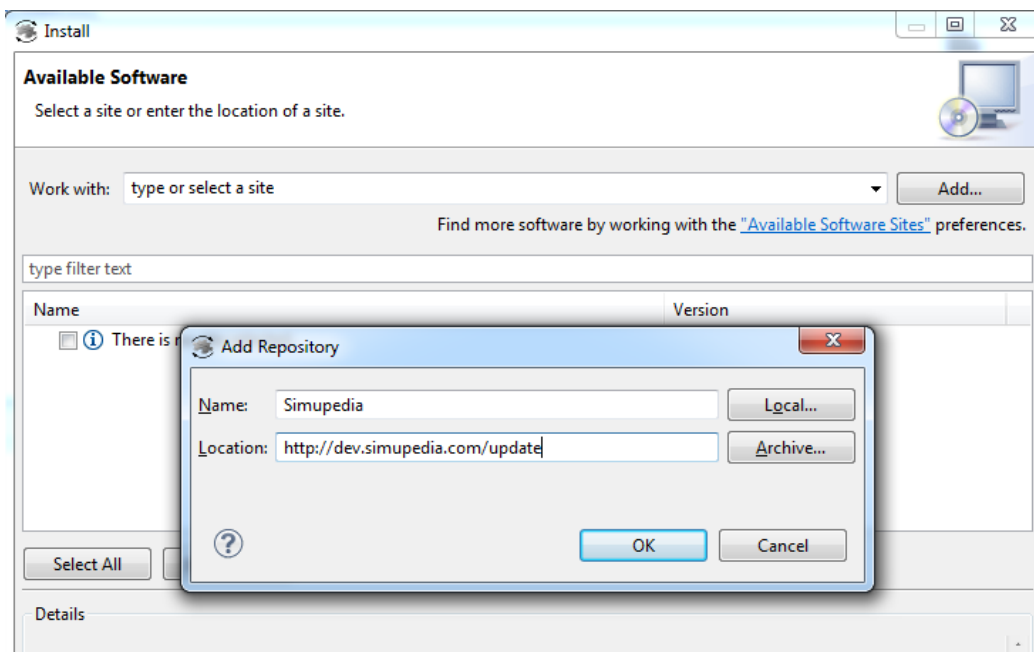


Tutorial 1 – Simupedia Basics

This tutorial will teach you how to create a simple webpage for running System Dynamics experiments using the Simupedia Studio. The end-user will be able to adjust the values of the parameters and to see the results of the simulation in a line chart.

Install the Simupedia Plug-in

First the Simupedia Studio needs to be installed from update site. Select Help -> Install New Software... to start installation. Press Add to define the Simupedia update site at <http://dev.simupedia.com/update>.



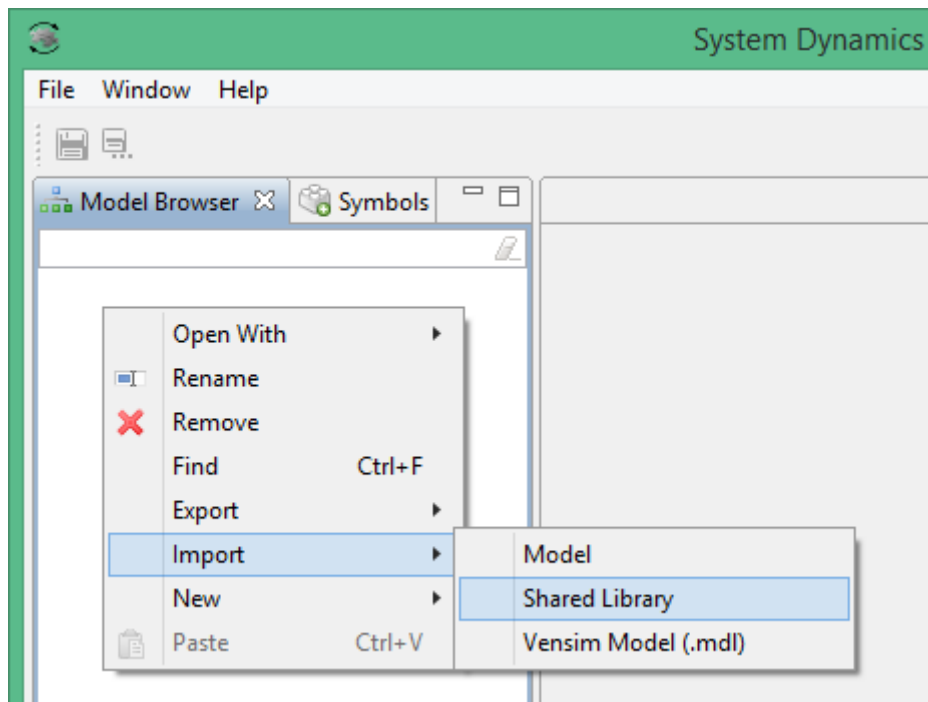
The category “THTH Member Components” appears. Select “Simupedia Workbench” and press Next. After the installation process please restart the software as requested.

