

Challenge-5

Insert your name here

2023-09-16

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
```

```
function1 <- function(x = 10) {  
  return(x)  
}
```

```
print(x)
```

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

```
function1()
```

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

```
#see submitted challenge for clearer ans ig, but correct! :)
```

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 <- 5
```

```
function_2 <- function(x) {  
  total <-- total + x  
}
```

```
print(function_2(5))
```

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

```
print(function_2(6))
```

```
## [1] 16
```

In R, `<-` is an assignment operator used to assign a value to a variable in an environment that is outside the current function's environment.

```
# note <- operator
```

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
```

```
function3 = function(x) {  
  total <- x + total  
  return(total)  
}
```

```
function3(5)
```

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

```
function3(6)
```

```
## [1] 111
```

```
print(total)
```

```
## [1] 111
```

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(x)
```

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

```
# outer_function doesn't actually call inner_function or  
# execute any code that would print the value of x -> need call inner_function within outer_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:

```
# Enter code here  
# see submitted challenge
```

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  
# see submitted challenge
```