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HyperWorks

# HS-1715: Simple Stochastic Study

This tutorial demonstrates how to run a stochastic 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 random variables X, Y forming the two functions X+Y and 1/X + 1/Y − 2.

Before running this tutorial, you must complete tutorial Simple Optimization Study - HS-1710 or you can import the archive file `HS-1710.hstx`, available in `<hst.zip>/HS-1715/`.

Step 1: Run a Stochastic Study

1. In the **Explorer**, right-click and select **Add** from the context menu.
2. In the **Add - HyperStudy** dialog, select **Stochastic** and click **OK**.
3. Go to the **Specifications** step.
4. In the work area, set the **Mode** to **Latin Hypercube**.
5. In the **Settings** tab, change the **Number of runs** to `50`.
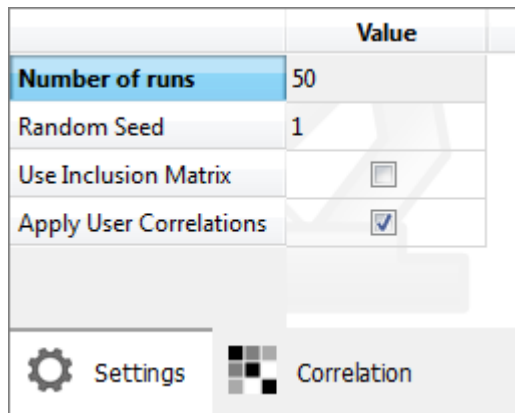
6. Click **Apply**.
7. Go to the **Evaluate** step.
8. Click **Evaluate Tasks**. HyperStudy executes 50 runs and extracts the results.
9. Go to the **Post-Processing** step.

Step 2: Post-Process the Results of the Stochastic Study

In the **Post processing** step of a Stochastic approach, you can access additional tools to review results.

1. Click the **Distribution** tab.
2. Using the **Channel** selector, select **Response 1**.
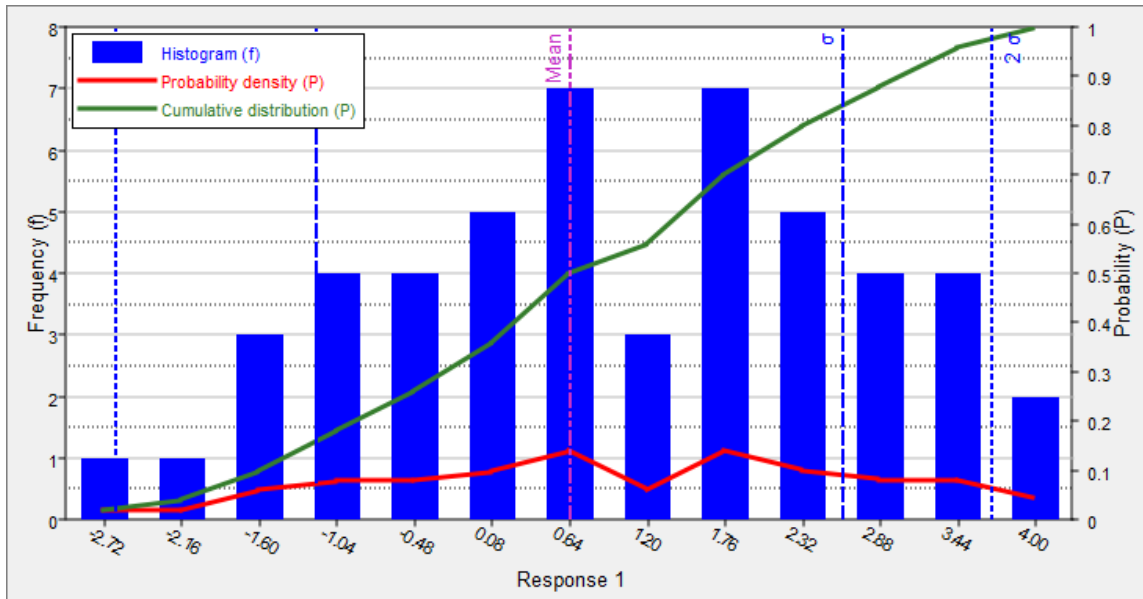
3. Click the **Reliability** tab.

4. Click **Add Reliability**.

5. In the **Add - HyperStudy** dialog, add two reliabilities.

6. Define reliability 1.

    a. Set **Response** to **Response1 (r_1)**.

    b. Set **Bound Type** to **<=** (less than or equal to).

7. Define reliability 2.

    a. Set **Response** to **Response2 (r_2)**.

    b. Set **Bound Type** to **<=** (less than or equal to).

8. Study the effects of bounds on the reliability by entering different values in the **Bound Value** column.

    *   For reliability 1, enter `1.050`. The reliability value of Response_1 to be less than 1.05 is 52%.

    *   For reliability 2, enter `1.830`. The reliability value of Response_2 to be less than ... is ...%.

	Active	Response	Bound Type	Bound Value	Reliability	Probability of Failure
1	✓	Response 1 (m_1_r_1) ▼	<= ▼	1.0500000	0.5200000	0.4800000
2	✓	Response 2 (m_1_r_2) ▼	<= ▼	1.8300000	0.8000000	0.2000000