Import the Simupedia Shared Library

We will be using widgets from the Simupedia shared library in this tutorial, so first we import the Simupedia shared library to the workspace. File SysdynSimupedia.sharedLibrary should be downloaded from the location of this manual.

1. Right-click on the Model Browser and select Import -> Shared Library.
2. Locate the downloaded SysdynSimupedia.sharedLibrary and click Open.

Alternatively you can import the shared library by selecting File -> Import Shared Library from the Main menu.

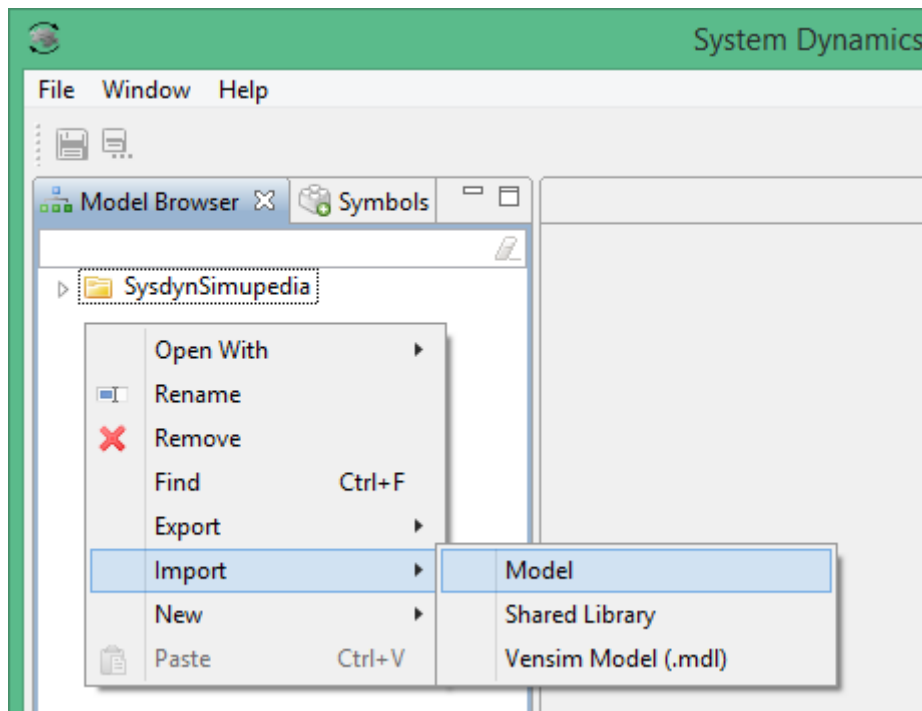


Import the Sample Model

This tutorial will use Predator and Limited Prey as a sample model. Next we import it to the workspace.

1. Right-click on the Model Browser and select Import -> Model.
2. Find "sampleModels\Predator And Limited Prey.sysdyn" in your SysDyn installation folder and click Open.

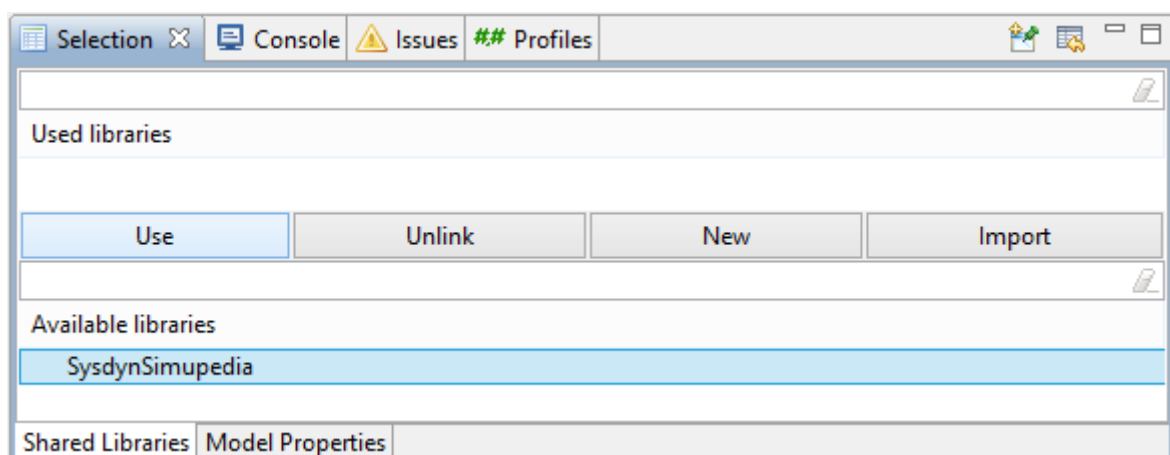
Alternatively you can import the sample model by selecting File -> Import Model from the Main menu.



