Challenge-5

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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
x <- 5
local_variable <- function(x) {x <- 10}
print(x)
```

```
## [1] 5
```

```
print(local_variable(x))
```

```
## [1] 10
```

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
total <- 0
add_to_total <- function(x) {total <<- x+total
return(total)}
add_to_total(5)
```

```
## [1] 5
```

```
add_to_total(250)
```

```
## [1] 255
```

```
add_to_total(-63)
```

```
## [1] 192
```

```
add_to_total(9.742)
```

```
## [1] 201.742
```

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
total <- 100
add_to_total <- function(x) {total <<- x+total
return(total)}
add_to_total(25)
```

```
## [1] 125
```

```
add_to_total(75)
```

```
## [1] 200
```

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
outer_function <- function(x) {x=5
inner_function <- function(x) {print(x)}
inner_function(x)
}
outer_function(x)
```

```
## [1] 5
```

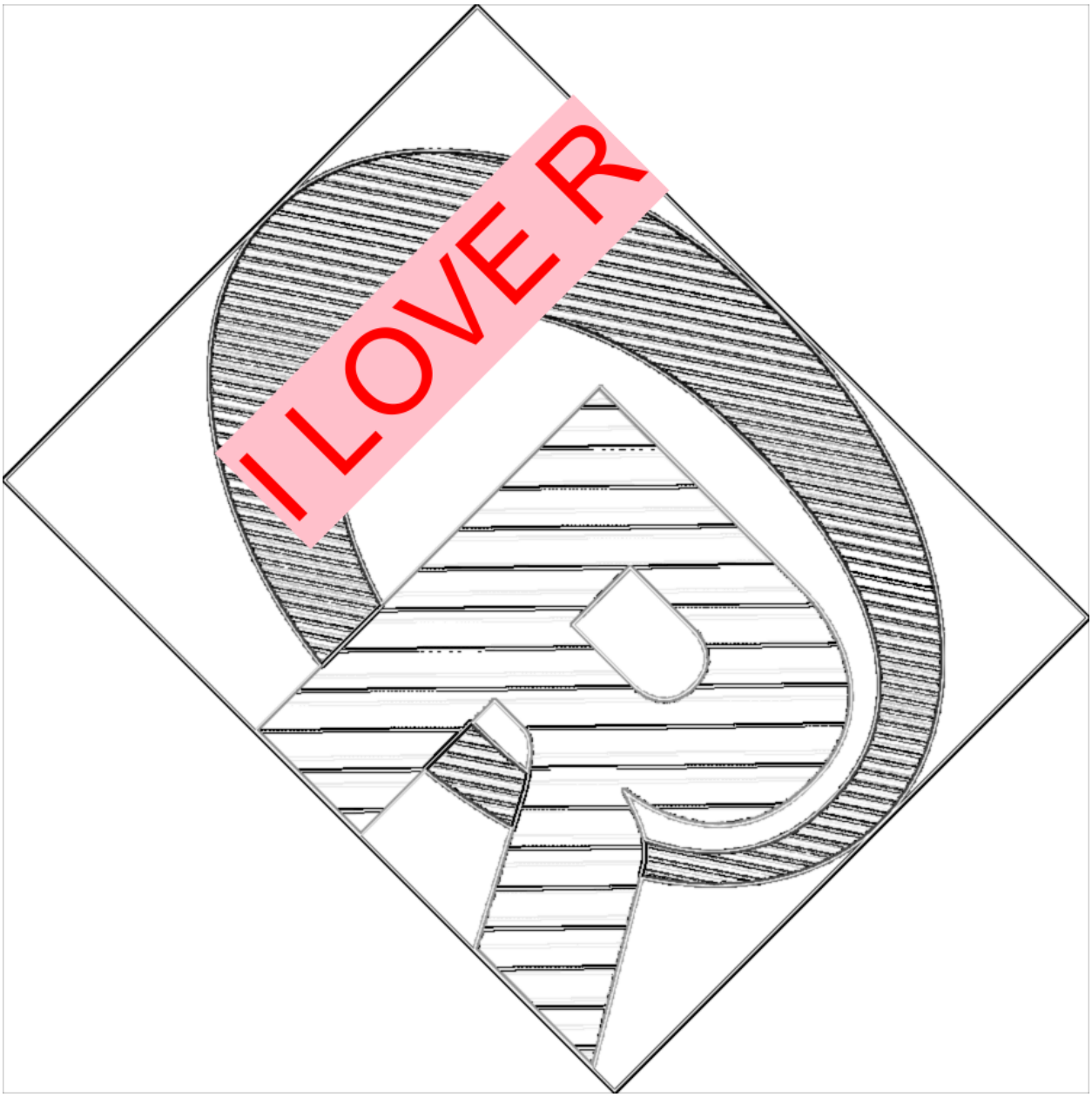
Question-5: Meme Generator Function Create a function that takes a text input and generates a humorous meme with the text overlaid on an image of your choice. You can use the `magick` package for image manipulation. You can find more details about the commands offered by the package, with some examples of annotating images here: https://cran.r-project.org/web/packages/magick/vignettes/intro.html

Solutions:

```
# Enter code here
library(magick)
```

```
## Linking to ImageMagick 6.9.12.93
## Enabled features: cairo, fontconfig, freetype, heic, lcms, pango, raw, rsvg, webp
## Disabled features: fftw, ghostscript, x11
```

```
R_icon <- image_read("R Icon.png")
R_icon_slanted <- image_rotate(R_icon,45)
R_icon_slanted_charcoal <- image_charcoal(R_icon_slanted)
image_annotate(R_icon_slanted_charcoal, "I LOVE R", size = 100, boxcolor = "pink", color = "red", degre
```



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:

```
# Enter code here
sentence <- "James loves NM2207 very much"
text_analysis_game <- function(sentence) {
  number_of_words <- lengths(strsplit(sentence," "))
  number_of_characters <- nchar(gsub(" ","",sentence))
  average_word_length <- number_of_characters/number_of_words
  communication_skill_level <- ifelse(average_word_length<1, "B",
        ifelse(average_word_length<2, "B+",
        ifelse(average_word_length<3, "A-",
        ifelse(average_word_length<4, "A", "A+"))))
  cat("Your sentence has ", number_of_words, " words, ", number_of_characters, " characters and an avera
}
text_analysis_game(sentence)
```

```
## Your sentence has  5  words,  24  characters and an average word length of  4.8 .
##  You have attained a communication skill level of  A+
```