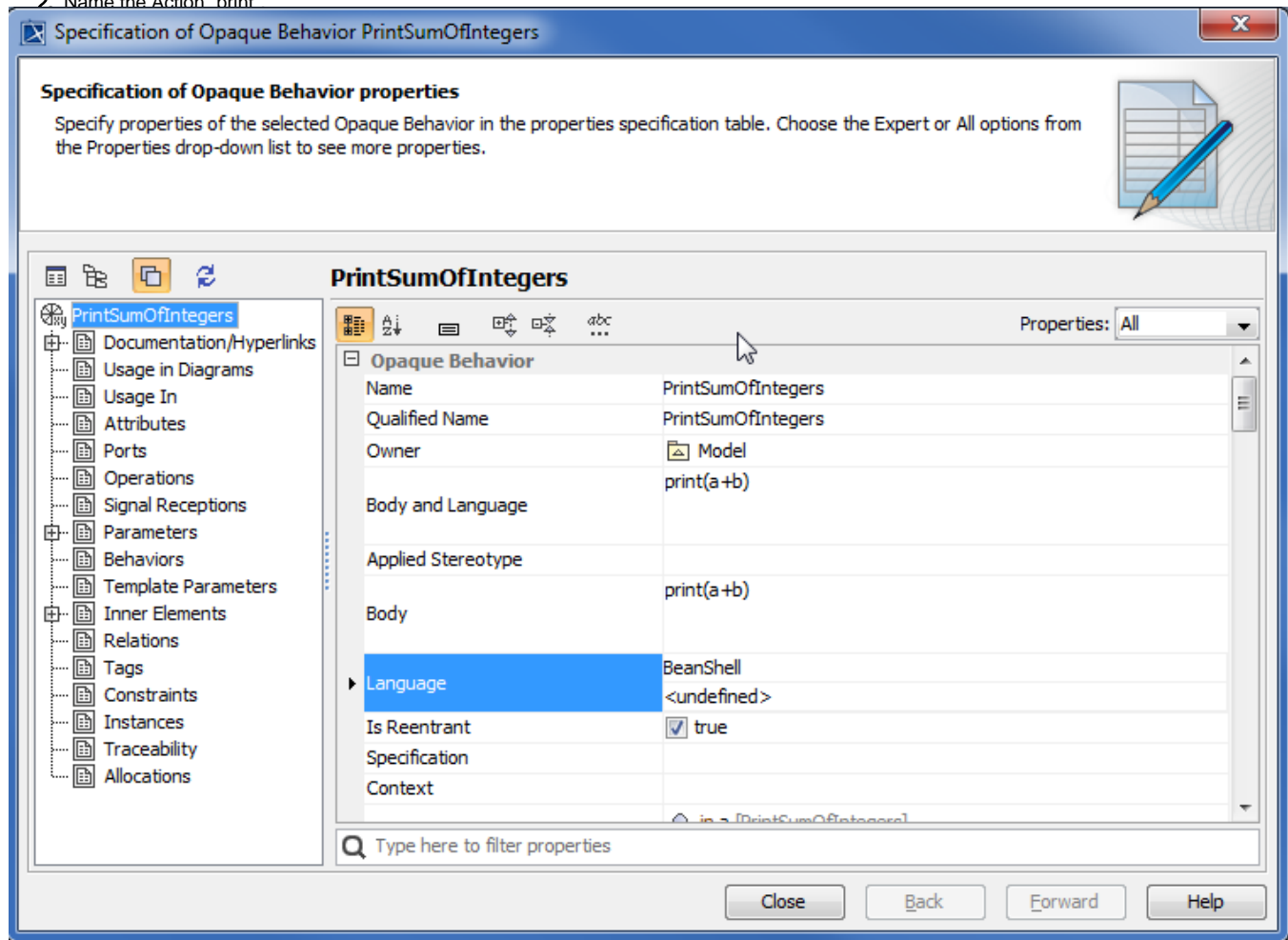
**Note**

The next step is to complete the **PrintSum** Activity diagram of the **SumPrinter** Class and add a **ReadStructuralFeatureAction** so that the values of properties **x** and **y**, which are owned by the **SumPrinter** Class, are readable. The values of **a** and **b** will later be passed on to the **PrintSumOfIntegers** opaque Behavior as the values of input parameters **a** and **b** respectively.

