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:

```r
# Enter code here
variable_x <- function(){
  x<-10
  print(paste("inside function:",x))
}
x<-5
print(paste("before shadowing:", x))
```

```
## [1] "before shadowing: 5"
```

```r
variable_x()
```

```
## [1] "inside function: 10"
```

```r
print(paste("after shadowing:",x))
```

```
## [1] "after shadowing: 5"
```

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:

```r
# Enter code here
add_to_total <-function(value){
  total <<- total + value
}
total<-0
add_to_total(3)
add_to_total(6)
add_to_total(19)
print(total)
```

```
## [1] 28
```

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:

```r
# Enter code here
total <- 100
add_100 <- function(number){
  total <- total+number
  return(total)
}
print(add_100(60))
```

```
## [1] 160
```

```r
print(add_100(70))
```

```
## [1] 170
```

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:

```r
# Enter code here
outer_function <- function(){
  x<-5
  inner_function <- function(){
    print(paste("Value of x from inner_function:",x))
  }
  inner_function()
  print(paste("Value of x from outer_function:",x))
}
outer_function()
```

```
## [1] "Value of x from inner_function: 5"
## [1] "Value of x from outer_function: 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:

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

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

```
generate_meme <- function(text, output_path) {
  image_path <- "C:/Users/angel/Downloads/crying meme.jpg"
  meme <- image_read(image_path)
  meme <- image_annotate(
    meme,
    text = text,
    color = "red",
    size = 40,
    location = "+10+10",
    font = "Comic Sans"
    )
  image_write(meme, path = output_path)
  print(paste("Meme generated and saved to:", output_path))
  }
text_to_overlay <- "When you need to code for 2207..."
output_image_path <- "output_meme.jpg"
generate_meme(text_to_overlay, output_image_path)
```

```
## [1] "Meme generated and saved to: output_meme.jpg"
```

```
knitr::include_graphics("C:/Users/angel/OneDrive/Documents/NM2207/WEEK 5/output_meme.jpg")
```


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:

```r
# Enter code here
text_analysis_game <- function(user_input) {
  number_of_characters <- nchar(user_input)
  words <- strsplit(user_input, "\\s+")
  number_of_words <- length(words[[1]])
  avg_word_length <- number_of_characters / number_of_words

  result <- list(
    number_of_characters = number_of_characters,
    number_of_words = number_of_words,
    avg_word_length = avg_word_length
  )

  skill_level <- "Beginner"
  if (avg_word_length > 5) {
    skill_level <- "Intermediate"
  }
  if (avg_word_length > 10) {
    skill_level <- "Advanced"
  }

  result$skill_level <- skill_level

  return(result)
}

user_input <- "Yingzhe cant do this coding thing anymore CRIES"
result <- text_analysis_game(user_input)

cat("Statistics for your sentence:\n")
```

Statistics for your sentence:

```r
cat(paste("Number of characters:", result$number_of_characters), "\n")
```

Number of characters: 47

```r
cat(paste("Number of words:", result$number_of_words), "\n")
```

Number of words: 8

```r
cat(paste("Average word length:", round(result$avg_word_length, 2), "characters"), "\n")
```

Average word length: 5.88 characters

```r
cat(paste("Communication Skill Level:", result$skill_level), "\n")
```

Communication Skill Level: Intermediate

```
```