**HYPOTHESIS TESTING**

**Q1 :**

**BUSINESS OBJECTIVE :** A F&B manager wants to determine whether there is any

significant difference in the diameter of the cutlet between two units.

* So our data is having 2discrete x var and y is continuous
* Hence, We check for normality test. Our Ho: The data is normal , H1: Data is not normal.
* Since the p values are greater than 0.05 we accept H0 and say that our data is normal.
* The external condition is not same
* So, The next test is varianance test , our H0: The variances are equal , H1: the variances are not equal . So after conducting var test the p value is >0.05 so we fail to reject H0 hence we accept H0 saying that the variances are equal
* So our variances are equal and the external conditions are different . We proceed with the 2 sample T-test for equal variances.
* So our H0: The cutlet size has different between the 2 units. H1: there is no significance change in our diameter size. Since both the t values are >0.05 we accept Ho and reject H1.

**Verdict :** so We can say that there is no significance value in the diameter in in the sample of cutlets .

**Q2 :**

**BUSINESS OBJECTIVE :** To determine whether there is any difference in the average Turn Around Time (TAT) of reports of the laboratories on their preferred list

* In the data set we have y as continuous and x is discrete and we have more than 2 population with each other . So we have to perform Anova test in this condition
* So for normality test H0:The data is normal ,H1: The data is not normal . Hence our p values are greater than 0.05 .We can accept H0 and say that data is normally distributed.The next test would be variance test.
* In our variance test our H0: The data is having same variance ,H1: Atleast one is different variance. Since our variances are equal we accept H0 and say that variances are equal . the next test is oneway-anova test.
* As the p value is 2.1453e-58 <0.05 , So p low H0 go, So we are rejecting H0

**Verdict** :we can conclude that yes there is difference in the average Turn Around Time (TAT) of reports of the laboratories on their preferred list

**Q3 :**

**BUSINESS OBJECTIVE:** Find if male-female buyer rations are similar across regions

* Here our X,Y both are discrete and we compare more than 2 populations with each other . So we proceed further with Chi-square test.
* So we have to change that data set to a pivot table then perform table on the columns and then proceed with Chi-square test
* So our H0: Buyers ratio are similar,H1:Buyers ratio are not similar . After performing the chi-square test the value is >0.05 .So we accept Ho.

**Verdict** : We can conclude that male-female buyer ratio are similar across regions.

**Q4 :**

**BUSINESS OBJECTIVE:** The manager wants to check whether the defective % varies by center

* Here also our X,Y are discrete and we are comparing more than 2 population .So we have to proceed with the chi-square test.
* So our H0: The defective % varies by centre,H1: The defective % doesn’t varies by centre . So after the chi-square test the values is > 0.05 . So we accept the null hypothesis.

**Verdict**: Hence, We can say that yes the Defective % are varing for each country.

**Q5:**

**BUSINESS OBJECTIVE:** % of males versus females walking into the store differ based on day of the week.

* So here We have X,Y are discrete and we have only 2 population to compare .So we go with the 2-propotion test.
* We have created the table and performed the propotion test and H0=Male % and female% is same across all the days.H1: Male % and female% is not same across all the days.
* So our p value is less than 0.05 so we reject H0 and accept H1. So we perform greater test to check which type of gender is visiting the mall. So our H0:%Male \_> %Female , H1: %Male <\_ %Female. Since ,The p value is less than 0.05 here also we reject H0 and accept H1 .

**Verdict:** Hence we can conclude that the number of female % visting the mall in weekdays is greater than % Male visiting the mall according to our Hypothesis testing with considering the significance value to be 5%.