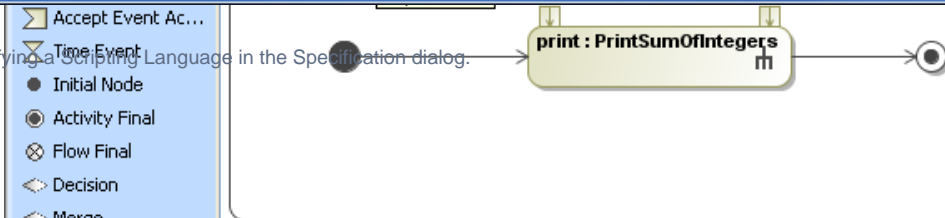
To complete the Activity diagram of the Class

1. Drag the **PrintSumOfIntegers** opaque Behavior from the containment browser to the **PrintSum** Activity diagram. A new Action of **PrintSumOfIntegers** will be created.

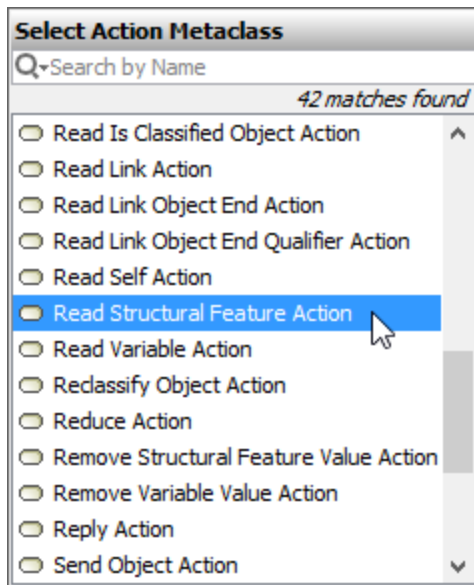
2. Name the Action "print"



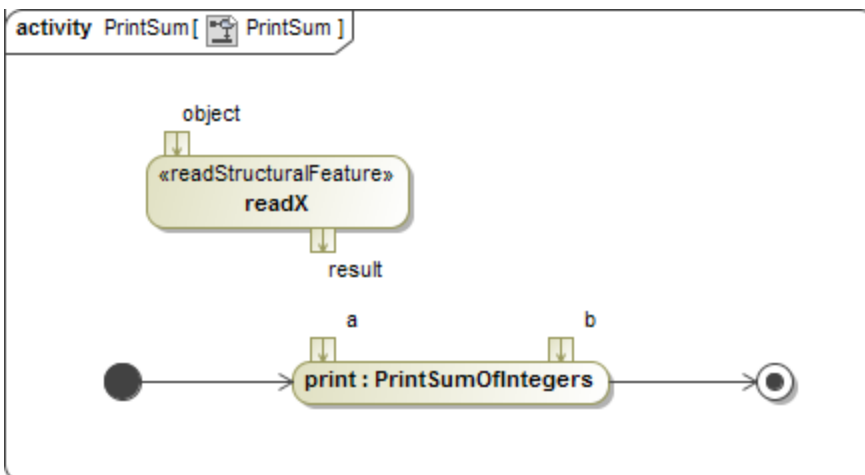
Specifying a Scripting Language in the Specification dialog.



