

# Multivariate data analysis (short computational exercise)



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BUSTER**

Essay, Other Multivariate Data Analysis (Short computational exercise)

Question Answer From the results of the correlation analysis, there is a negative correlation analysis between the occupational status and the number of visits to the Gymnasium in the last 4 weeks. The coefficient of linear correlation is  $-0.077$ . This is a weak negative correlation based on the hypothesis that there is an association between the two variables.

Fig 1: Results of Linear Correlation Analysis

Question 2: Answer

The hypothesis is that there is an association between the age and the level of satisfaction. From the linear correlation analysis, we run linear correlation between Q2 and Q7. The finding is that there is a strong negative correlation between the two variables, the age of the level of satisfaction. The coefficient of linear correlation was found to be  $-0.154$ .

Correlations

Q2

Q7

Q2

Pearson Correlation

1

$-.154^*$

Sig. (2-tailed)

$.021$

N

225

225

Q7

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Pearson Correlation

-. 154\*

1

Sig. (2-tailed)

. 021

N

225

225

\*. Correlation is significant at the 0. 05 level (2-tailed).

Fig 2: Linear Correlation Results

Question 3: Answer

Q6

Frequency

Percent

Valid Percent

Cumulative Percent

Valid

50

46

20. 4

20. 4

20. 4

52

2

. 9

. 9

21. 3

53

1

. 4

. 4

21. 8

54

1

. 4

. 4

22. 2

55

31

13. 8

13. 8

36. 0

56

2

. 9

. 9

36. 9

57

1

. 4

. 4

37. 3

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58

2

. 9

. 9

38. 2

59

2

. 9

. 9

39. 1

60

20

8. 9

8. 9

48. 0

61

1

. 4

. 4

48. 4

62

1

. 4

. 4

48. 9

63

1

. 4

. 4

49. 3

65

7

3. 1

3. 1

52. 4

67

1

. 4

. 4

52. 9

68

1

. 4

. 4

53. 3

70

14

6. 2

6. 2

59. 6

71

1

. 4

. 4

60. 0

75

8

3. 6

3. 6

63. 6

76

2

. 9

. 9

64. 4

77

1

. 4

. 4

64. 9

80

3

1. 3

1. 3

66. 2

83

1

. 4

. 4

66. 7

85

6

2. 7

2. 7

69. 3

86

1

. 4

. 4

69. 8

87

1

. 4

. 4

70. 2

90

4

1. 8

1. 8

72. 0

93

2

. 9

. 9



72.9

94

1

.4

.4

73.3

95

5

2.2

2.2

75.6

99

1

.4

.4

76.0

100

31

13.8

13.8

89.8

105

13

5.8

5.8

95.6

110  
5  
2.2  
2.2  
97.8  
115  
3  
1.3  
1.3  
99.1  
160  
1  
.4  
.4  
99.6  
320  
1  
.4  
.4  
100.0  
Total  
225  
100.0  
100.0

Fig 3: Descriptive Statistics of the willingness to pay

From the frequency descriptions, the number that is willing to give at least  
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£75 is 39.7%. The hypothesis therefore, scores 39.7% positive response. The remaining percentage (60.3%) is the score for the willingness to pay less than £75.

#### Question 4: Answer

The hypothesis is that there is no association between gender aspect and the willingness to pay. We run a linear correlation analysis on the two variables Q1 and Q6. The findings are as follows:

#### Correlations

Q1

Q6

Q1

#### Pearson Correlation

1

.394\*\*

Sig. (2-tailed)

.000

N

225

225

Q6

#### Pearson Correlation

.394\*\*

1

Sig. (2-tailed)

.000

N

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225

225

\*\* . Correlation is significant at the 0. 01 level (2-tailed).

Fig 4: Gender influence on the willingness to pay

There is a positive linear correlation coefficient of 0. 394. This indicates that the gender group positively influences the willingness to pay is positively influenced by the gender. It therefore leads to a conclusion that females are willing to pay more than the males. This is against the hypothesis.

Question 5: Answer

The hypothesis is that the net weekly income positively influences the willingness to pay. We run a linear correlation analysis using two variables

Correlations

Q4

Q6

Q4

Pearson Correlation

1

. 492\*\*

Sig. (2-tailed)

. 000

N

225

225

Q6

Pearson Correlation

. 492\*\*

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1

Sig. (2-tailed)

.000

N

225

225

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Fig 5: Influence of Net Income on the Willingness to pay

The coefficient of linear correlation between the two variables is 0.492. This is a strong positive linear correlation, indicating that the willingness to pay increases as the net income per week increases, as per the hypothesis.

Fig 6: Willingness to pay against Net Income

The gradient of the plotted line is 0.242. A person earning £300 will be willing to pay  $300 * 0.242 = £72$ .

Question 6: Answer

Fig 7: Multivariate Linear Regression

(i) The significance of gender (Q1) in the multiple regressions is 0. It shows that the regression model did not consider the gender factor.

Fig 7: Gender and the Willingness to pay

Fig 8: Occupational Status and willingness to pay

The significance of the occupational Status (Q3) is 0.492. It was the most influential variable in the linear regression model.

Fig 9: Net weekly Income and the willingness to pay

The net weekly income was of significance. The linear regression model did not make use of it.

(ii) Similarity

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The multiple regressions and the two variable linear regression model give zero significance for the gender and net weekly income.

Difference

The multiple regressions shows the three plots for net weekly income, occupational status and the gender factor in a single regression model. The two variable linear regression on the other hand shows a single plot between the dependent and independent variable.

(iii). Net Weekly Income

A person with weekly income of £500 is willingness £110.

(iii). Net income

iv. A female earning weekly income of £400 is willingness £95.