R for Data Science Assignment 3

Faculty: Dr. Nachiket Tapas
Branch: CSE (AI)/ CSE (DS)

1. Write an R script to create a logical vector of length 12 that alternates between TRUE and FALSE.

2. Write a R script that takes a numeric vector as input and returns a logical vector indicating which elements are negative.

3. Given two numeric vectors of equal length, write R code to check if they are element-wise equal and then output the indices where they differ using the which() function.

4. Create a 3×4 matrix from a given logical vector and display the result. Then, create another 3×4 numeric matrix and perform an element-wise comparison between them.

5. Demonstrate vector recycling by creating one vector of length 4 and another of length 10, then perform an addition operation. Print the resulting vector.

6. Write R code that calculates the sum of all TRUE values in a given logical vector (using their numeric property where TRUE = 1 and FALSE = 0).

7. Given a numeric vector, write R code to extract all elements that are greater than 10 using logical subsetting.

8. For the string "Hello World! Welcome to R programming", write R code to count the number of characters (using nchar()) and extract the substring "R programming".

9. Write R code that concatenates the strings "Data", "Science", and "R" into a single string with hyphens (-) as separators.

10. Write an R script that demonstrates the difference between cat() and paste() by printing the same set of words using both functions with a custom separator.

11. Given the string "apple, apple, and apple", write R code that uses sub() to replace only the first occurrence of "apple" with "orange", and gsub() to replace all occurrences.

12. Convert the character vector c("male", "female", "male", "female") into a factor. Display the factor and its levels.

13. Create a factor from the vector c("Jan", "Mar", "Feb", "Apr", "May", "Dec", "Nov") and order the factor to reflect the natural calendar order (January to December). Display the ordered factor.

14. Given a factor vector of genders (e.g., gender <- factor(c("male", "female", "female", "male", "female"))), write R code to extract only the entries corresponding to "female".

15. Write a function that takes a numeric vector and bins the data into three categories: "Low", "Medium", and "High". Use the cut() function and return the resulting factor.

16. Create a logical vector and demonstrate the use of the any() and all() functions. Explain, via comments, a scenario where any() returns TRUE but all() returns FALSE.

17. Given two logical vectors, write R code to perform element-wise logical AND, OR, and NOT operations. Print the results.

18. Given a numeric vector, write R code to create a new vector where all values less than the mean of the vector are replaced with NA.

19. Write an R script to compare two strings alphabetically using relational operators. Explain via comments how R determines the order (considering case sensitivity).

20. Write an R script that creates a string containing a newline, tab, and a backslash using escape sequences. Print the string to the console using cat().

*****Finished*****