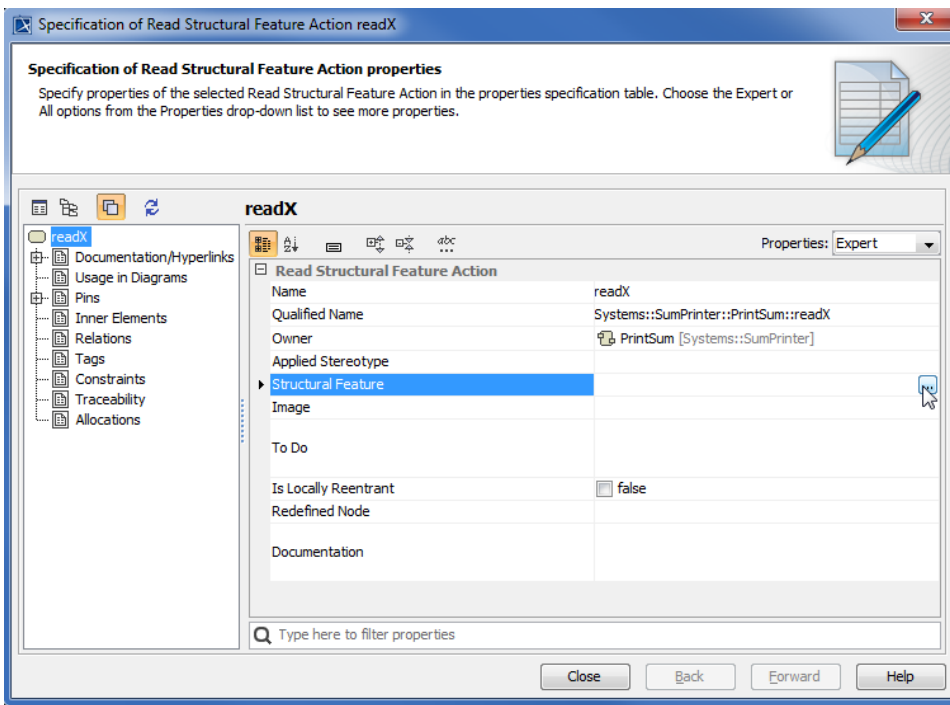
a. Select **Read Structural Feature Action** in the **Select Action MetaClass** dialog.




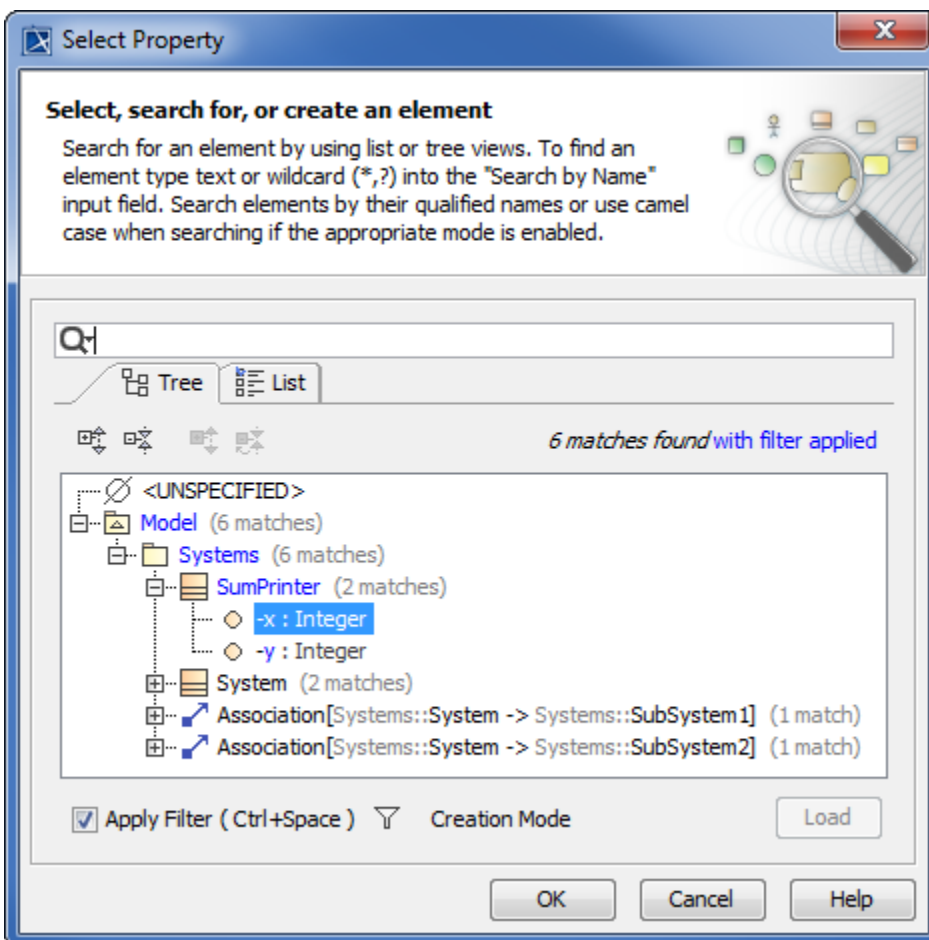
5. Click the **PrintSum** Activity diagram to create the Action and name it "readX" as shown in the following figure