Activate the Simupedia Shared Library

Next we activate the Simupedia Shared Library for the sample model.

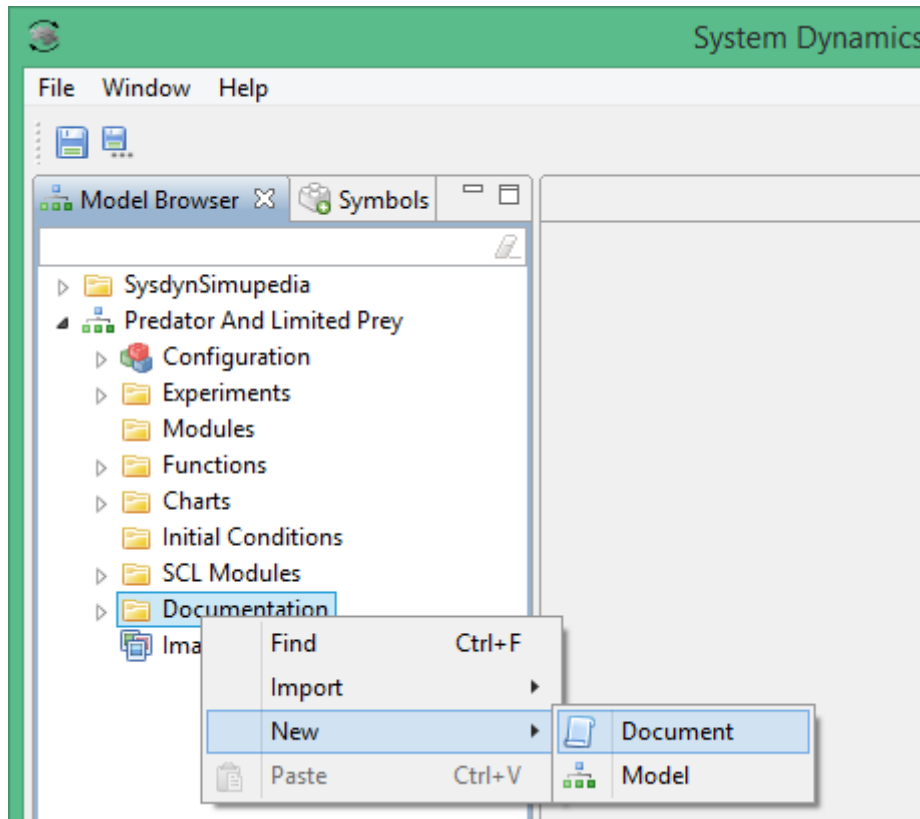
1. Select the Predator And Limited Prey model at the Model Browser.
2. Open the Selection tab.
3. Select SysdynSimupedia from the list of Available libraries and click Use to activate it.



Create a New Document

Next we create a new document. Document represents a single web page.

1. Expand the Predator And Limited Prey Model at the Model Browser.
2. Right-click on Documentation and select New -> Document. The new document will appear as "Document" under the Documentation tree.

