Challenge-5

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13/09/2023

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
foo <- function() {
 x <- 10
 return(x)
}
foo()
```

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

```
sprintf("The value assigned to x outside the function is %d",x)
```

```
## [1] "The value assigned to x outside the function is 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:

```
# Enter code here
total <- 0
add_to_total <- function(n) {
  total <<- total+n
}
add_to_total(5)
print(total)
```

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

```r
add_to_total(10)
print(total)
```

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

```r
add_to_total(13)
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_to_total <- function(value) {
  total <<- total + value
  return(total)
}

add_to_total(50)
```

```
## [1] 150
```

```r
sprintf("The final value of the global variable `total` is %d",total)
```

```
## [1] "The final value of the global variable ‘total‘ is 150"
```

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(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

Solutions:

```
# 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
```

```
create_meme <- function(image_path, text) {

  img <- image_read(image_path)

  text_color <- "black"
  text_size <- 40
  text_font <- "Impact"

  image_annotate(
    img,
    text,
    location = "+30+30",
    color = text_color,
    size = text_size,
    font = text_font
  )
}
image_path <-"Mocking-Spongebob.jpg"
text <- "Me when can't knit the file"
create_meme(image_path, text)
```

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() {

  cat("Welcome to the Text Analysis Game!\n")
  sentence <- readline("Enter a sentence: ")

  num_characters <- nchar(sentence)
  words <- strsplit(sentence, " ")[[1]]
  num_words <- length(words)
  avg_word_length <- sum(nchar(words)) / num_words

  if (is.na(avg_word_length)) {
    cat("There are no valid words in the sentence.\n")
    return()
  } else if (avg_word_length <= 4) {
    skill_level <- "Novice Communicator"
  } else if (avg_word_length <= 6) {
    skill_level <- "Intermediate Communicator"
  } else {
```

```
    skill_level <- "Advanced Communicator"
  }

  cat("\nText Statistics:\n")
  cat("Number of Characters:", num_characters, "\n")
  cat("Number of Words:", num_words, "\n")
  cat("Average Word Length:", avg_word_length, "\n")
  cat("\nCommunication Skill Level:", skill_level, "\n")
}
```