6. Open the Specification window of the Action **readX**.



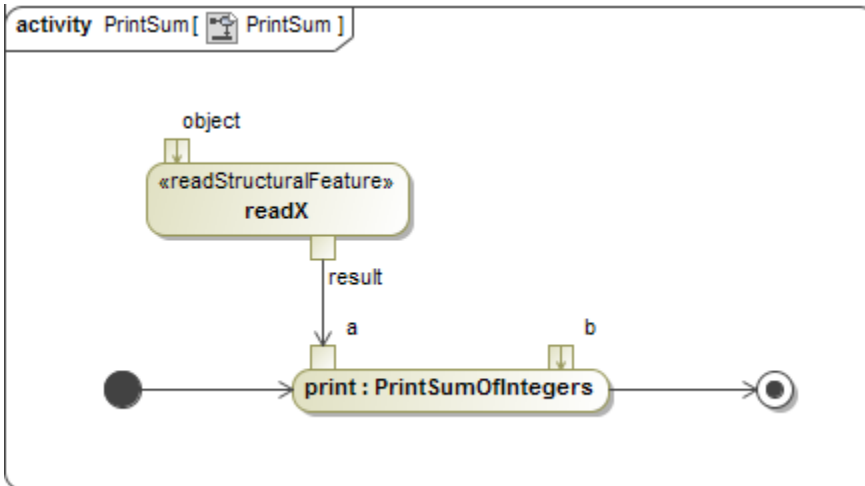
7. Click the **Structural Feature** and the  button to open the **Select Property** dialog to select **Structural Feature**.



8. Select the Property **x** of the **SumPrinter** Class and click **OK**. The **Select Property** dialog will close.



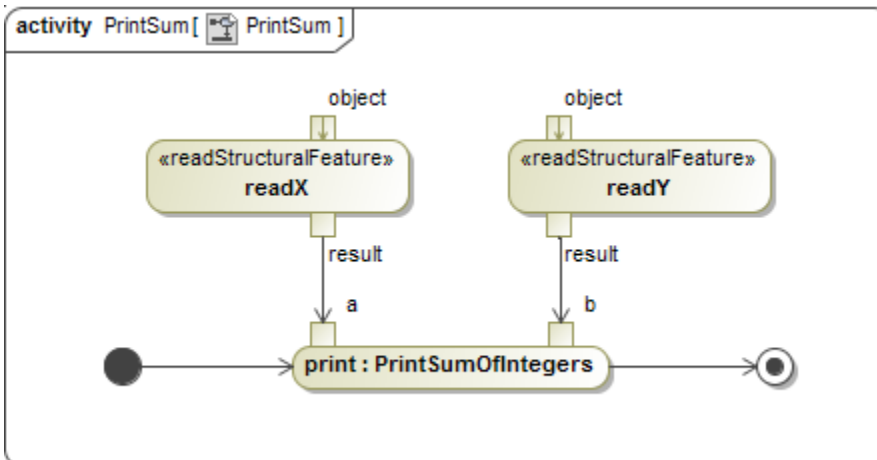
9. Create an object flow from the pin **result** of the **readX** Action to pin **a** of the **print** Action. The following figure shows the Flow between readX and print Actions in the Activity diagram.



