

ST2007 – Applications in Statistical Inference

Assignment – 04

Index Number: s14878

Question 01

a.

Statistical test: one sample T test

Reason for the choice: we want test whether the mean of a population is statistically different from a known or hypothesized value when population standard deviation is unknown.

b.

The dependent variable must be continuous (interval/ratio).

The observations are independent of one another.

The dependent variable should be approximately normally distributed

The dependent variable should not contain any outliers.

c.

$H_0: \mu = 400 \text{ g}$

$$H_1 : \mu < 400 \text{ g}$$

μ is the population mean of herrings weight

d.

Path: Analyze --> Compare Means ---> One-Sample T Test

e.

Decision rule: If $p \leq \alpha$, then reject H_0 .

Statistical conclusion: $\alpha=0.05$

$p= 0.01$

$0.01 < 0.05$

Therefore we reject H_0 .

General conclusion: At 5% significance level, there is enough evidence to conclude that the mean of herrings weight is less than 400 g

f.

$\alpha = 0.01$ and $p = 0.01$

$\alpha = p$ Therefore we reject H_0 .

Therefore conclusion is same

g.

Old Value		New Value	
Option	Value	Option	Value
Range of the Lowest through value	400	value	Female
Range	400 through 600	value	Male

Question 02

a.

i.

Graphical representation: histogram

Reason for the choice: Quantitative variable

ii.

Path (including how the fields in the corresponding SPSS window should be filled): Graphs --> legacy dialogs --> histogram

iii.

Statistical test: Anova test

iv.

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4$

$H_1 : \mu_i \neq \mu_j$ (for at least one pair of $[i, j]$)

v.

Yes

b.

A	Percent increment
B	<i>Increment</i> = (New_Salary – Old_Salary) / Old_Salary *100
C	Employee status

c.

i.

Statistical test: Binomial Test

Reason: they want to detect proportion of employees who has completed more than 100 over time hours is 0.75. It has a dichotomous variable. Therefore, this question is binomial test question.

ii.

$H_0 : P = 0.75$

$H_1 : P \neq 0.75$

Where p is the proportion of

iii.

Decision rule: If $p \leq \alpha$, then we reject H_0 .

Statistical conclusion: $p = 0.000$ & $\alpha = 0.05$

$p < \alpha$

Therefore, we do reject H_0 .

General conclusion: we do reject H_0 . There is not enough evidence to conclude that, the proportion of employees who has completed more than 100 over time hours is 3/4 0 at 0.05 significance level. Therefore, the proportion of employee whose completed more than 100 .

Question 03

	True/False	Justification
A	False	List wise to cases with non-missing value. It will use all the non-missing values for given values
B	False	Not allow variable names
C	True	When there is a large value for the n value distribution is approximately bell and symmetric in shape But when there is small n value the shape of the distribution change according to the p value of the distribution.
D	True	conducting chi-squared test for one variable for summarized data the expected values should match the numerical order of the categorical variable.
E	False	When we split data using the Compare groups option and then run a statistical analysis in SPSS, output will be displayed in single table