

1. Using R execute the basic commands, array, list and frames.
2. Create a Matrix using R and perform the operations addition, inverse, transpose and multiplication operations.
3. Using R Execute the statistical functions: mean, median, mode, quartiles, range, inter quartile range histogram
4. Using R import the data from Excel / .CSV file and Perform the above functions
5. Using R import the data from Excel / .CSV file and Calculate the standard deviation, variance, co-variance.
6. Using R import the data from Excel / .CSV file and draw the skewness
7. Import the data from Excel / .CSV and perform the hypothetical testing.
8. Import the data from Excel / .CSV and perform the Chi-squared Test
9. Using R perform the binomial and normal distribution on the data.
10. Perform the Linear Regression using R.
11. Compute the Least squares means using R.
12. Compute the Linear Least Square Regression.

1. Write a program in R to execute the basic commands, array, list and frames.
2. Write a program in R to create two matrices A and B of order 3 X 3 and perform the following operations:
  - a) Add matrices A and B
  - b) Multiply matrices A and B
  - c) Find the inverse of matrix A
  - d) Find the inverse of matrix B
  - e) Find the transpose of matrix B
3. A random sample of 33 individuals who listen to talk radio was selected and the hours per week that each listens to talk radio was determined. The data are as follows.  
9 8 7 4 8 6 8 8 7 10 8 10 6 7 7 8 9 6 5 8 5 6 8 7 8 5 5 8 7 6 6 4 5  
Test the null hypothesis using R that  $\mu = 5$  hours (h) versus the alternative hypothesis that  $\mu \neq 5$  at level of significance  $\alpha = 0.05$  in the following three equivalent ways:
  - (a) Compute the value of the test statistic and compare it with the critical value for  $\alpha = 0.05$
  - (b) Compute the p-value corresponding to the computed test statistic and compare the p-value with  $\alpha = 0.05$ .
  - (c) Compute the  $1 - \alpha = 0.95$  confidence interval for  $\mu$  and determine whether 5 falls in this interval.
4. A car travels 25 miles at 25 miles per hour (mi/h), 25 miles at 50 mph, and 25 miles at 75 mph. Write a program to find the arithmetic mean of the three velocities and the harmonic mean of the three velocities. Which is correct?
5. Enter the following details of wages of 65 employees at the ABC Ltd. In Excel

Wages	Number of Employees
25000-25999	8
26000-26999	10
27000-27999	16
28000-28999	14
29000-29999	10
30000-30999	5
31000-31999	2
Total	65

6. Enter the following table of three distributions f1, f2 and f3 for the variable X in EXCEL.

X	f1	f2	f3
0	10	1	1
1	5	2	2
2	2	14	2
3	2	2	5
4	1	1	10

Import the data in R and write a program to find Pearson's first and second coefficients of skewness.

7. Suppose the number of games in which major league baseball players play during their careers is normally distributed with mean equal to 1500 games and standard deviation equal to 350 games. Use R to solve the following problems.

- (a) What percentage play in fewer than 750 games?
- (b) What percentage play in more than 2000 games?
- (c) Find the 90th percentile for the number of games played during a career.

8. The time spent watching TV per week by middle-school students has a normal distribution with mean 20.5 hours and standard deviation 5.5 hours. Use R to find the percent who watch less than 25 hours per week. Use R to find the percent who watch over 30 hours per week. Sketch a curve representing these two groups using R or Excel.

9. Enter the following data sets in Excel:

- a) 12, 6, 7, 3, 15, 10, 18, 5
- b) 9, 3, 8, 8, 9, 8, 9, 18.

Import the data in R and find standard deviation and variance of the data sets using R.

10. Enter the following table which shows the heights (H) to the nearest inch (in) and the weights(W) to the nearest pound (lb) of a sample of 12 male students drawn at random from the first-year students at College.

H	70	63	72	60	66	70	74	65	62	67	65	68
W	155	150	180	135	156	168	178	160	132	145	139	152

Import the data in R and write a program to fit a least squares line using

- a) H as the independent variable
- b) H as dependent variable

**PROGRAMME: S.Y.I.T. (SEM-IV)**

**COURSE: COMPUTER ORIENTED STATISTICAL TECHNIQUES PRCATICAL**

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11. Enter the total agricultural exports in millions of dollars in Excel:

Year	2000	2001	2002	2003	2004	2005
Total Value	51246	53659	53115	59364	61383	62958

Import the data in R and perform the following

- A. Graph the data and show the least-squares regression line.
- B. Find and plot the trend line for the data.
- C. Estimate the value of total agricultural exports in the year 2006.

12. Many casinos use card-dealing machines to deal cards at random. Occasionally, the machine is tested to ensure an equal likelihood of dealing for each suit. To conduct the test, 1,500 cards are dealt from the machine, while the number of cards in each suit is counted. Theoretically, 375 cards should be dealt from each suit. But this is not the case as shown in the following table:

	Spade	Diamond	Club	Heart
Observed	402	358	273	467
Expected	375	375	375	375

Enter the data in Excel. Import the data in R and write a program using chi-square test to determine if the discrepancies are significant. If the discrepancies are significant, then the game would not be fair.

13. Business owner had been working to improve employee relations in his company. He predicted that he met his goal of increasing employee satisfaction from 65% to 80%. Employees from four departments were asked if they were satisfied with the working conditions of the company. The results are shown in the following table:

	Finance	Sales	HR	Technology
Satisfied	12	38	5	8
Dissatisfied	7	19	3	1
Total	19	57	8	9

Enter the data in Excel. Import the data from Excel to R and write a program using chi-square test to determine whether the results support or reject the business owner's prediction.

14. Enter the total agricultural exports in millions of dollars in Excel:

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Total Value	51246	53659	53115	59364	61383	62958

Import the data in R and perform the following

- a. Graph the data and show the least-squares regression line.
- b. Find and plot the trend line for the data.
- c. Estimate the value of total agricultural exports in the year 2006.