IT350 : Data Analytics
Lab Assignment 2

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Left tailed Z-test

Null hypothesis: Average salary of employee in mining department mean =59414.98628801679

Alternate hypothesis: Mean is lesser than 59414.98628801679.

Significance level : 0.05

Standard deviation of sample: 2.032991062450859

From the left-tailed z table
Critical value at 0.05 = 2.03+ 0.3531= 2.3831

z-score

Sample mean:49829..13475649047

Population mean: 59414.98628801679

Population standard deviation: 15.295550320130654

Sample size:76

Z-score: 2.42335325907871

Result: Since z-score is greater than the critical value, the null hypothesis can be rejected.

Right tailed Z-test

Null hypothesis: Average salary of employee in mining department mean = 59414.98628801679

Alternate hypothesis: covid deaths mean is greater than 59414.98628801679

Significance level : 0.05

Standard deviation of sample: 2.032991062450859

z score from the right-tailed z table
Critical value at 0.05 =2.03+.4801= 2.5101

Z-score

Sample mean:49829..13475649047

Population mean: 59414.98628801679

Population standard deviation: 15.295550320130654

Sample size:76

Z-score: 2.42335325907871

Result: Since z-score is less than the critical value, the null hypothesis can't be rejected.

Two tailed Z-test

Null hypothesis: Average salary of employee in mining department mean=59414.98628801679

Alternate hypothesis: mean ≠ 59414.98628801679

Significance level : 0.05

Standard deviation of sample: 2.032991062450859

Critical value at 0.05 = 2.032991062450859+ 0.3461 =2.379091062450859

z-score

Sample mean:49829..13475649047

Population mean: 59414.98628801679

Population standard deviation: 15.295550320130654

Sample size:76

Z-score: 2.42335325907871

Result : Since z-score is greater than critical value, the null hypothesis is rejected. Therefore, mean is not equal to 59414.98628801679

Z-test : Two sample

Null hypothesis: Average salary of employee in mining department mean= Average salary of employee in electrical department mean

Alternate hypothesis:Average salary of employee in mining department mean ≠ Average salary of employee in electrical department mean

We need to apply the two-tailed test.

Significance level : 0.05

Standard deviation of employee in mining department 2.032991062450859

Standard deviation of employee in electrical department: 2.3385788593429044

Critical value at 0.05 for mining department = 2.03 + 0.3461 = 2.3761

Critical value at 0.05 for excess for electrical department = 2.33+0.4898 = 2.8198

Z-score: 138.3830017777252

Result: Since z-score is greater than critical value, the null hypothesis is rejected. Therefore, both the samples do not have equal mean.

T-test

Null hypothesis: There is no difference in salary of employee in

electrical department and employee in agriculture department

Alternate hypothesis: Salary of employee in electrical department is

greater than employee in agriculture department

We need to apply right-tailed test

Significance level : 0.05

Degrees of freedom: 565+561-2=1124

From the right-tailed t table
Critical value at 0.05 =2.576

T-score
Mean of salary of employee in electrical department sample: 59414.98628801679
Mean of salary of employee in agriculture department sample: 41662.95264623956
Mean of salary of electrical department sample: 97704.78983382209
Mean of salary of agriculture department sample: 80603.71456500488
Standard deviation of salary of electrical departments: 78.73732097328938
Standard deviation of salary of agriculture department sample: 158.73732097328938
Sample size of electrical department:565
Sample size of agriculture department::561

T-score: 93.85796557225905

Result : Since t-score is greater than the critical value, the null hypothesis can be rejected.

F-test

1)Chi square test

Null hypothesis: Number of employee in mining department and Number of employee in agriculture department are independent

Alternate hypothesis: Number of employee in mining department and Number of employee in agriculture department are dependent

Significance level : 0.05

Degrees of freedom: 1

From the right-tailed f table
Critical value at 0.05 = 3.841

chi-square value

	Total
mining department	**667**
agriculture department	**735**
Total	**1402**

Chi-square-score: 0

Result : Since chi-square value is less than the critical value, the null hypothesis cannot be rejected. Number of employee in mining department and Number of employee in agriculture department are independent

2)ANOVA test

Groups:

Salary of employee in BD CQ.SEA1AA
Salary of employee in BD CQ.SEA2BA
Salary of employee in BD CQ.SEA3BA

Null hypothesis: There is no variance between the means of the different groups

Alternate hypothesis: Means are not equal

Significance level : 0.05

Degrees of freedom

K = 3
N = 7565

Df1 = 3
Df2 = 7562

Critical value at chosen significance level using degrees of freedom df1 and df2

From the ANOVA f table
Critical value at 0.05 = 2.696

F value

F-score: 11.50506413762189

Result: Since F-score value is greater than the critical value, the null hypothesis can be rejected.