

This problem concerns conjoint analysis.

A large-scale property developer engages a researcher to estimate the potential demand for different types of inner-city apartments. The developer asked the researcher to consider the following attributes and levels:

Attribute	Levels
View	Sea or City skyline
Interior design	Classical or contemporary
Number of bedrooms	2 or 3

The researcher decides to conduct a fractional factorial experiment, according to the design shown in the table below.

Profile	View	Interior Design	No. of. Bedrooms
1	Sea view	Contemporary	3
2	City skyline	Classical	2
3	City skyline	Contemporary	2
4	Sea view	Classical	3
5	Sea view	Contemporary	2
6	City skyline	Classical	3

The preferences for one of the study participant resulted in following regression coefficients.

<i>Coefficients</i>	
Sea view	0
Classical design	-1
2 bedrooms	2

The following parts of the question refer to this study participant.

- i) Calculate the utility for each possible profile.
- ii) If all possible profiles were available for purchase, estimate the purchase probability of each profile.
- iii) Calculate the importance of each attribute.

Solution:

- i) Utilities: Utility of profile 7 (Sea view, classical, 3 bedroom) = $0 - 1 + 0 = -1$;

Profile	View	Interior Design	No. of. Bedrooms	Utility
1	Sea view	Contemporary	3	0
2	City skyline	Classical	3	-1
3	City skyline	Contemporary	2	2
4	Sea view	Classical	2	1
5	City skyline	Classical	2	1
6	Sea view	Contemporary	2	2
7	Sea view	Classical	3	-1
8	City skyline	Contemporary	3	0

- ii) Purchase probabilities

Purchase probabilities are estimated using logit model assuming all 8 product profiles are offered in the market.

Purchase probability of profile 1 = $\exp(0) / ((\exp(0)+\exp(-1)+\exp(2)+\dots\exp(0))$

Profile	View	Interior Design	No. of. Bedrooms	Purchase probability
1	Sea view	Contemporary	3	4%
2	City skyline	Classical	3	2%
3	City skyline	Contemporary	2	32%
4	Sea view	Classical	2	12%
5	City skyline	Classical	2	12%
6	Sea view	Contemporary	2	32%
7	Sea view	Classical	3	2%
8	City skyline	Contemporary	3	4%

iii) Attribute importances

Importance of attribute = range of PWs of that attribute/total range of PW's of all attributes

Importance of Interior design = $1/(0+1+2) = 1/3 = 33\%$

Attribute	Level	Part worth	Range of PWs	Importance
View	Sea view	0	0	0%
	City skyline	0		
Interior design	Contemporary	0	1	33%
	Classical	-1		
Number of bedrooms	2	2	2	67%
	3	0		