10. Repeat Steps 4 to 10 to create another Action named **readY**, which is the **ReadStructuralFeatureAction**, with the following arrangements

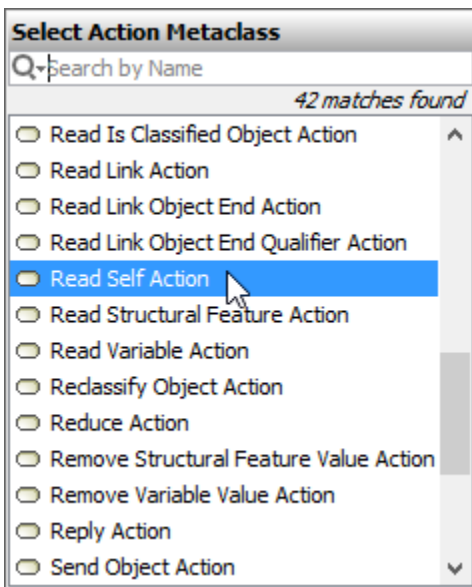
- The name of the Action is "readY".
- The structural feature is the attribute 'y' of the **SumPrinter** Class.
- The name of the output pin of **readY** is 'b'.
- The output pin **b** of **readY** connects to pin **b** of the **print** Action.

The following figure shows the Activity diagram with readX and readY Actions

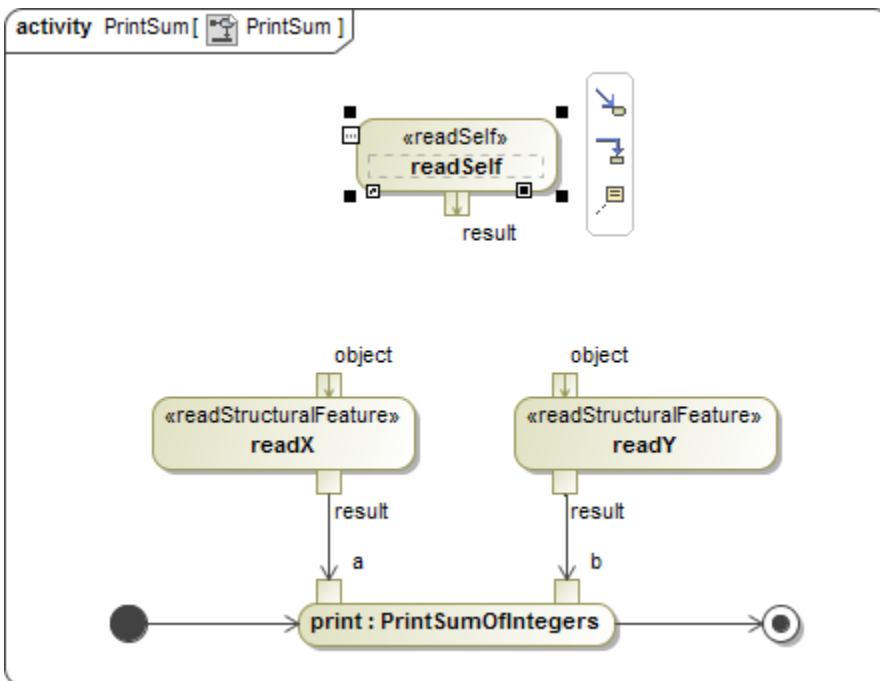


To create a ReadSelfAction to read a runtime object that will be supplied to the input pins of **readX** and **readY** Actions

