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

func <- function(){
  x = 10
  return(x)
}

x
```

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

```
func()
```

```
## [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

func <- function(arg){
  total <<- total + arg
}

func(10)
func(5)
total
```

```
## [1] 15
```

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

func <- function(arg){
  total <<- total + arg
  return(total)
}

func(20)
```

```
## [1] 120
```

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 <- 5
  inner_function <- function(){
    print(x)
  }
  inner_function()
}

outer_function()
```

```
## [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 (https://cran.r-project.org/web/packages/magick/vignettes/intro.html)

Solutions:

```
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
```

```
tiger <- image_read_svg('http://jeroen.github.io/images/tiger.svg', width = 350)

# Enter code here
meme <- function(text_input){
  image_annotate(tiger,text_input,size = 60, gravity = "southwest", color = "green")
}
meme("IM HUNGRY")
```

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
game <- function(){
  read <- readline(prompt = "Please enter a sentence: ")
  words <- length(strsplit(read, "\\s+")[[1]])
  chars <- nchar(read)
  av <- chars/words

  cat(" words:",words,"\n","characters:",chars,"\n","average word length:",av,"\n")

  if (av > 8){
    cat("Your communication skill level: EXCELLENT! ")
  } else if (av < 4){
    cat("Your communication skill level: meh :( ")
  } else {
    cat("Your communication skill level: not bad :D")
  }
}
game()
```