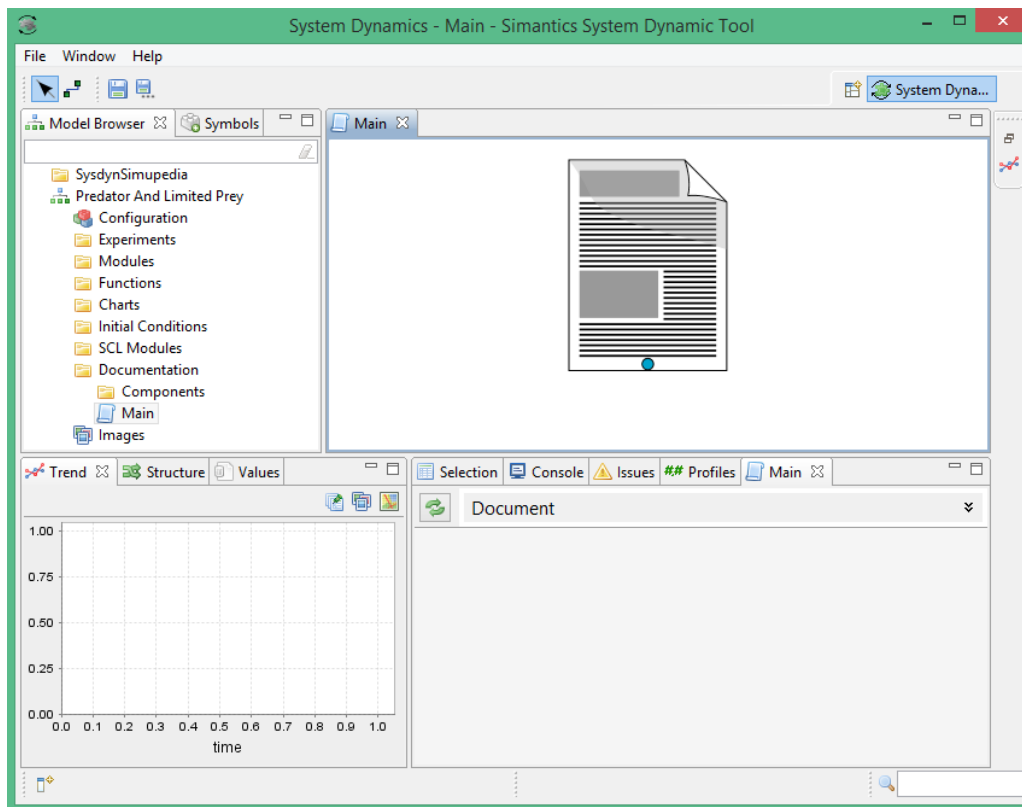


3. Right click on Document and Select Rename. Then rename the document to "Main".

Editing the Document

Next we open the Document Editor and the Document Viewer. Document Editor will show us the structure of the webpage as a graph consisting of various interconnected widgets. Document Viewer will show us the preview of the actual webpage.

1. Double-click the Main document to open it in a new Document Editor. You will see the Root element under which we start building the document.
2. Open Document Viewer at Window -> Show View -> Other... -> Documentation -> Document Viewer. At this point you will see only an empty webpage.



Containers

First we add a Vertical Panel to hold the contents of the webpage. Vertical Panel is a Container that lays out its child elements vertically on the webpage in the same order as the corresponding terminals.

1. Open the Symbols view and expand Containers.
2. Drag Vertical Panel to the Editor View next to the Document's Root element.

Then we connect the Vertical Panel to the Root element.

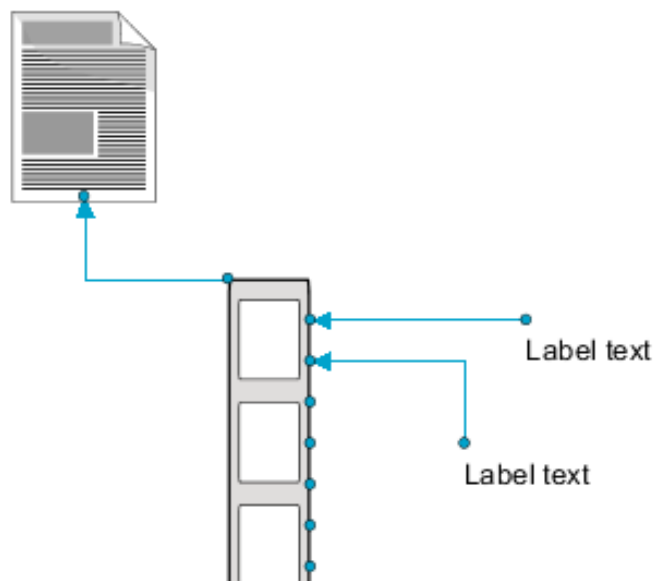
1. Hold down Alt.
2. Click the terminal in the upper left corner of the Vertical Panel.
3. Click the terminal in the Root element.
4. Release Alt.



Header

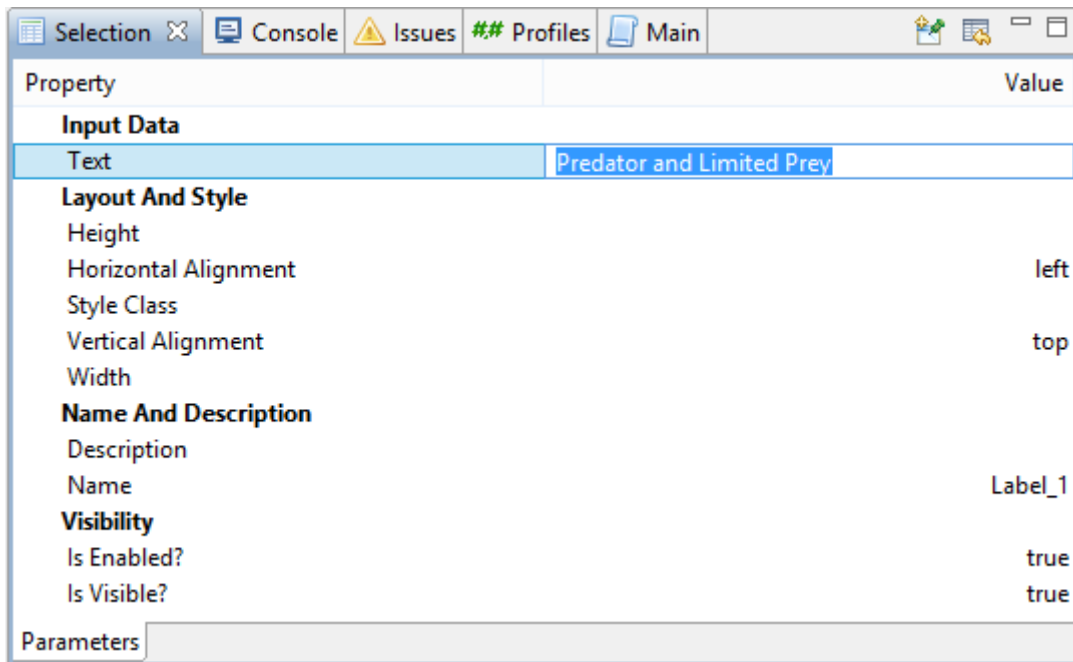
Next we add a title and some text on top of the page.