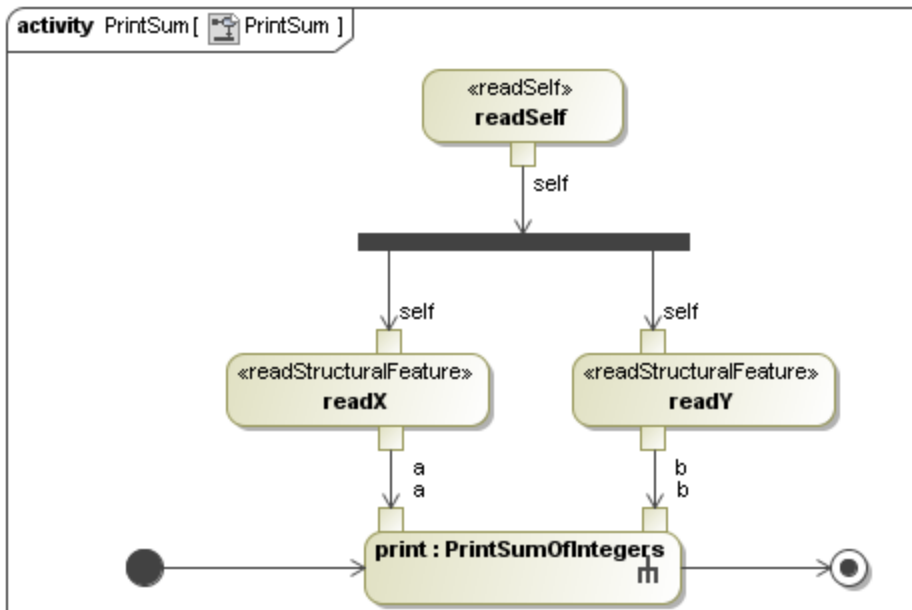
1. Click **Action > Any Action** on the Activity Diagram toolbar. The **Select Action MetaClass** dialog will open (see the following figure).



2. Select **Read Self Action**.
3. Click the **PrintSum** Activity diagram to create an Action and name it, for example, **readSelf**. The following figure shows the Activity diagram with Action readSelf.



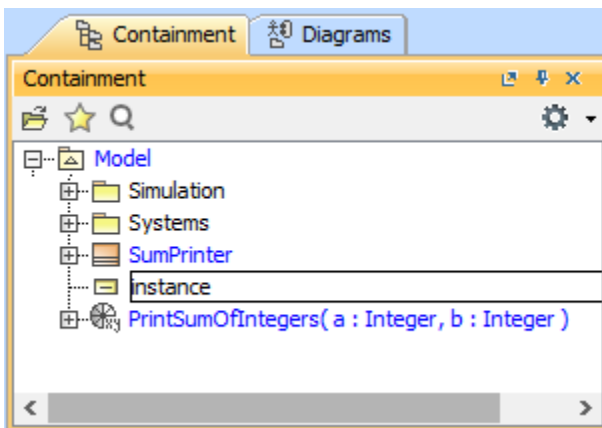
4. Create a **Fork Horizontal** and use **Object Flow** to connect it to the pins of the Actions **readX**, **readY**, and **readSelf** on the diagrams. The following figure shows a complete PrintSum Activity diagram.




