Project- Basic Questions

2024-04-08

#1. Create a vector called stock.prices  
stock.prices <- c(23, 27, 23, 21, 34)  
print(stock.prices)

## [1] 23 27 23 21 34

#2. Create a numeric vector containing the numbers 1 to 10  
numeric\_vector <- 1:10  
numeric\_vector

## [1] 1 2 3 4 5 6 7 8 9 10

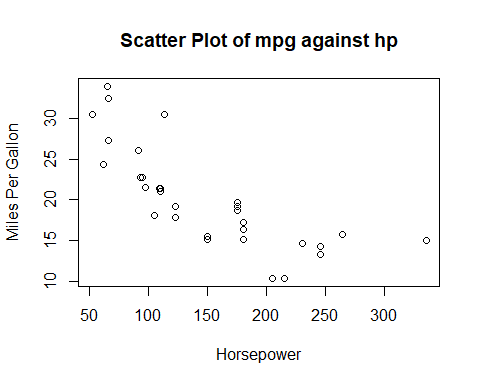
#3. Calculate the sum of the numbers  
sum\_of\_numbers <- sum(numeric\_vector)  
sum\_of\_numbers

## [1] 55

#4. Create a logical vector indicating which numbers are even  
even\_vector <- numeric\_vector %% 2 == 0  
even\_vector

## [1] FALSE TRUE FALSE TRUE FALSE TRUE FALSE TRUE FALSE TRUE

#5. Use the plot() function to create a scatter plot of the mtcars dataset, plotting mpg against hp:  
#Load the mtcars dataset  
data(mtcars)  
  
# Create a scatter plot of mpg against hp  
plot(mtcars$hp, mtcars$mpg, xlab = "Horsepower", ylab = "Miles Per Gallon", main = "Scatter Plot of mpg against hp")



#6. Given a vector a = c("a", "b", "c", "d", "e"), extract the 2nd and 4th elements  
  
a <- c("a", "b", "c", "d", "e")  
extracted\_elements <- a[c(2, 4)] # Extract the 2nd and 4th elements  
extracted\_elements

## [1] "b" "d"

#7. From the mtcars dataset, select the rows where cyl is 4 and only the columns mpg, hp, and wt:   
  
selected\_data <- mtcars[mtcars$cyl == 4, c("mpg", "hp", "wt")]  
selected\_data

## mpg hp wt  
## Datsun 710 22.8 93 2.320  
## Merc 240D 24.4 62 3.190  
## Merc 230 22.8 95 3.150  
## Fiat 128 32.4 66 2.200  
## Honda Civic 30.4 52 1.615  
## Toyota Corolla 33.9 65 1.835  
## Toyota Corona 21.5 97 2.465  
## Fiat X1-9 27.3 66 1.935  
## Porsche 914-2 26.0 91 2.140  
## Lotus Europa 30.4 113 1.513  
## Volvo 142E 21.4 109 2.780

#8. Create a list `my\_list` that contains three elements: a numeric vector (1, 2, 3), a character vector (“a”, “b”, “c”), and a matrix with 2 rows and 2 columns.  
my\_list <- list(numeric\_vector = c(1, 2, 3), character\_vector = c("a", "b", "c"), matrix = matrix(1:4, nrow = 2))  
my\_list

## $numeric\_vector  
## [1] 1 2 3  
##   
## $character\_vector  
## [1] "a" "b" "c"  
##   
## $matrix  
## [,1] [,2]  
## [1,] 1 3  
## [2,] 2 4

#9. Add a new element to `my\_list` that is a logical vector (TRUE, FALSE).  
my\_list$log\_vector <- c(TRUE, FALSE)  
my\_list

## $numeric\_vector  
## [1] 1 2 3  
##   
## $character\_vector  
## [1] "a" "b" "c"  
##   
## $matrix  
## [,1] [,2]  
## [1,] 1 3  
## [2,] 2 4  
##   
## $log\_vector  
## [1] TRUE FALSE

# 10. Create character vector `words` with the elements “R”, “is”, “fun”.  
words <- c("R", "is", "fun")  
words

## [1] "R" "is" "fun"

# 11. Use a function to concatenate these words into a single string: “R is fun”.  
concate\_string <- paste(words, collapse = " ")  
concate\_string

## [1] "R is fun"

# 12. Replace “fun” with “awesome” in the concatenated string.  
modified\_string <- gsub("fun", "awesome", concate\_string)  
modified\_string

## [1] "R is awesome"

# 13. From a numeric vector to a character vector: v\_num = c(1, 2, 3)  
v\_num <- c(1, 2, 3)  
v\_char <- as.character(v\_num)  
v\_char

## [1] "1" "2" "3"

# 14. From a character vector to a factor: v\_char = c("low", "medium", "high")  
v\_char <- c("low", "medium", "high")  
v\_fact <- factor(v\_char)  
v\_fact

## [1] low medium high   
## Levels: high low medium

# 15. From a factor to a numeric vector, considering the factor levels as numeric values: f = factor(c(1, 2, 3)).  
f <- factor(c(1, 2, 3))  
numeric\_vector <- as.numeric(as.character(f))  
numeric\_vector

## [1] 1 2 3

# 16. colors = c(“red”, “blue”, “green”, “blue”, “red”, “green”, “green”, “red”)  
colors <- c("red", "blue", "green", "blue", "red", "green", "green", "red")  
f\_colors <- factor(colors)  
f\_colors

## [1] red blue green blue red green green red   
## Levels: blue green red

levels(f\_colors)

## [1] "blue" "green" "red"

f\_colors <- factor(colors, levels = c("green", "blue", "red"))  
f\_colors

## [1] red blue green blue red green green red   
## Levels: green blue red

# 17.   
  
my\_list <- list(name = "Alice", age = 30, hobbies = c("Cycling", "Art", "Music"))  
my\_df <- data.frame(Name = c("Alice", "Bob"), Age = c(25, 30))  
my\_list

## $name  
## [1] "Alice"  
##   
## $age  
## [1] 30  
##   
## $hobbies  
## [1] "Cycling" "Art" "Music"

my\_df

## Name Age  
## 1 Alice 25  
## 2 Bob 30

#--- Access and print the hobbies element from my\_list  
my\_list$hobbies

## [1] "Cycling" "Art" "Music"

#--- Add a new column Occupation to my\_df with values “Doctor” for Alice and “Engineer” for Bob.  
my\_df$Occupation <- c("Doctor", "Engineer")  
my\_df

## Name Age Occupation  
## 1 Alice 25 Doctor  
## 2 Bob 30 Engineer