HW 06: Practice with Orthogonal Array Testing

Part 1:

Given Information:

OS: {OSX, Linux, Win10}

Browser: {Safari, Firefox, Chrome}

Student Type: {U, G}

Student Location: {C, R}

1. What is the total number of test cases for exhaustive testing? Show the exhaustive list of all combinations.
- Total number of test cases for exhaustive testing:
  3 Operating Systems X 3 Browsers X 2 Student types X 2 Student locations = 36 test cases

	OS	Browser	Student Type	Student Location
1.	OSX	Safari	U	R
2.	OSX	Safari	U	C
3.	OSX	Safari	G	R
4.	OSX	Safari	G	C
5.	OSX	Firefox	U	R
6.	OSX	Firefox	U	C
7.	OSX	Firefox	G	R
8.	OSX	Firefox	G	C
9.	OSX	Chrome	U	R
10.	OSX	Chrome	U	C
11.	OSX	Chrome	G	R
12.	OSX	Chrome	G	C
13.	Linux	Safari	U	R
14.	Linux	Safari	U	C
15.	Linux	Safari	G	R
16.	Linux	Safari	G	C
17.	Linux	Firefox	U	R
18.	Linux	Firefox	U	C
19.	Linux	Firefox	G	R
20.	Linux	Firefox	G	C
21.	Linux	Chrome	U	R
22.	Linux	Chrome	U	C
23.	Linux	Chrome	G	R
24.	Linux	Chrome	G	C
25.	Win10	Safari	U	R
26.	Win10	Safari	U	C
27.	Win10	Safari	G	R
28.	Win10	Safari	G	C
29.	Win10	Firefox	U	R
30.	Win10	Firefox	U	C

31.	Win10	Firefox	G	R
32.	Win10	Firefox	G	C
33.	Win10	Chrome	U	R
34.	Win10	Chrome	U	C
35.	Win10	Chrome	G	R
36.	Win10	Chrome	G	C

2. What are the factors and levels for each factor?
- 4 Factors (2 with 3 Levels and 2 with 2 levels)
  - o Factor => OS
    - Levels => OSX, Linux, Win10
  - o Factor => Browser
    - Levels => Safari, Firefox, Chrome
  - o Factor => Student Type
    - Levels => U, G
  - o Factor => Student Location
    - Levels => C, R
3. How many test cases do we need for Pairwise Orthogonal Array Testing?
- Since 2 variables have 3 values each, Hence, total 9 tests (3 X 3) and L_9 Array will be used.
4. Select and show the proper Orthogonal testing?
- Since there are 9 tests, L_9 array will be used.

Testcases	Process Parameters			
	A	B	C	D
1	0	0	0	0
2	0	1	1	1
3	0	2	0	0
4	1	0	1	1
5	1	1	0	0
6	1	2	1	1
7	2	0	0	0
8	2	1	1	1
9	2	2	0	0

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5. Populate and show Orthogonal Array with the appropriate values for this problem?

Testcases	Process Parameters			
	OS	Browser	Student Type	Student Location
1	OSX	Safari	U	R
2	OSX	Firefox	G	C
3	OSX	Chrome	U	R
4	Linux	Safari	G	C
5	Linux	Firefox	U	R
6	Linux	Chrome	G	C
7	Win10	Safari	U	R
8	Win10	Firefox	G	C
9	Win10	Chrome	U	R

Part 2:
Given Information:
Sale Types: {On-Line [O], Retail in-store [R]}
Store Location: {USA, Canada}
Payment mode: {Visa, American Express}
Service: {Selling, Maintenance and Sales}

1. How many combinations of these 4 variables are there?
- 2 Sale types * 2 Store Location * 2 Payment mode * 2 Service = 16 Configurations
2. How many tests do you need to cover all combinations of any one variable?
- 4 combinations
3. What is the orthogonal array which you can use for this problem? How many testcases does it represent?
- 4 variables with 2 values each would require L_8 array.
4. If you had 7 variables with 2 values each, which array would you use?
- 7 variables with 2 value each would still require L_8 array.
5. How many test cases does an L_8 array represent?
- 8 test cases

Part 3:
Given Information:
Provider: {Kindle, iPad, Zok}
Classes of Book: {Textbooks, Poetry, Graphic Novels, Regular Novels}
Languages: {English, Spanish, Japanese}

1. What is the total number of test cases for all combinations?
- 3 Providers * 4 Classes of Book * 3 Languages = 36 Combinations
2. What is the minimum number of tests for pairwise testing?
- 3 * 4 = 12 tests (minimum)
3. You decide to use orthogonal arrays to help with your testing. Which table should you use?
- With 3 variables, 2 variables with 3 values and 1 variable with 4 values, L_{12} array table will be used

Part 4:
Given Information:
Variables: {OS, Browser, Languages}
Values: {5, 3, 3}

1. How many combinations are there of these variables?
- 5 OS * 3 Browser * 3 Languages = 45 Combinations
2. Which orthogonal array should you use?
- With 3 variables (2 variables with 3 values and 1 variable with 5 values) then 3*5 = 15 tests and method used is orthogonal pair wise. Hence, according to Taguchi Orthogonal Array design for five level factors, L_{25} orthogonal array will be used.
3. How many individual tests do you need to run for all combinations of two variables?
- 3*5 = L_{15}