1. Open the Symbols View and expand Primitive Widgets.
2. Drag two Label widgets next to the Vertical Panel.
3. Connect the Label widgets to the topmost terminals on the right side of the Vertical Panel.

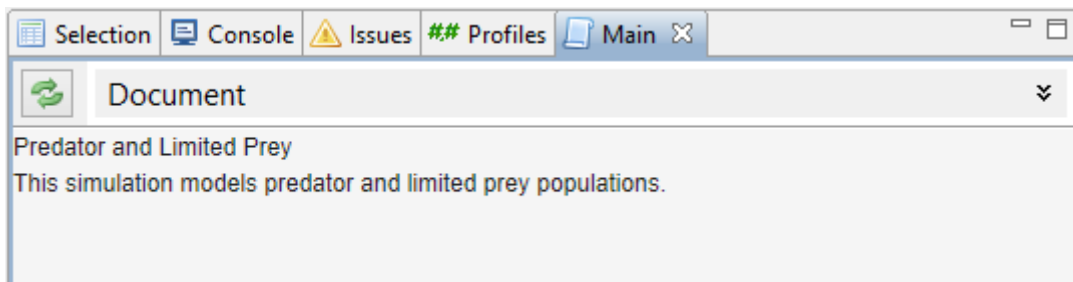


Then we edit the contents of the Labels.

1. Click the first Label widget and open the Selection tab to edit the properties of the Label.
2. Enter “Predator and Limited Prey” to the Text property (without quotation marks).
3. Likewise enter some additional text to the second Label widget. For example “This simulation models predator and limited prey populations.”



Now you can preview your first changes by opening the Document Viewer (Main). The document will look very harsh because we didn't do any style formatting. You can later add styling by entering Style Classes for the widgets and by defining the corresponding CSS style sheet at the Document -> Selection -> CSS tab.

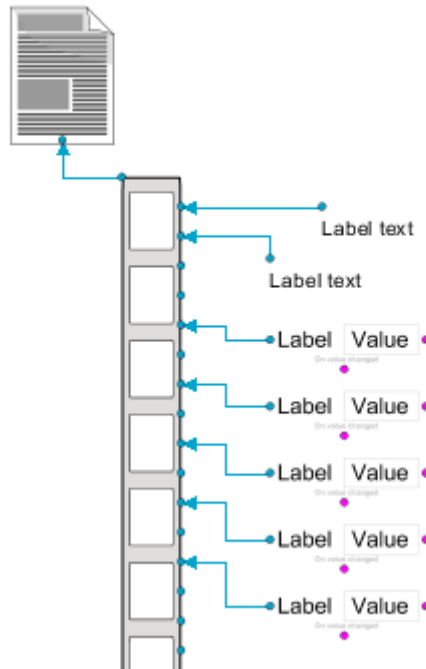


Input Fields

Next we add input fields for each parameter. We will be using the LabelAndValue widget which consists of a label and a text field. Each instance of the LabelAndValue widget will be bound to certain parameter whose value it can then be used to display and update.

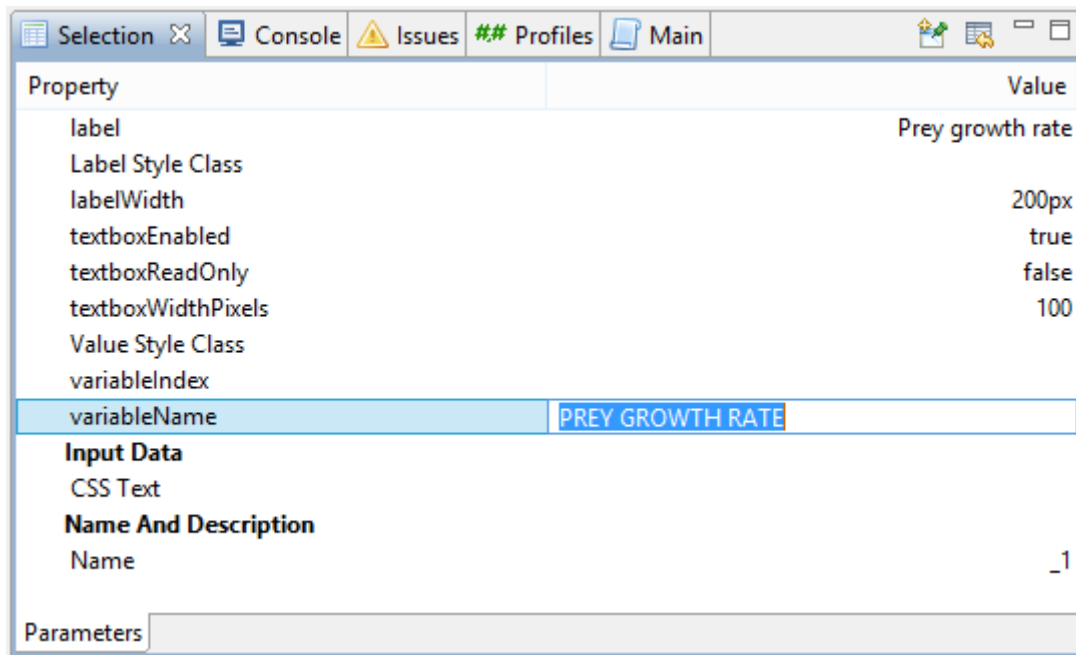
1. Drag five instances of the LabelAndValue widget to the Document Editor next to the Vertical Panel. You can find the widget from Symbols -> Sysdyn Simupedia.
2. Connect the LabelAndValue widgets from their left (blue) terminals to the Vertical Panel.

