

101009/ IT222U R Programming
Batch 2021-25
LAB CYCLE

EXPERIMENT 1

• **Basic programming experiments – Control Flow, Loop, Functions, Vectors**

Develop an R program to

1. Create an empty vector and append values.
2. Create three vectors numeric data, character data, and logical data. Display the content of the vectors and their type.
3. Create three vectors a, b, and c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix.
4. Find the maximum and the minimum value of a given vector.
5. Get the first 10 Fibonacci numbers
6. Get all prime numbers up to a given number using functions.
7. Find the factors of a given number using functions.
8. Compute the sum, mean, and product of given vector elements.
9. Add and Subtract Days to and from Date.
10. Calculate the number of days between two dates.

EXPERIMENT 2

• **Array, Matrices**

Develop an R program to

1. Create an array called threed with three dimensions with 3 elements in the first, 2 in the second, and 2 in the third. Name your first dimension as "Stock Price", "Revenue", "Employees", the second as "2018", "2019" and the third as "Apple", "Microsoft". Feed the array with the following data:
(155, 261, 132000, 423.4, 321, 137000, 105, 240, 118000, 157.64, 260, 139000)
2. Using array indexes, compute the difference between Apple's stock price in 2019 and 2018. Store it in an object called diff_price. Based on the diff_price object, compute the percentage difference (in decimal format, where for instance: 0.5 equals to 50%) between Apple's stock price in 2019 and 2018. Use array indexes again to find the 2018 Apple stock price in the three arrays.
3. Create a two-dimensional 5×3 array of a sequence of even integers greater than 50.
4. Create 5 × 4 matrices, 3 × 3 matrices with labels and fill the matrix by rows, and 2 × 2 matrices with labels and fill the matrix with columns.
5. Transpose the matrix and save it in an object.
6. Use matrix multiplication properties to compute the multiplication of 2 matrices and save it in an object called matrix_mul. Hint: Remember the %*% operator.

EXPERIMENT 3

- **List, Data frame, and Data manipulation**

Develop an R program to

1. Reverse a given list in R.
2. Given a list of numbers. Turn every item on a list into its square.
3. Select the second element of a given nested list.
4. Merge two given lists into one list.
5. Convert a given list to a vector.
6. Create a Data frame that contains details of 5 employees and displays a summary of the data.
7. Get the statistical summary and nature of the data of a given data frame.
8. Extract 3rd and 5th rows with 1st and 3rd columns from a given data frame.
9. Add new row(s) to an existing data frame.
10. sort a given data frame by multiple column(s).
11. Read the given CSV file, Find the Max salary, Get the details of the person with the max salary, get all the people working in the IT department, get the people who joined on or after 2014, and Write into an Output.CSV File.

EXPERIMENT 4

- **Graphics in R**

Develop an R program to

1. Create a Scatter plot with the iris dataset using the ggplot package. Add legends, lines, and labels, and use the aes function in the plot.
2. Choose a dataset of your choice and plot a Histogram for the same.
3. Choose a dataset of your choice and plot a Box plot for the same.
4. Choose a dataset of your choice and plot a Bar Graph for the same.

EXPERIMENT 5

- **Linear Model**

Develop an R program to

1. Perform the simple linear regression analysis for the given data set.
2. Perform the multiple linear regression analysis for the given data set.