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

```
## [1] "The value assigned to z outside the function is 5"
```

```
foo<- function(x = 2) {
x <- 10
return(x)
}
foo()
```

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

```
sprintf("The final value of z after reassigning it to a different value inside the function i
s %d",x)
```

```
## [1] "The final value of z after reassigning it to a different value inside 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
addition_to_total<-function(n){
  total<<-total+n
}

addition_to_total(5)
addition_to_total(7)
addition_to_total(9)
print(total)
```

```
## [1] 21
```

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
added_to_total<-function(n){
  total<<-total+n
  return(total)
}
added_to_total(35)
```

```
## [1] 135
```

```
sprintf("The final value of total after reassigning it to a different value inside the functi
on is %d",total)
```

```
## [1] "The final value of total after reassigning it to a different value inside the functio
n is 135"
```

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:

```
# 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 <- "white"
  text_size <- 40
  text_font <- "comic sans"

  image_annotate(
    img,
    text,
    location = "+30+150",
    color = text_color,
    size = text_size,
    font = text_font
  )
}
image_path <-"help meme.png"
text <- "me running to my TA everytime
my code cant knit"
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:

```
# Enter code here
communication_skill_level<-function(ave_word_length){
  if (ave_word_length >= 12){
    return("pro")
  }else if(ave_word_length >=7){
    return("average")
  }else{
    return("poor")
  }
}
input_sentence<-function(){
  sentence<-readline("put sentence here ")
  num_of_chars<-nchar(sentence)
  words<-strsplit(sentence, split= " ")
  num_of_words<-lengths(words)
  ave_word_length<-sum(nchar(words))/num_of_words
  print(num_of_chars)
  print(num_of_words)
  print(ave_word_length)
  print(communication_skill_level(ave_word_length))
}
```