We leave the pink terminals unconnected at this point. Later they will be used to trigger parameter updates and simulation runs.



Next we bind the input fields to corresponding parameters and enter labels and label widths.

1. Select the topmost LabelAndValue widget in the Document Editor and open the Selection View to edit the properties of the widget.
2. Enter "PREY GROWTH RATE" as the variableName (without quotation marks). This binds the LabelAndValue widget to the matching model parameter.
3. Enter "Prey growth rate" as the label (without quotation marks). This label will be shown on the webpage.
4. Adjust the labelWidth to 200px to reserve enough space for the label.



Similarly enter variableName, label and labelWidth for the remaining LabelAndValue widgets according to the following table.

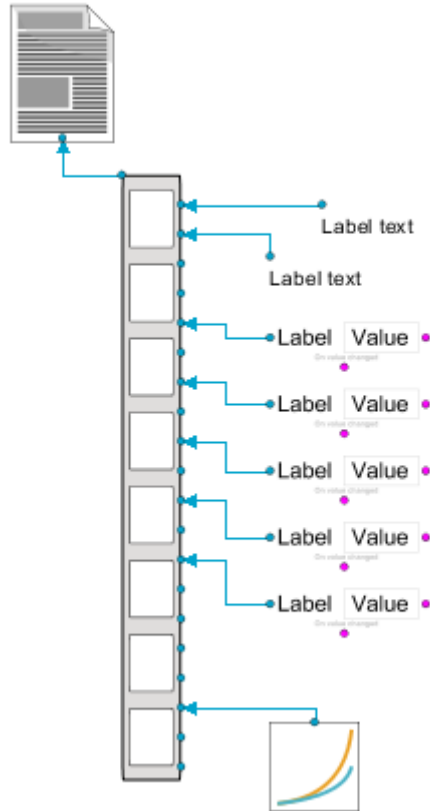
	<i>variableName</i>	<i>label</i>	<i>labelWidth</i>
1	PREY GROWTH RATE	Prey growth rate	200px
2	CARRYING CAPASITY FOR PREY ¹	Carrying capacity for prey	200px
3	PREY LOSS RATE	Prey loss rate	200px
4	PREDATOR GAIN RATE	Predator gain rate	200px
5	ENERGY CONSUMPTION RATE	Energy consumption rate	200px

1) CAPASITY is misspelled as CAPASITY in the original sample model, so we misspell it on purpose.

Line Chart

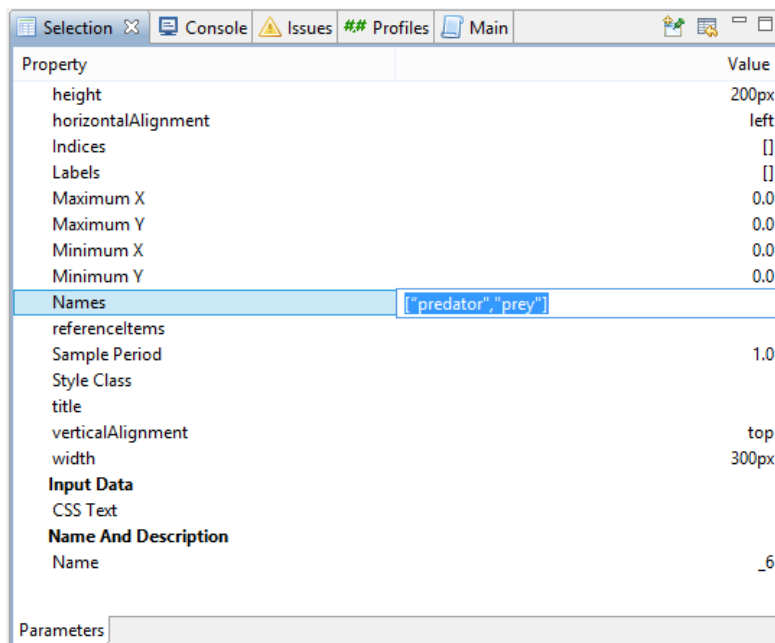
Next we add a line chart to visualize the simulation results. We will be using the LineChart widget which automates the displaying of the results.

