Challenge-5

Yang Juan Hun (Violet)

2023-09-11

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
demo_shadow <- function(){
  x <<- 5
  x <- 10
  return(x)
}
demo_shadow()
```

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

```
x
```

```
## [1] 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(add) {
  total <<- total + add
  return(total)
}
add_to_total(1)
```

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

```
add_to_total(3)
```

```
## [1] 4
```

```r
add_to_total(3)
```

```
## [1] 7
```

```r
add_to_total(7)
```

```
## [1] 14
```

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(add){
  total <- total + add
  return(total)
}
add_to_total(5)
```

```
## [1] 105
```

```r
cat("The function used the global variable \"total\" within the function, even though it was not assign
```

```
## The function used the global variable "total" within the function, even though it was not assigned u
```

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
```

```r
inner_function()
```

```
## Error in inner_function(): could not find function "inner_function"
```

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)
```

```
## 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
```

```r
generate_skeletor_fact <- function(line_1, line_2 = " ", line_3 = " "){
  template <- image_read("https://memetemplates.in/uploads/1639598905.jpeg")
  meme <- image_annotate(template, line_1, size = 50, gravity = "northeast", color = "white", location =
  meme <- image_annotate(meme, line_2, size = 50, gravity = "northeast", color = "white", location = "+
  meme <- image_annotate(meme, line_3, size = 50, gravity = "northeast", color = "white", location = "+
  meme <- image_scale(meme, "700")
  print(meme)
}
generate_skeletor_fact("chatgpt is banned", "for the week 6 quiz","but bing chat AI isn't")
```

```
##   format width height colorspace matte filesize density
## 1   JPEG   700    715       sRGB  TRUE        0   96x96
```

chatgpt is banned for the week 6 quiz but bing chat AI isn't

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
analyse_text <- function(sentence) {
  split_strings <- strsplit(sentence, ' ')
  n_words <- lengths(split_strings)
  n_char <- nchar(sentence)
  avg_word_length <- mean(nchar(split_strings[[1]]))
  #high skill = able to says a lot without too many long words
  skill_level <- n_char/avg_word_length
  return(list("Word count"=n_words,
              "Character count"=n_char,
              "Average word length"=avg_word_length,
              "Skill level"=skill_level))
}
analyse_text("hello world")
```

```
## $‘Word count‘
## [1] 2
##
## $‘Character count‘
## [1] 11
##
## $‘Average word length‘
## [1] 5
##
## $‘Skill level‘
## [1] 2.2
```