Q. A F&B manager wants to determine whether there is any significant difference in the diameter of the cutlet between two units. A randomly selected sample of cutlets was collected from both units and measured? Analyze the data and draw inferences at 5% significance level. Please state the assumptions and tests that you carried out to check validity of the assumptions.

Minitab File : **Cutlets.mtw**

**Ans: Ho:** No difference between the diameter of the cutlets of two units

**Ha:** There is a difference between the diameter of the cutlets of two units

Two sample t test is performed as two different sample is present :

pvalue=0.4722394724599501

as pvalue> 0.05=>accept Ho (Null Hypothesis)

**Inference:** No difference between the diameter of the cutlets of two units

Q. A hospital wants to determine whether there is any difference in the average Turn Around Time (TAT) of reports of the laboratories on their preferred list. They collected a random sample and recorded TAT for reports of 4 laboratories. TAT is defined as sample collected to report dispatch. Analyze the data and determine whether there is any difference in average TAT among the different laboratories at 5% significance level

Minitab File: **LabTAT.mtw**

**Ans: Ho:** No difference in the average TAT of reports between laboratories

**Ha:** There is a difference in the average TAT of reports between laboratories

One way Anova test is performed as >2 sample present

Pvalue for Lab2 =0.166299

Pvalue for Lab3 =0.277335

Pvalue for Lab4 =0.215323

Pvalues are >0.05 so Ho is accepted (Null Hypothesis)

**Inference:** No difference in the average TAT of reports between laboratories

Doubts:

1. levene test for lab1 with lab3 not equal (pvalue<0.05 which indicates variance not equal)
2. when used below code for check pvalue then its <0.05

stats.f\_oneway(labtat.iloc[:,0], labtat.iloc[:,1],labtat.iloc[:,2],labtat.iloc[:,3])

pvalue=2.1156708949992414e-57

1. levene test necessary or just shapiro test and one way anova test is enough

Q. Sales of products in four different regions is tabulated for males and females. Find if male-female buyer rations are similar across regions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **East** | **West** | **North** | **South** |
| Males | 50 | 142 | 131 | 70 |
| Females | 550 | 351 | 480 | 350 |

Minitab File: **Buyer Ratio.mtw**

**Ans: Ho:** the proportions of male and female are same in all regions

**Ha:** the proportions of male and female are different in all regions

Chi-square test is performed as>2 proportions

Pvalue=1.0

As pvalue>0.05, Ho is accepted

**Inference:** the proportions of male and female are same in all regions

Q. TeleCall uses 4 centers around the globe to process customer order forms. They audit a certain % of the customer order forms. Any error in order form renders it defective and has to be reworked before processing. The manager wants to check whether the defective % varies by centre. Please analyze the data at *5%* significance level and help the manager draw appropriate inferences

Minitab File: **CustomerOrderForm.mtw**

**Ans: Ho:** the defective % across 4 centers are equal

**Ha:** the defective % across 4 centers varies

Chi-square test is performed as>2 proportions

Pvalue=0.6845505149379718

As pvalue>0.05, Ho is accepted

**Inference:** the defective % across 4 centers are equal

Q. Fantaloons Sales managers commented that *%* of males versus females walking in to the store differ based on day of the week. Analyze the data and determine whether there is evidence at *5 %* significance level to support this hypothesis.

Minitab File: **Fantaloons.mtw**

**Ans: Ho:** No difference in % of males and females walking in to the store differ based on day of the week

**Ha:** There is a difference in % of males and females walking in to the store differ based on day of the week

Two proportion test is performed as two different sample is present :

As pvalue<0.05, Ha is accepted

**Inference:** There is a difference in % of males and females walking in to the store differ based on day of the week