



Altair

HyperWorks

HS-1700: Simple DOE Study

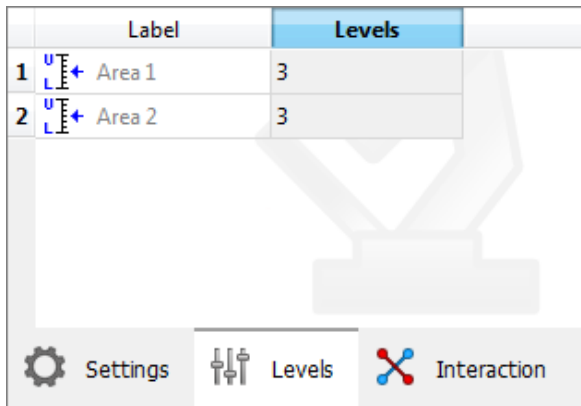
In this tutorial you will learn how to run a DOE study on simple functions defined using a Templex template.

The base input template defines two input variables; DV1 and DV2, labeled X and Y, respectively. The objective of the study is to investigate the two input variables X, Y forming the two functions: $X+Y$ and $1/X + 1/Y - 2$.

Before running this tutorial, you must complete tutorial HS-1010: Simple Study Setup or you can import the archive file `HS-1010.hstx`, available in `<hst.zip>/HS-1700/`.

Step 1: Run a DOE Study

1. In the **Explorer**, right-click and select **Add** from the context menu.
2. In the **Add - HyperStudy** dialog, select **DOE** and click **OK**.
3. Go to the **Specifications** step.
4. In the work area, set the **Mode** to **Full Factorial**.
5. Click the **Levels** tab, and change the number of levels from 2 to 3 to spread the levels between the lower and upper bounds.




6. Click **Apply**.
7. Go to the **Evaluate** step.
8. Click **Evaluate Tasks**. The results of the evaluation display in the work area.

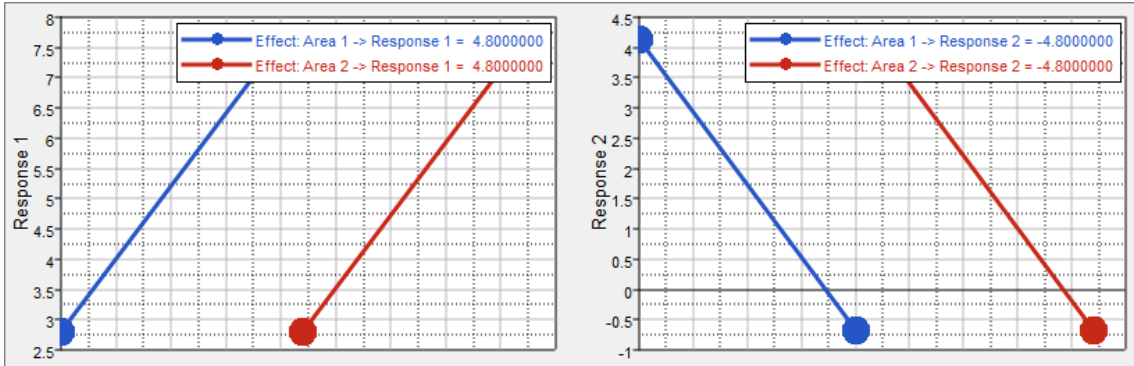
StepIndex	Write	Execute	Extract
1 <input checked="" type="checkbox"/>	Success	Success	Success
2 <input checked="" type="checkbox"/>	Success	Success	Success
3 <input checked="" type="checkbox"/>	Success	Success	Success
4 <input checked="" type="checkbox"/>	Success	Success	Success
5 <input checked="" type="checkbox"/>	Success	Success	Success

9. Go to the **Post-Processing** step.

Step 2: Post Process the Results of the DOE Study

In this step you will review the effects and interaction between both input variables and output responses.

1. Click the **Linear Effects** tab.
 - a. Above the **Channel** selector, click  to plot the linear effects.
 - b. Using the **Channel** selector, select both input variables and output responses.
 - c. Review the effects of Area 1 and Area 2 on Response 1 and Response 2. You can observe that the effects of Area 1 and Area 2 on Response 1 are the same (proportional with a magnitude 4.8). From the second plot, you can observe that the effects of Area 1 and Area 2 on Response 2 are also the same (inversely proportional with a magnitude -4.8). For information on how to calculate the magnitude in DOE refer to Post Processing DOE.



2. Click the **Interactions** tab.
 - a. Using the **Channel** selector, set **Variable A** to **Area 1** and **Variable B** to **Area 2**.
 - b. Review the interactions between Area 1 and Area 2 on Response 1 and Response 2. From both plots, you can observe that there is no interaction between Area 1 and Area 2 for both Response 1 and Response 2.

