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
print(paste("Outside Function: ", x))
```

```
## [1] "Outside Function:  5"
```

```
local_x <- function() {
  x<-10
  print(paste("Inside Function:", x))
}
  local_x()
```

```
## [1] "Inside Function: 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_total <- function(x) {
  total<<- total +x

}
add_total(2)
print(total)
```

```
## [1] 2
```

```
add_total(4)
print(total)
```

```
## [1] 6
```

```
add_total(6)
print(total)
```

```
## [1] 12
```

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_total<- function(x){
  total<<-total + x

}
   print(add_total(10))
```

```
## [1] 110
```

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)
```

```
## Warning: package 'magick' was built under R version 4.2.3
```

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

```
input <- function(path, text) {
  giraffe <- image_read(path)
print(giraffe)
image_annotate(giraffe, print(paste0(text)), size = 49, gravity = "southwest", color = "gree
n")
}
input("C:/Users/Cheeting/OneDrive/Pictures/giraffe.jfif","i love grass")
```

```
##   format width height colorspace matte filesize density
## 1   JPEG   300    168       sRGB FALSE     5534   72x72
## [1] "i love grass"
```

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
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.2.3
```

```
## Warning: package 'ggplot2' was built under R version 4.2.3
```

```
## Warning: package 'tibble' was built under R version 4.2.3
```

```
## Warning: package 'tidyr' was built under R version 4.2.3
```

```
## Warning: package 'readr' was built under R version 4.2.3
```

```
## Warning: package 'purrr' was built under R version 4.2.2
```

```
## Warning: package 'dplyr' was built under R version 4.2.3
```

```
## Warning: package 'stringr' was built under R version 4.2.2
```

```
## Warning: package 'forcats' was built under R version 4.2.3
```

```
## Warning: package 'lubridate' was built under R version 4.2.3
```

```
## ── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──
## ✓ dplyr     1.1.2     ✓ readr     2.1.4
## ✓ forcats   1.0.0     ✓ stringr   1.5.0
## ✓ ggplot2   3.4.3     ✓ tibble    3.2.1
## ✓ lubridate 1.9.2     ✓ tidyr     1.3.0
## ✓ purrr     1.0.1
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
## ℹ Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to be
come errors
```

```
input <- function(sentence) {
  words <- strsplit(sentence, " ")[[1]]
  num_words<-length(words)
  number_character<- nchar(sentence)
  average_word_length <- number_character/num_words
  print(paste0("Number of words= ", num_words,
               " Number of characters= ", number_character,
               " Average word length= ", average_word_length
               ))
  ifelse (average_word_length >=5, print("Excellent"), print("Don't Give Up!"))

}
input("I love economics")
```

```
## [1] "Number of words= 3 Number of characters= 16 Average word length= 5.33333333333333"
## [1] "Excellent"
```

```
## [1] "Excellent"
```