1. Drag a LineChart widget to the Document Editor next to the Vertical Panel. You can find the widget from Symbols -> Sysdyn Simupedia.
2. Connect the LineChart widget to the Vertical Panel.



Next we configure the LineChart widget to display time series of the “predator” and “prey” stock variables.

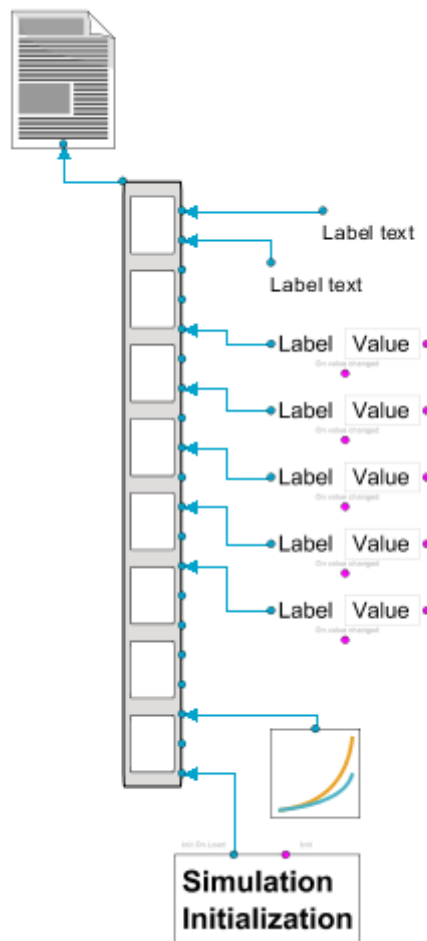
1. Enter ["predator","prey"] to Names property. The names must match with the names of the model variables.
2. Enter 10.0 to Maximum X to limit the maximum value shown on the X axis (time).
3. Enter 0.1 to Sample period. This defines the resolution for the chart.



Simulation Initialization

Next we add a simulation initializer to the document. Simulation initialization can be done automatically when the webpage is loaded or it can be triggered manually. In this example we will be using the automatic initialization.

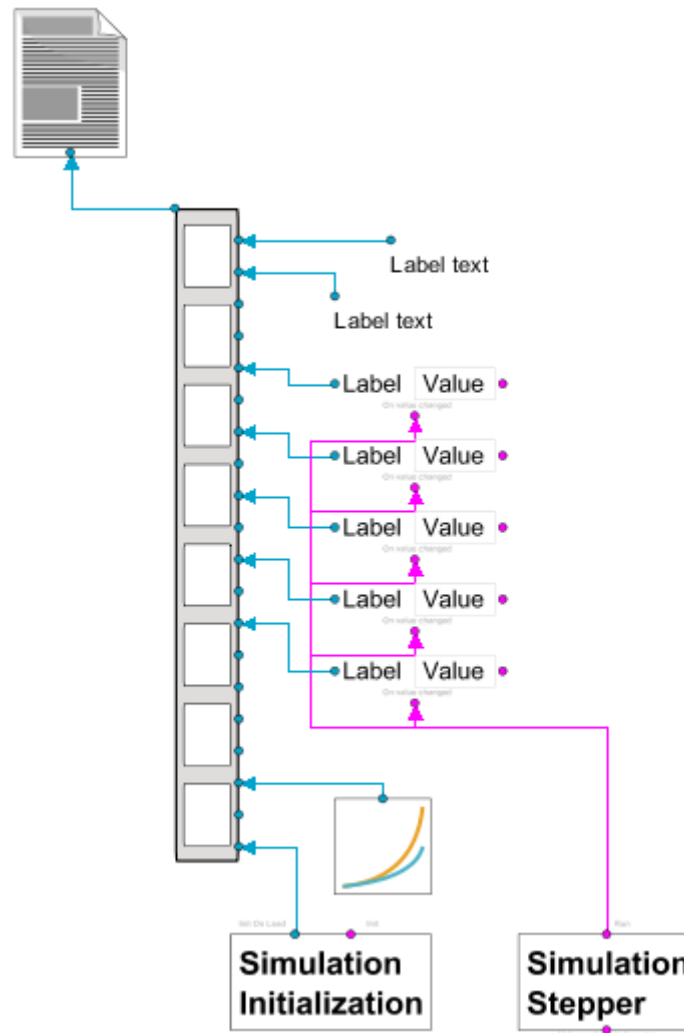
1. Drag a SimulationInitialization widget to the Document Editor next to the Vertical Panel. You can find the widget from Symbols -> Sysdyn Simupedia
2. Connect the SimulationInitialization widget from its blue terminal to the Vertical Panel. This indicates that the simulation will be initialized automatically.



