Altair

HyperWorks

Altair HyperStudy 2019 Tutorials

HS-1036: Setting Up an Excel Model with a Visual Basic Script

altairhyperworks.com

HS-1036: Setting Up an Excel Model with a Visual Basic Script

In this tutorial, you will learn how to:

- Couple HyperStudy with a spreadsheet containing Visual Basic scripts.
- Identify input variables and output responses.

The Excel spreadsheet used in this tutorial can be found in `<hst.zip>/HS-1036/`. Copy the file from this directory to your working directory.

Step 1: Examine the Excel File

1. In Excel, open the `iBeam_withMacros.xls` file. This spreadsheet performs calculation for a top loaded cantivlevered beam with an "I" cross section. The input variables and output responses are labeled for clarity.

   Note: When you create an Excel spreadsheet model, it is important that it is formatted correctly. A variable's value and label can be formatted in two consecutive rows or two consecutive columns. Variable labels should only contain English characters, or a combination of English characters and numbers. If a label is not created for a variable, HyperStudy will assign one by default.

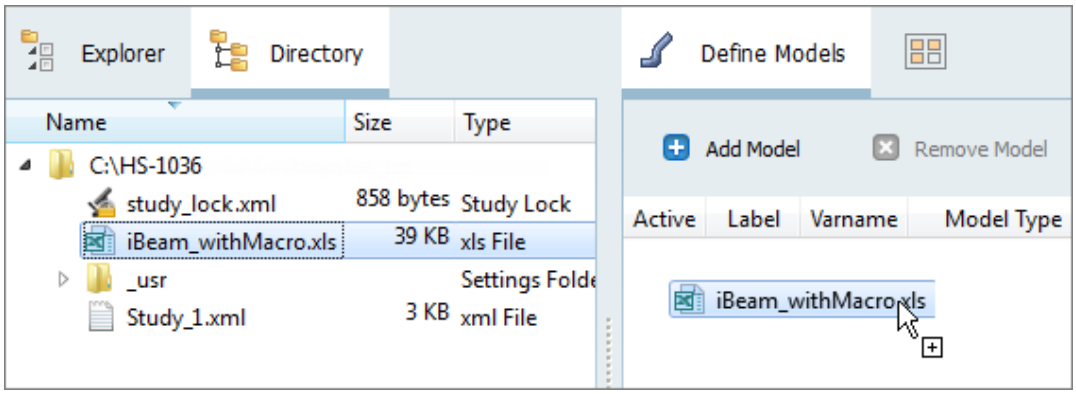
2. In the cell to the right of **Web Thick**, change the value.
3. To update the calculated output responses, click ***Run macro named PerformCalcs***. The formulas and operations to calculate the output response values are contained in a Visual Basic Script macro called "Perform Calculations". When a change is made to one of the input variables, it is not reflected in the output responses until you run the script.

   Note: To run the Visual Basic script macro, you must enable macros in Excel.

4. Save any changes you made to the spreadsheet.

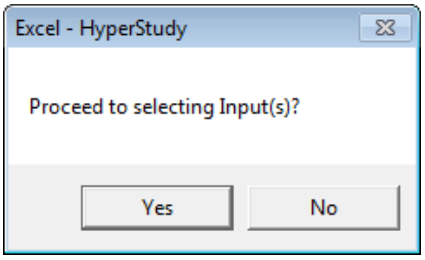
Step 2: Perform the Study Setup

1. Start HyperStudy.
2. To start a new study, click ***File*** > ***New*** from the menu bar, or click  on the toolbar.
3. In the **HyperStudy – Add** dialog, enter a study name, select a location for the study, and click ***OK***.
4. Go to the **Define Models** step.
5. Add a Spreadsheet model.
   a. From the **Directory**, drag-and-drop the `iBeam_withMacro.xls` file into the work area. The **Solver input file** field displays `hst_input.hstp`, this is the name of the solver input file HyperStudy writes during an evaluation.

