Example of math 10 finals project report

Philosophy, Freedom

Math 10 Final Project

A survey of 50 randomly selected students was asked the following questions at school to determined their credit card spending behavior and card characteristics. The following questions were asked.

- How many times per week do you use your card? Let this variable be denoted by x.
- How much money do you spend on your card weekly? Let this variable be denoted by y.
- Which banks do you used your card with? Let this variable be denoted by x. bank.
- Do you use credit card more than the debit card? Let this variable be denoted by x. use.

The result of the interview is reflected on the following table.

Legend: Question 2:

Question 3:

Analyzing the data above, we have the following.

The table above shows that most of the students (12) used their credit cards at least three (3) times a day, while eight of the students say they used their cards once, twice and four times a week respectively. A total of 14 students on the other hand say that they use their cards at least 5 times or more in a week.

It can be gleaned from the table above that 16 of the student interviewed spent less than $50 dollars on their credit cards in a week while 15 of them say they spend between $100 - $200 weekly. Eleven (11) students on the

other hand say that they send between $51 - $100 dollars from their credit card weekly and only 8 among the fifty student say they spend more $200 on their credit cards.

The graph above shows that 32% of the students used their credit cards with Standard Charter, 22 % have cards with Citi Bank, 16% have banks with Bank of America and HCBC, respectively, 10% had banks with Chase Bank and only 4% used other banks.

The graph above indicates that 54% of the students used their cards as credit cards while the other 46 % used their cards as debit cards.

The Mean of variable x is 3. 54 times and its standard deviation is 1. 886688 times. The 95% Confidence interval for this variable is thus (-1. 85129 My assumptions for completing these confidence intervals are that both variable x and y are normally distributed since the sample size is above 30.

I want now to conduct a hypothesis test with a null hypothesis that the mean of variable x is the same under variable x. use against the alternative hypothesis that the means are not equal under this variable. To test these hypotheses, we use Welch’s approximation of two sample test.

In comparing the means by variable x, we get the t-test value as 2. 343021. according to our case, we shall assume a two tailed test since we shall reject our null hypothesis if the value is too large or too small. Calculating the P-value of this test, we find it is 2. 39% at a t-density of 42 degrees of freedom. Thus we reject our null hypothesis under 5% degrees of freedom that the two means are equivalent.

Again testing for the means of variable y under variable x. use, we find out t-test value as 1. 556739. Our p-value using a t-density of 82 estimated

degrees of freedom is 12. 337%. Thus under a test of 5% significance kevel, we have a strong evidence to accept the null hypothesis that the means of variable are equivalent under variable x. use.

Comparing variable x and y, variable x which is, how many times per week do you use your card? , shall be the the independent variable and variable y, which is how much money do you spend on your card weekly? , shall be the dependent variable.

My dependent variable is the amount spent on the card every week, variable y.

The data looks uncorrelated since the scatter diagram exhibits a lot of variations.

My regression line equation is y= 2. 26144 + 0. 01089x

R is 0. 01880957 and R-squared: 0. 0003538. This implies that the two variables have negligible positive correlation.

Here again I test a null hypothesis that ‘ beta one’= 0, against the alternative that it is not equal to zero. I use the F-test od(1 and 48) degrees of freedom. My p-value is 0. 8968. Thus I accept the null hypothesis that ‘ Beta one’ is Zero. Implying zero correlation between the two variables.

My next three predicted values are 2. 34856 , 2. 35945 and 2. 37034. Thus I don’t need to worry about the extrapolation.

The Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(> F)

x 1 0. 021 0. 0207 0. 017 0. 8968

Residuals 48 58. 479 1. 2183

My numerator degrees of freedom= 1, Denominator degrees of freedom= 48.

My F-statistic= 0. 8968 and p-value= 0. 8968. I Thus accept the null hypothesis that the choice of bank of a student is not related to the amount they spend on their credit cards.

- I used R-software for statistical programming to perform the inferential statistics