Simulation Stepper

Next we add a simulation stepper and configure it to run the simulation whenever the user has changed the values of the parameters.

1. Drag a SimulationStepper widget to the Document Editor next to the SimulationInitialization widget. You can find the widget from Symbols -> Sysdyn Simupedia
2. Connect the SimulationStepper widget from its top (Run) terminal to the LabelAndValue widgets' bottom (On value changed) terminals. This indicates that the simulation will be run automatically on each value change.

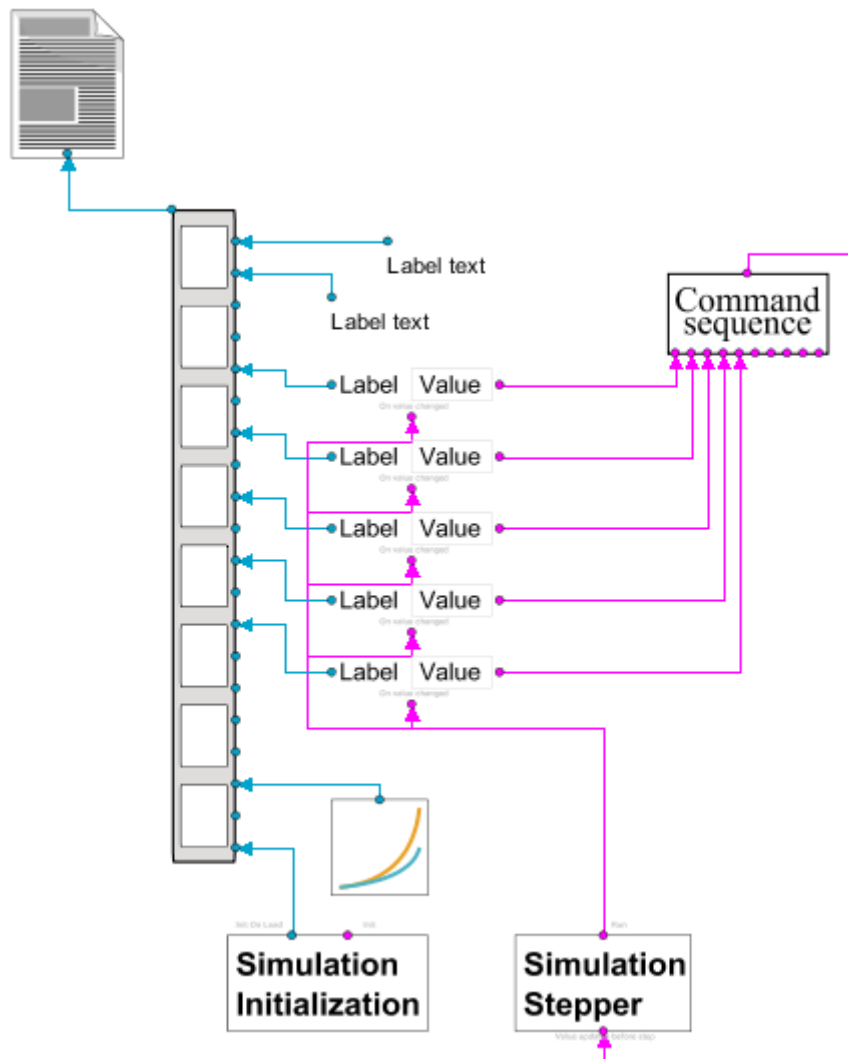


We still have to trigger the LabelAndValue widgets to update the simulation parameters before the simulation is run. This can be achieved by connecting the SimulationStepper widget from its “Value updates before step” terminal to the pink terminals on the right side of each LabelAndValue widget. We can, however, trigger only single event from one connection point, so we have to use a command sequence to trigger multiple value updates.

Command sequences

Finally we add a Command sequence between the SimulationStepper and the LabelAndValue widgets. Command sequence is triggered from its topmost terminal and it triggers its child events one-by-one starting from the leftmost terminal in the bottom.

1. Drag a Command Sequence widget from *Symbols -> Events and data* to Document Editor next to the SimulationStepper widget.
2. Connect the Command Sequence widget from its topmost terminal to the “Value updates before step” terminal in the SimulationStepper widget.
3. Connect the command Sequence widget from its bottom terminals to the pink terminals on the right side of the LabelAndValue widgets.



Run the Simulation

You have now finished your first document. It's time to see how it works.

1. Open the Main document in the Document Viewer.
(Show Document Viewer: Window -> Show View -> Other... -> Documentation -> Document Viewer)
2. Enter values for the parameters.
3. See the results of the simulation in the line chart.

