This guide will introduce you to some basic tasks you can do with SimDiff. Sample models that are shipped with SimDiff are used in this introductory guide. They are located in "<public-documents>\EnSoft\SimDiff\sample models".

The following models are included in the SimDiff distribution:

1. **sldemo_fuelsys_left.slx:** represents the model that you modified or local copy.
2. **sldemo_fuelsys_right.slx:** represents the model someone else modified or copy in the repository.
3. **sldemo_fuelsys_base.slx:** the most recent common ancestor to the left and right models.

You can always restore the original sample models by running the "restore sample models from backup.bat" file located in the "<sample_models_dir>" folder.

Below is a sequence of steps you can follow to get familiar with some of the tasks you can do with SimDiff. Notice that for tasks that involve merging you will need to have the Team edition.

## Visualize a simple block change

1. Start SimDiff
2. Select "Comparison" mode
3. Select the left, right and base models from the "sample models" folder (you can use the *Browse* button or drag and drop files)
4. Click the *Start* button. A window showing the left and right model hierarchies will be shown.
5. To learn more about what each icon or text color in the model hierarchies means, click the *Legend* button located in the top-right side to open the legend dialog. You can keep the legend dialog open as you work with SimDiff.
6. The sample models present a change in the *'rich'* constant block. Select the block in the model hierarchy and the *Attributes* tab at the bottom will list all the attributes for the block. Modified attributes appear in blue.
7. Double click the block to visualize it in Simulink (this could require MATLAB configuration).

## Merge a simple block change

1. Start SimDiff
2. Select "Merge" mode
3. Select the left, right and base models from the "sample models" folder and click the *Start* button.
4. Double click the 'Oxygen Sensor Switching Threshold' block to visualize it in Simulink.
5. Click the *Merge* button located between the hierarchies to merge the change to the left model. You can verify that the change was merged in SimDiff and Simulink windows.

## Merge Action Dependencies

SimDiff detects dependencies among merge actions and displays them on the *Dependencies* tab.

1. Click the *Dependencies* tab which is located next to the *Attributes* tab.
2. Type 'Display1:1' in the *search* box to easily locate the 'Engine Gas Dynamics:3 --> Display1:1' line and select it.
3. Verify that the *Dependencies* tab indicates that the 'Display1' block must be added and that the third outport of the 'Engine Gas Dynamics' subsystem must be added to create the port where the line will be connected to.
4. Merge the line and you'll see that dependencies are automatically merged. Now clear the search filter by clicking the *Clear* button located inside the search box.

## Hierarchy Merge

SimDiff allows you to merge all children of a given container element. So, let's merge all changes under the root system.

1. First, select the 'sldemo_fuelsys_right (Root System)' node then click the *Expand All* button to expand the hierarchy so that all changes can be visualized.
2. There are a lot of unchanged blocks cluttering up the view; let's filter them out by clicking the *All Changes* filter button next to the search box.
3. Merging all changes one at a time would take a while, so let's merge them all at once. With the root system node still selected, click the *Hierarchy Merge* toolbar button.
4. Note that hierarchy merge does not merge conflicts since they require user analysis. You'll see that there is a conflict that remains to be merged on the Constant block named rich, select it to see further information about this change in *Attributes* tab and the *Info Panel* (which is located in the bottom-right of the GUI).
5. Click the *Merge* button to merge the conflict. Now all changes have been merged.
6. Click the *Event Log* tab to see the list of the merge actions that were performed. The event log can be exported to a file by clicking the *Save* button.
7. Now click the *Synchronize* toolbar button to synchronize; this will save the left model then compare the model files again. There should be no changes after synchronizing.
8. Congratulations, you have completed your first model merge!

**Tip:**

SimDiff allows manual editing of the models. That is, changes to a model can be done in its Simulink window and then clicking the *Synchronize* button will update the edits in SimDiff. Note however that these edits are not tracked by the undo system in SimDiff.

## Auditing and Report Generation

1. Make sure SimDiff is closed.
2. Restore the original sample models by running the “restore sample models from backup.bat” file located in the “<sample_models_dir>” folder.
3. Start SimDiff
4. Select “Comparison” mode
5. Select the left, right and base models from the “sample models” folder
6. Click the *Start* button.
7. Select the ‘rich’ block in the model hierarchy and click the Auditing tab.
8. Mark the Reviewed checkbox to mark the change as reviewed and click the Apply button. Notes and Tags can be optionally added.
9. Click the *Generate Peer Review file* from File menu.
10. Specify a file and click the OK button.
11. An Peer Review File will be generated and opened in your default web browser.
12. The report will include an image for each subsystem that has changes and it will list the changes below the image. Note that clicking a subsystem image will show it in its original size.
13. Locate the "rich" change in the report and note that auditing information is included with it.