Case study 1:

Business problem: weather to know the significant difference in the diameter of the cutlet between unit A and B.

Data collection:

Y is continuous, x is discrete, Alpha =0.05.

Hypothesis test:

Ho: if the diameter of the cutlet is not increased no action is taken.

Ha: if the diameter of the cutlet is increased action to be taken.

Normality test:

Ho: data is normal no action is required.

Ha: data is not normal action is required.

P value is 0.287< 0.05 for unit A (p high null fly) we fail reject null hypo -thesis.

P value is 0.687>0.05 for unit B (p high null fly) we fail to reject null hypo-thesis.

So data is normal distributed.

Variance test:

Ho:  Variance of Unit A is equal to the variance of diameters of Unit B.

Ha:  Variance of Unit B is equal to the variance of diameters of Unit A.

P value is 0.297>0.05 p high null fly.

Conclusion: There is no significant difference in the diameters of unit A and unit B.

Case study 2:

Business problem: Hospital wants to determine weather is there any difference in average TAT among the different laboratories.

Data collection:

Input is discrete because the lab has more than 2 categories.

Y1= Lab1.

Y2= Lab2.

Y3=Lab3.

Y4=Lab4,

X is discrete, Alpha =0.05.

Hypothesis test:

Ho: if there is not any difference in average no action is taken.

Ha: if there is a difference in average action to be taken.

Normality test:

Ho: data is normal no action is required.

Ha: data is not normal action is required.

P value is 0.532> 0.05 for Lab1 (p high null fly) we fail reject null hypo -thesis.

P value is 0.733>0.05 for Lab2 (p high null fly) we fail to reject null hypo-thesis.

P value is 0.577>0.05 for Lab3 (p high null fly) we fail to reject null hypo-thesis.

P value is 0.419>0.05 for Lab4 (p high null fly) we fail to reject null hypo-thesis.

So that data is normal distributed.

Variance test:

Ho:  Variance of TAT of LAB 1 is equal to the variance of TAT of LAB 2.

Ha:  Variance of TAT of LAB2 is NOT equal to the variance of TAT of LAB1.

P value is 0.188>0.05 p high null fly.

Ho:  Variance of TAT of LAB 2 is equal to the variance of TAT of LAB 3.

Ha:  Variance of TAT of LAB 3 is NOT equal to the variance of TAT of LAB2.

P value is 0.237>0.05 p high null fly.

Ho:  Variance of TAT of LAB 3 is equal to the variance of TAT of LAB 4.

Ha:  Variance of TAT of LAB 4 is NOT equal to the variance of TAT of LAB 3.

P value is 0.307>0.05 p high null fly.

Ho:  Variance of TAT of LAB 4 is equal to the variance of TAT of LAB 1.

Ha:  Variance of TAT of LAB 1 is NOT equal to the variance of TAT of LAB 4.

P value is 0.189>0.05 p high null fly.

ANOVA:

Similarly by doing for different lab combinations you can see that P -value is 0766>0.05.

Conclusion: There is no significant difference between the average of TAT among the different laboratories.

Case study 3:

Business problem: Sales of products in four different regions of male and female buyer rations are similar across regions or not.

Data collection:

The given data is discrete and as more than 2 categories.

Hypothesis test:

Ho= Proportions of Male and Female are same no action to be taken.

Ha= Proportions of Male and Female are not same then action to be taken.

Chi square test:

If we have more than 2 categories then we can go with chi square test.

P-value is 0.674 >0.05.

P- High null fly.

Conclusion: The male and female proportions are same across regions.

Case study 4: the manger wants check any error in order form renders it is defective has to be worked before processing or not.

Data collection:

Inputs: y1, y2, y3, y4 are four in discrete in nature.

Outputs: continues.

Alpha =0.05.

Hypothesis test:

Ho= weather there is any error in order form no action to be taken.

Ha= weather there is any error in order form action to be taken.

2 proportion T test:

If we have more than 2 categories then we can go with 2 proportion t test.

P-value is 0.592>0.05. For Philippines & Indonesia.

P-value is 0.107>0.05. For Malta & India.

P- High null fly.

Conclusion: There is no any error in order form for significance level.

Case study 5: The sales manger want know whether males and females walking to store differ based on the day of the week.

Data collection:

Input: 2 discrete variables in nature.

Output: find the proportion of male and females on particular day or not.

Alpha: 5% significance.

Hypothesis test:

Ho= weather the males and females are walking on the particular day or not, no action to be taken.

Ha= weather the males and females are walking on the particular day action to be taken.

2 proportion T test:

Y is discrete and x is discrete in 2 categories in nature then we have to go 2 proportion test.

P value < 0.05 we have reject null hypothesis.

Case 1:

We have to find whose proportion is high in males or females.

We have to find one more hypothesis.

Ho= proportion of males is less than are equal to female.

Ha= proportion of males is greater than female.

2 proportion test:  
P-value <0.05 and hence we reject null.**Hence proportion of Male is greater than females.**