1. Cutlet.mtw

Business problem- whether there is any difference in diameter of cutlet btwn two units.

Normality test-

Ho = data is normal.

Ha=data not normal.

Unit A -> p-value=0.287> 0.05 accept Ho

Unit B -> p-value=0.687>0.05 accept Ho

This shows data follows normal distribution.

Variance test –

Ho= var of unitA is equal to var of unitB

Ha=var of unitA is not equal to var of unitB

p-value=0.297 >0.05 accept Ho

2 sample t-test

Ho= average samples diameter of unit A = average samples diameter of unit B

Ha= average samples diameter of unit A NOT= average samples diameter of unit B

p-value=0.472 > 0.05 accept Ho

conclusion=> from our hypothesis testing we came to know that there is NO difference in diameter of cutlets of unitA and unitB.

1. LabTat.mtw

Buissness objective= To determine whether there is any difference in average TAT among the different laboratories.

Normality test-

Ho= data is normal

Ha= data is not normal.

Lab1-> p-value=0.532>0.05 accept Ho

Lab2-> p-value=0.733>0.05 accept Ho

Lab3 -> p-value= 0.577>0.05 accept Ho

Lab4 -> p-value=0.419>0.05 accept Ho

Data is normally distributed.

Variance test-

Ho= var of all labs are equal.

Ha= var of atleast one lab is different.

p-value=0.07>0.05 accept Ho.

Var of al Lab samples are equal.

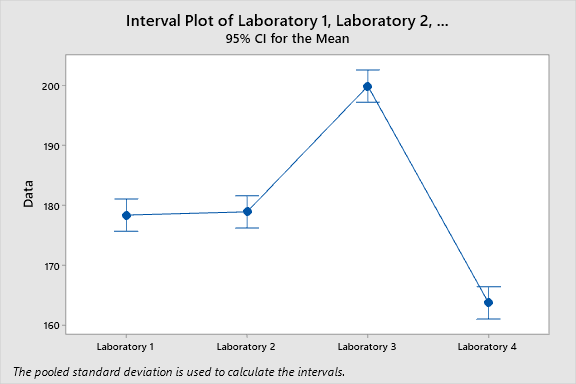
Performing one-way ANOVA test-

Ho=average TAT value of all Lab’s are equal.

Ha=average TAT value of any one Lab is not equal to others.

p-value=0.000<0.05 accept Ha

conclusion=> it means that there is difference in average TAT values among different laboratories. From the interval plot we can also see that.



1. Buyersratio.mkw

Ho= Proportions of Male and Female are same

Ha= Proportions of Male and Female are not same

Performing chi-square test for equal proportion=>

BUYERRATIO.CSV

**Chi-Square Test for Association: Observed Values, Worksheet columns**

**Rows: Observed Values   Columns: Worksheet columns**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **East** | **West** | **North** | **South** | **All** |
|  |  |  |  |  |  |
| Males | 50 | 142 | 131 | 70 | 393 |
|  | 42.8 | 146.8 | 131.1 | 72.3 |  |
|  |  |  |  |  |  |
| Females | 435 | 1523 | 1356 | 750 | 4064 |
|  | 442.2 | 1518.2 | 1355.9 | 747.7 |  |
|  |  |  |  |  |  |
| All | 485 | 1665 | 1487 | 820 | 4457 |

*Cell Contents  
      Count  
      Expected count*

**Chi-Square Test**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Chi-Square** | **DF** | **P-Value** |
| Pearson | 1.596 | 3 | 0.660 |
| Likelihood Ratio | 1.535 | 3 | 0.674 |

p-value=0.660>0.05 accept null hypothesis.

Conclusion=> proportions of males and females across different regions are same.

1. Fantaloons.mkw

Ho= Proportions of Male and Female are same

Ha= Proportions of Male and Female are not same.

Performing 2-proportion test=>

FALTOONS.CSV

**Test and CI for Two Proportions: Weekdays, Weekend**

**Method**

|  |
| --- |
| Event: Male |
| p₁: proportion where Weekdays = Male |
| p₂: proportion where Weekend = Male |
| Difference: p₁ - p₂ |

**Descriptive Statistics**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **N** | **Event** | **Sample p** |
| Weekdays | 400 | 113 | 0.282500 |
| Weekend | 400 | 167 | 0.417500 |

**Estimation for Difference**

|  |  |
| --- | --- |
| **Difference** | **95% CI for Difference** |
| -0.135 | (-0.200438, -0.069562) |

*CI based on normal approximation*

**Test**

|  |  |  |  |
| --- | --- | --- | --- |
| Null hypothesis | H₀: p₁ - p₂ = 0 | | |
| Alternative hypothesis | H₁: p₁ - p₂ ≠ 0 | | |
| **Method** | | **Z-Value** | **P-Value** | |
| Normal approximation | | -4.04 | 0.000 | |
| Fisher's exact | |  | 0.000 | |

p-value=0.000<0.05 reject null hypothesis

hence proportion of male and female is not same.

Now we find whose proportion is higher.

Ho= Proportions of Male is less than or equal to Female

Ha= Proportions of Male is greater than Female.

FALTOONS.CSV

**Test and CI for Two Proportions: Weekdays, Weekend**

**Method**

|  |
| --- |
| Event: Male |
| p₁: proportion where Weekdays = Male |
| p₂: proportion where Weekend = Male |
| Difference: p₁ - p₂ |

**Descriptive Statistics**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **N** | **Event** | **Sample p** |
| Weekdays | 400 | 113 | 0.282500 |
| Weekend | 400 | 167 | 0.417500 |

**Estimation for Difference**

|  |  |
| --- | --- |
| **Difference** | **95% Upper Bound for Difference** |
| -0.135 | -0.080083 |

*CI based on normal approximation*

**Test**

|  |  |  |  |
| --- | --- | --- | --- |
| Null hypothesis | H₀: p₁ - p₂ = 0 | | |
| Alternative hypothesis | H₁: p₁ - p₂ < 0 | | |
| **Method** | | **Z-Value** | **P-Value** | |
| Normal approximation | | -4.04 | 0.000 | |
| Fisher's exact | |  | 0.000 | |

P-value <0.05 and hence we reject null. Hence proportion of Male is greater than Female.

1. Customerorder form.csv

Buissness objective=> to check whether the defective % varies in different centres or not.

Ho= diffective% in every centre is same.

Ha=diffective % in atleast one centre is different.

Performing chi-square test for the given discrete data.

Converted data into two column using stack function.

WORKSHEET 2

**Chi-Square Test for Association: Subscripts, C2**

**Rows: Subscripts   Columns: C2**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Defective** | **Error Free** | **All** |
|  |  |  |  |
| India | 20 | 280 | 300 |
|  | 28.25 | 271.75 |  |
|  |  |  |  |
| Indonesia | 33 | 267 | 300 |
|  | 28.25 | 271.75 |  |
|  |  |  |  |
| Malta | 31 | 269 | 300 |
|  | 28.25 | 271.75 |  |
|  |  |  |  |
| Phillippines | 29 | 271 | 300 |
|  | 28.25 | 271.75 |  |
|  |  |  |  |
| All | 113 | 1087 | 1200 |

*Cell Contents  
      Count  
      Expected count*

**Chi-Square Test**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Chi-Square** | **DF** | **P-Value** |
| Pearson | 3.859 | 3 | 0.277 |
| Likelihood Ratio | 4.084 | 3 | 0.253 |

p-value=0.277>0.05 we accept null hypothesis.

Conclusion -> there is no variation in diffective % in different centres.