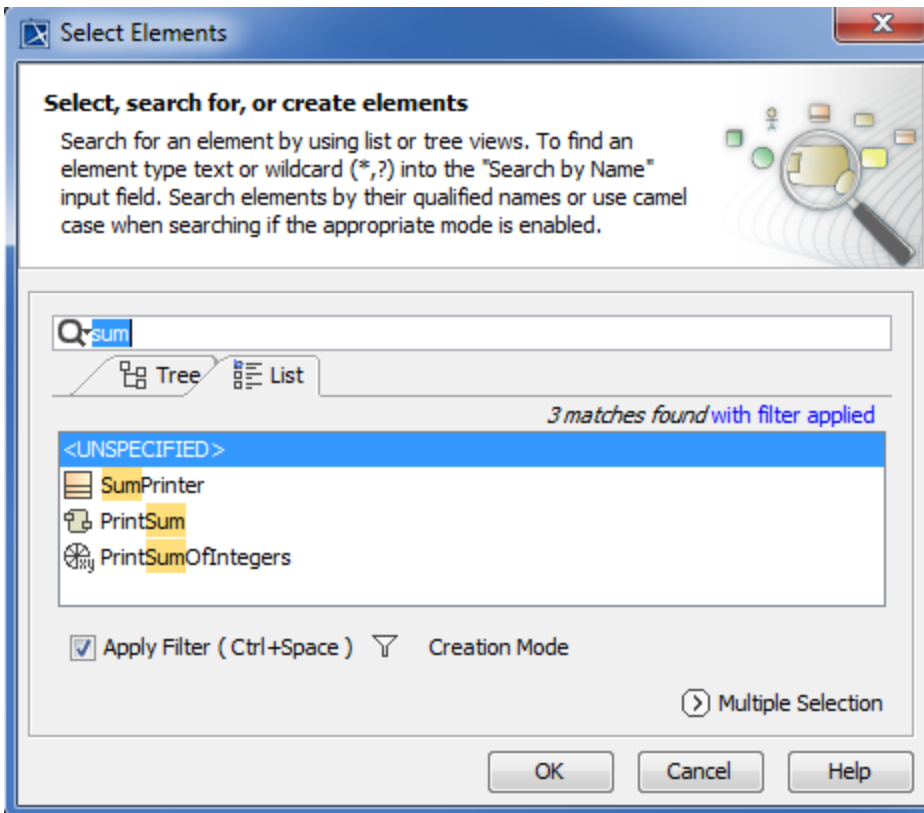
The final step is to create an **InstanceSpecification** whose Classifier is the **SumPrinter** and assign the values to the slots that correspond to the properties **x** and **y**. These values will be used during the simulation.

To create an **InstanceSpecification** whose Classifier is the **SumPrinter** and assign the values to the slots that correspond to the Properties **x** and **y**

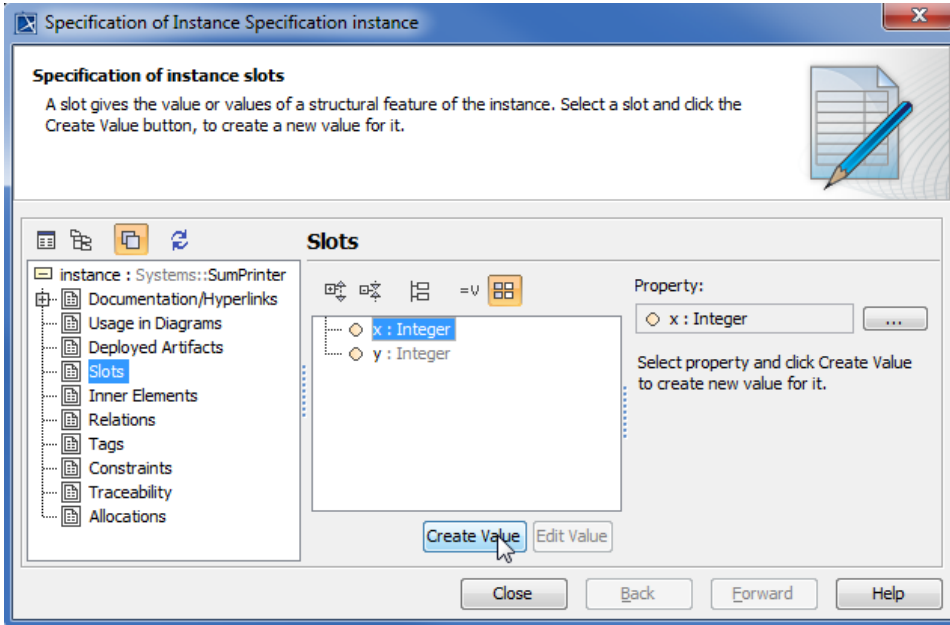
1. Right-click the **Model** model and select **Create Element > InstanceSpecification**.
2. Name the created InstanceSpecification, e.g., **instance**.