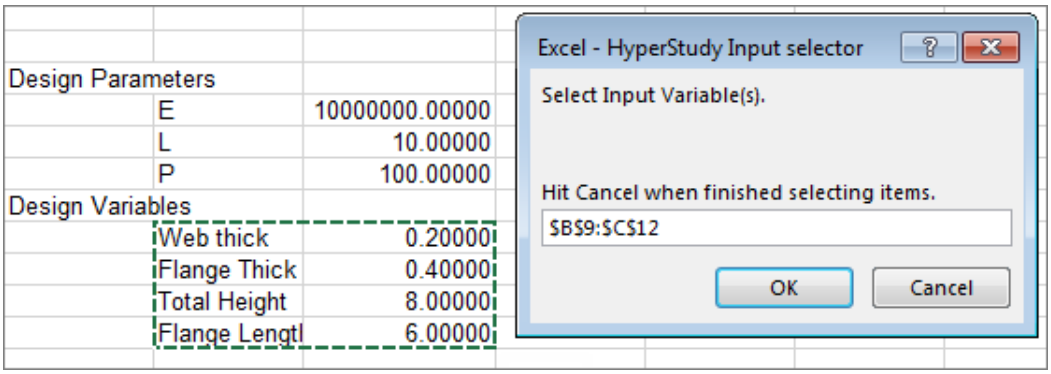


b. In the **Solver input arguments** column, enter `PerformCalcs`. This is the name of the Visual Basic script.

6. Click ***Import Variables***. The `iBeam_withMacro.xls` spreadsheet opens.
7. Add input variables.
   a. In the **Excel - HyperStudy** dialog, click ***Yes*** to begin selecting input variables.



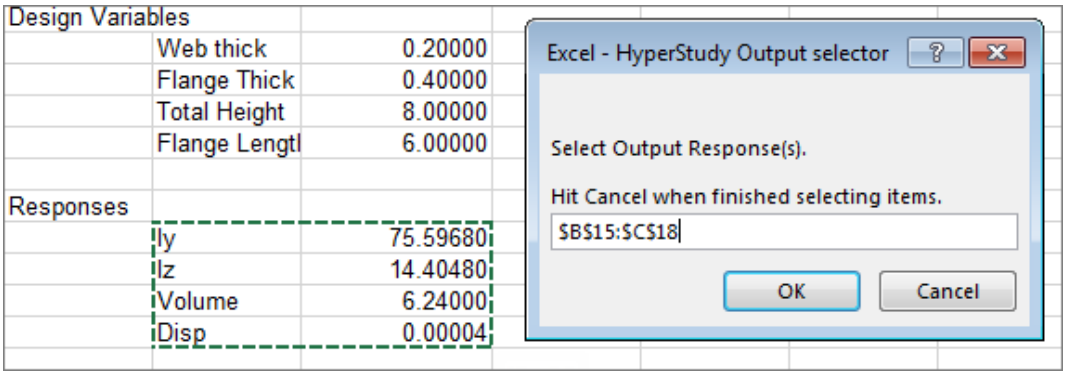
   b. In the spreadsheet, select the cells that contain the input variable's labels and values.



   c. In the **Excel - HyperStudy Input selector** dialog, click ***OK***.
   d. Click ***Cancel*** to stop selecting input variables.
8. Add output responses.

a. In the **Excel - HyperStudy** dialog, click ***Yes*** to begin selecting output responses.

b. In the spreadsheet, select the cells that contain the output response's labels and values.



c. In the **Excel - HyperStudy Output selector** dialog, click ***OK***.

d. Click ***Cancel*** to stop selecting output responses. Four input variables and four output responses are imported from the `iBeam_withMacro.xls` spreadsheet.

9. Go to the **Define Input Variables** step.
10. Review the input variable's lower and upper bound ranges.
11. Go to the **Specifications** step.

Step 3: Perform the System Bounds Check

1. In the work area, set the **Mode** to ***System Bounds Check***.
2. Click ***Apply***.
3. Go to the **Evaluate** step.
4. Click ***Evaluate Tasks***. An `approach/nom_1/` directory is created inside the study directory. The `approaches/nom_1/run__00001/m_1` directory contains the `hst_output.hstp` file, which is the result of the nominal run.
5. When the evaluation is complete, click the ***Evaluation Data*** tab.
6. Examine the run data to ensure that the output response values changed in each evaluation.

	Web thick	Flange Thick	Total Height	Flange Length	Iy	Iz	Volume	Disp	Post Process
1	0.2000000	0.4000000	8.0000000	6.0000000	75.596800	14.404800	6.2400000	4.41e-05	☑
2	0.1800000	0.3600000	7.2000000	5.4000000	49.599060	9.4509893	5.0544000	6.72e-05	☑
3	0.2200000	0.4400000	8.8000000	6.6000000	110.68127	21.090068	7.5504000	3.01e-05	☑

7. Go to the **Define Output Responses** step.

Last modified: v2017.2 (12.1156684)