# Challenge-5

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**Welcome!** Hope you have watched the lecture videos and followed the instructions in code-along. Go through the steps described below, *carefully*. It is totally fine to get stuck - **ASK FOR HELP**; reach out to your friends, TAs, or the discussion forum on Canvas.

Here is what you have to do,

- 1. Pair with a neighbor and work
- 2. **Download** the Challenge-5.pdf and Challenge-5.Rmd from Canvas
- 3. Move the downloaded files to the folder, "Week-5" that you created previously
- 4. **Set** it as the working directory
- 5. Edit content in Challenge-5.Rmd wherever indicated following instructions in Challenge-5.pdf
- 6. Remember to set eval=TRUE in the code chunk to generate the output
- 7. Ensure that echo=TRUE so that the code is rendered in the final document
- 8. Code output may not be required in all cases, use your discretion
- 9. **Inform** the tutor/instructor upon completion
- 10. Submit the document on Canvas after they approve
- 11. Attendance will be marked only after submission
- 12. Once again, do not hesitate to reach out to the tutors/instructor, if you are stuck

# **Questions**

#### Question-1: Local Variable Shadowing

Create an R function that defines a global variable called x with a value of 5. Inside the function, declare a local variable also named x with a value of 10. Print the value of x both inside and outside the function to demonstrate shadowing.

#### **Solutions:**

# Enter code here

### Question-2: Modify Global Variable

Create an R function that takes an argument and adds it to a global variable called total. Call the function multiple times with different arguments to accumulate the values in total.

#### Solutions:

# Enter code here

#### Question-3: Global and Local Interaction

Write an R program that includes a global variable total with an initial value of 100. Create a function that takes an argument, adds it to total, and returns the updated total. Demonstrate how this function interacts with the global variable.

#### Solutions:

# Enter code here

#### **Question-4: Nested Functions**

Define a function outer\_function that declares a local variable x with a value of 5. Inside outer\_function, define another function inner\_function that prints the value of x. Call both functions to show how the inner function accesses the variable from the outer function's scope.

#### Solutions:

# Enter code here

#### Question-5: Meme Generator Function

Create a function that takes a text input and generates a humorous meme with the text overlaid on an image of your choice. You can use the magick package for image manipulation. You can find more details about the commands offered by the package, with some examples of annotating images here: https://cran.r-project.org/web/packages/magick/vignettes/intro.html

#### Solutions:

# Enter code here

## Question-6: Text Analysis Game

Develop a text analysis game in which the user inputs a sentence, and the R function provides statistics like the number of words, characters, and average word length. Reward the user with a "communication skill level" based on their input.

#### **Solutions:**