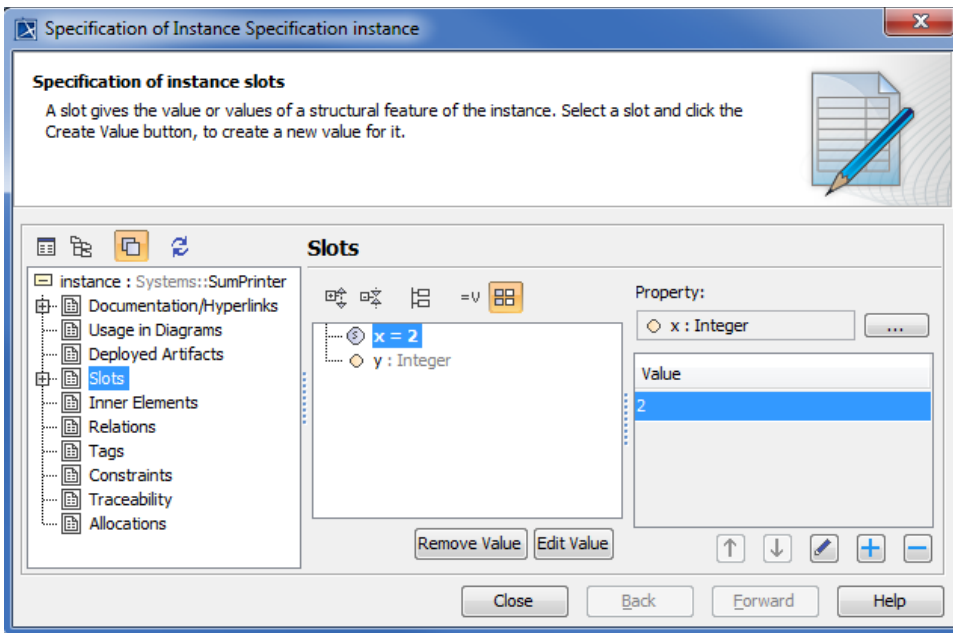
3. Right-click the created **Instance** and open the Specification window of **instance**.
4. Click the Classifier field and the  button. The **Select Elements** dialog will open.



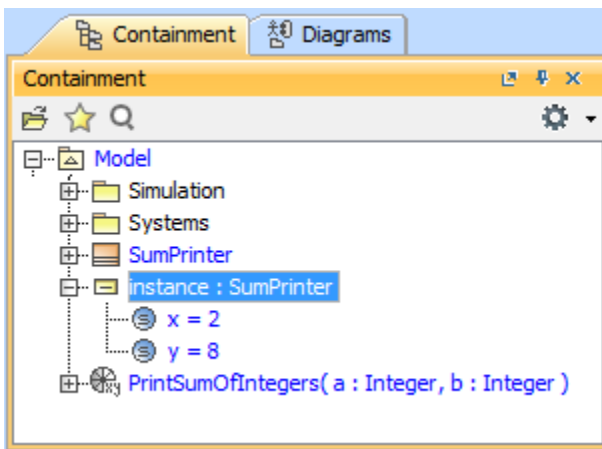
5. Select the **SumPrinter** Class to edit the Classifier and click **OK**.
6. Click **Slots** on the left-hand side pane of the Specification window and select **x:Integer**.



7. Click the **Create Value** button to create a new value of the slot. The **Value** box will open for you to assign the value to Property x slot.



- Type a number, e.g., 2 as the value of the property **x** slot.
- Repeat Steps 6 to 8 to assign "8" as the value of the property **y** slot as shown in the following figure and click **Close**.



The model is now ready for you to simulate.

#### Related pages

- [Activity](#)
- [Class](#)
- [Classifier Behavior property](#)