CellML Editor Tutorial: Creating a new Model (Text Mode)

Overview

In this tutorial, you will be introduced to many of the basic functionalities of the editor.

Assumed Knowledge

- Experience with CellML 1.0/2.0
- Read through the CellML Editor Documentation

Steps

1. Launching the Editor

The editor can be launched by running the corresponding executable file for your operating system:

- Windows: “CellML Editor.exe”
- MacOS: “CellML Editor”
- Linux: “CellML Editor”

After launching the editor, you will be in the default state of the editor.

2. Creating a New File

Create a new CellML file using the ‘Empty File’ option (File → New File).

3. Creating the `model` Element using Autocompletion

Trigger the autosuggestion prompt by using one of the below methods:

- Start typing the word `model`
- Type in the start angle bracket (<)
- Pressing Ctrl/Cmd + Space

Then, select the `model` suggestion by using the arrow keys and enter to select.

4. Viewing and Fixing Errors

In the Problem Pane on the bottom section of the editor, there will be a warning indicating that the ‘model’ element is missing a valid ‘name’ attribute. To fix this warning:

- Give the `model` a name

5. Creating the `component` Element Using Element View

The Element View provides information and actions for the element that is currently under the cursor. To create the component using Element View:

- Move the text cursor to be directly under the `model` tag to set the context
- Find the ‘component’ item under the ‘Add Child Element’ section
- Click the plus button to insert the element into the file.

6. Editing Attributes using Attribute View

The Attribute View can be used to edit attributes. The advantage of using this instead of editing in text is that it shows all the required and optional attributes of an element (regardless of it having a value or not). Using the Attribute View:

- Set the `name` attribute to `myComponent1`
- Set the `component_ref` attribute to `myComponent2

7. Exporting Components

To export the component `myComponent1` from step 6 to the local library:

- Right click on the start tag of `myComponent1` to bring up the context menu
- Select `Export Component`
- Give the component a name identifier

8. Importing Components

To import the component from the library:

- Place the cursor at the location to import the component
- Find the exported component from the previous step
- Click on the component to see a preview of the content
- Click the plus button to insert the component into the file

9. Generate the model image

To create the model based on cellml:

- Find the ‘Render Model’ Button
- Place the cursor in the model section (bottom right)
- Click on this button to generate the model onto the canvas

CellML Editor Tutorial: Creating a new Model (Visual Mode)

1.. Open the model creator tab

If you want to create a new model visually:

- Find the ‘File’ section of the tool bar (top left of the application)
- Move mouse/cursor to the button and click it
- Select the ‘Open Graphical Editor’
- New screen will appear in the centre

2. Adding an element to the model

By dragging the element and dropping the element onto the canvas you generate and display the into the model

- Find the ‘Component’ section at the bottom
- Click the Component element on the bottom section to select the element
- Make sure the right side of the canvas (information and input section) is scrolled long enough to be seen
- Hover over the name input box to see the valid names possible
- Give a component a valid name (green border) by typing in the input box “house_of_capulet”
- Click and hold the element image to grab it
- Move cursor onto the canvas to drop in a location you desire
- Add another component called “house_of_montague”

4. Adding a child element to the model

Since elements may have children, you want to be able to connect them and so

- Find the variable section in the bottom
- Fill in the criteria:
    - Reference: “1”
    - Name: “juliet”
    - Units: “dimensionless”
    - Interface: “public”
    - Initial_value: “”
- Drag and drop the unit onto the canvas
- Add another variable:
    - Reference: “2”
    - Name: “Romeo”
    - Units: “dimensionless”
    - Interface: “public”
    - Initial_value: “”

5. Editing an existing element

Clicking on an element should show its details and will allow the user to interact with it, if the user picks up on a mistake and wishes to change they can change the interior and update the element

- Select the ‘juliet’ element by clicking (sometimes requires double click)
- Hold onto the element
- Move cursor around the canvas while holding for the element to move
- Release once in a happy spot
- Select the name input and change it to “Juliet” (with a capital)
- Click on the ‘update’ button
    - Note: If the element does not update try clicking the element a second time
- Notice the information has updated

6. Adding another element

We want to show a connection between two elements, to do so we use ‘connection’ for component linking and ‘map_variables’ for variable linking.

- Click on the connection element in the bottom
- Click on the ‘example’ section to see what we want to create (romeo and juliet relationship)
- Click the back button to go back or re click the connection section at the bottom to go back to the information view
- Select the connection element and fill in
    - Component 1 as “house_of_capulet”
    - Component 2 as “house_of_montague”
- Drag and drop onto the canvas
- Select the map variables and add it to the canvas with the following information:
    - Connection ref: 1
    - Variable 1: Juliet
    - Variable 2: Romeo

7. Generate the model

Once you are happy with the model you can create a new cellml file using this data

- Locate the model name section
- Type in a valid name
- Locate the ‘generate model’ button
- Move cursor and click onto the button
- A new save as prompt will be open telling which directory to save the file. Find a suitable place.
- Give the cellml file a new, e.g. “RomeoandJuliet.cellml” with the cellml ending tag being required
- Save the file
- Go to the top right File section and open the file (may take some time to load) to see what the file looks like

8. Seeing a model visually

In text view, if you desire to see what it looks like then in the middle section there are two buttons to change appearance

- Make sure a file is open
- Find the middle section with the multiples squares button
- Click it to observe what it looks like
- If you want to move the elements around you can hold and drag them
- If you want to save the image click the save model, which saves the canvas image as a png
- You can resize the canvas for a smaller look by typing numbers and clicking ‘resize’. But if done you must generate the model again