

CSE-565_Project-1-Part-2---Specification-Based-Testing-Design-of-Experiments
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1. Explanation of the test cases

For total 25 cases created by JMP, It achieves the reasonable coverage because It consists of all possible factor combinations in the test.

2.

The screenshot shows the JMP DOE - Custom Design window. The 'Design' section is expanded, displaying a table with 25 runs. The table columns are Run, Type of Phone, Parallel Tasks Running, Connectivity, Memory, and Battery Level. The runs are numbered 1 through 25, showing various combinations of phone types (iPhone 8, Google Pixel 3, Samsung S9, Huawei Mate, iPhone X) and their respective connectivity, memory, and battery levels.

Run	Type of Phone	Parallel Tasks Running	Connectivity	Memory	Battery Level
1	iPhone 8	No	Wireless	1 GB	60 - 79%
2	Google Pixel 3	Yes	3G	1 GB	80 - 100%
3	Samsung S9	Yes	Edge	4 GB	60 - 79%
4	Google Pixel 3	No	Edge	6 GB	< 20 %
5	Huawei Mate	Yes	3G	2 GB	60 - 79%
6	Google Pixel 3	Yes	Wireless	2 GB	20 - 39%
7	Google Pixel 3	Yes	Edge	4 GB	40 - 59%
8	iPhone X	Yes	Wireless	4 GB	40 - 59%
9	Huawei Mate	Yes	4G	6 GB	20 - 39%
10	iPhone X	Yes	4G	1 GB	< 20 %
11	iPhone X	No	Edge	2 GB	80 - 100%
12	Samsung S9	Yes	3G	4 GB	< 20 %
13	iPhone X	Yes	Edge	6 GB	60 - 79%
14	Samsung S9	No	Edge	1 GB	20 - 39%
15	Huawei Mate	No	Edge	4 GB	80 - 100%
16	Samsung S9	No	4G	2 GB	40 - 59%
17	iPhone 8	Yes	Edge	4 GB	20 - 39%
18	iPhone X	No	3G	4 GB	20 - 39%
19	iPhone 8	No	3G	6 GB	40 - 59%
20	iPhone 8	Yes	Edge	2 GB	< 20 %
21	Samsung S9	Yes	Wireless	6 GB	80 - 100%
22	Huawei Mate	Yes	Edge	1 GB	40 - 59%
23	Google Pixel 3	No	4G	4 GB	60 - 79%
24	Huawei Mate	No	Wireless	4 GB	< 20 %
25	iPhone 8	Yes	4G	4 GB	80 - 100%

The 'Design Evaluation' section is also visible, showing options for Power Analysis, Prediction Variance Profile, Fraction of Design Space Plot, Prediction Variance Surface, Estimation Efficiency, Alias Matrix, Color Map on Correlations, and Design Diagnostics. The 'Output Options' section is expanded, showing 'Data Table Options' with checkboxes for 'Save X Matrix', 'Simulate Responses', and 'Include Run Order Column'. The 'Run Order' is set to 'Randomize'.

Custom Design						
Custom Design						
Design	Custom Design					
Criterion	D Optimal					
Model						
Evaluate Design						
Generalized Regression						
DOE Dialog						
Columns (6/0)						
Type of Phone *						
Parallel Tasks Running *						
Connectivity *						
Memory *						
Battery Level *						
Y *						
Rows						
All rows	25					
Selected	0					
Excluded	0					
Hidden	0					
Labeled	0					
Type of Phone	Parallel Tasks Running	Connectivity	Memory	Battery Level		
1 iPhone 8	No	Wireless	1 GB	60 - 79%		
2 Google Pixel 3	Yes	3G	1 GB	80 - 100%		
3 Samsung S9	Yes	Edge	4 GB	60 - 79%		
4 Google Pixel 3	No	Edge	6 GB	< 20 %		
5 Huawei Mate	Yes	3G	2 GB	60 - 79%		
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9 Huawei Mate	Yes	4G	6 GB	20 - 39%		
10 iPhone X	Yes	4G	1 GB	< 20 %		
11 iPhone X	No	Edge	2 GB	80 - 100%		
12 Samsung S9	Yes	3G	4 GB	< 20 %		
13 iPhone X	Yes	Edge	6 GB	60 - 79%		
14 Samsung S9	No	Edge	1 GB	20 - 39%		
15 Huawei Mate	No	Edge	4 GB	80 - 100%		
16 Samsung S9	No	4G	2 GB	40 - 59%		
17 iPhone 8	Yes	Edge	4 GB	20 - 39%		
18 iPhone X	No	3G	4 GB	20 - 39%		
19 iPhone 8	No	3G	6 GB	40 - 59%		
20 iPhone 8	Yes	Edge	2 GB	< 20 %		
21 Samsung S9	Yes	Wireless	6 GB	80 - 100%		
22 Huawei Mate	Yes	Edge	1 GB	40 - 59%		
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24 Huawei Mate	No	Wireless	4 GB	< 20 %		
25 iPhone 8	Yes	4G	4 GB	80 - 100%		

3. An assessment of the test cases

The maximum number of combinations ($800 = 5 \times 2 \times 4 \times 4 \times 5$) equally to 800. In this case, we use DOE Pairwise Combinations to create only 25 cases which achieve the reasonable code coverage. For total 25 cases, it consists of all possible factor combinations in the test and follows the guidelines of the DOE technique.

4. An assessment of the tool

In this report, I used JMP to create the test cases. JMP is a statistic software and very easy to get started.

JMP can easily solve the most complex data challenges. It is widely used in various industries and businesses if only anyone has big data solution needs

For this project, I just easily open JMP and choose DOE-Custom Design. Then I can input the parameters and quickly generate test cases.

DOE - Custom Design 2

Custom Design

Responses

Response Name	Goal	Lower Limit	Upper Limit	Importance	Lower Detection Limit	Upper Detection Limit
Y	Maximize

Factors

Name	Role	Changes	Values
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Covariate/Candidate Runs

Load a set of candidate runs for covariates from the current data table.

Specify Factors

Add a factor by clicking the Add Factor button. Double click on a factor name or level to edit it.

In addition, JMP is also easy install and setup. I just download it from ASU app page but you can also download it from the official website. It provided licensed and free trial version.

https://www.jmp.com/zh_tw/home.html

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Symrise, Egon Gross