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Worksheet-1 in R

Worksheet for R Programming

Instructions:

- Use RStudio or the RStudio Cloud accomplish this worksheet. + Save the R script as *RWorksheet_lastname#1.R*.
- Create your own *GitHub repository* and push the R script as well as this pdf worksheet to your own repo.

Accomplish this worksheet by answering the questions being asked and writing the code manually.

Using functions:

seq(), assign(), min(), max(), c(), sort(), sum(), filter()

1. Set up a vector named age, consisting of 34, 28, 22, 36, 27, 18, 52, 39, 42, 29, 35, 31, 27, 22, 37, 34, 19, 20, 57, 49, 50, 37, 46, 25, 17, 37, 42, 53, 41, 51, 35, 24, 33, 41.

   a. How many data points?
   Ans. There are 34 data points.

   b. Write the R code and its output.
   df<-data.frame((age <- c(34, 28, 22, 36, 27, 18, 52, 39,
   42, 29, 35, 31, 27, 22, 37, 34,
   19, 20, 57, 49, 50, 37, 46, 25,
   17, 37, 42, 53, 41, 51, 35, 24,
   33, 41))

2. Find the reciprocal of the values for age.

   Write the R code and its output.

   age <- c(34, 28, 22, 36, 27, 18, 52, 39,

42, 29, 35, 31, 27, 22, 37, 34,

19, 20, 57, 49, 50, 37, 46, 25,

17, 37, 42, 53, 41, 51, 35, 24,

33, 41)

recip_num <- 1/age

recip_num

output:

0.02941176 0.03571429 0.04545455 0.02777778 0.03703704 0.05555556 0.01923077

0.02564103 0.02380952 0.03448276 0.02857143 0.03225806 0.03703704 0.04545455

0.02702703 0.02941176 0.05263158 0.05000000 0.01754386 0.02040816 0.02000000

0.02702703 0.02173913 0.04000000 0.05882353 0.02702703 0.02380952 0.01886792

0.02439024 0.01960784 0.02857143 0.04166667 0.03030303 0.02439024

3. Assign also new_age <- c(age, 0, age).

   What happen to the new_age?
   Ans. The data points become 69. And the output adds 0 and after it, the following ages repeat.

4. Sort the values for age.

Write the R code and its output.

Ans. sort(age)

[1] 17 18 19 20 22 22 24 25 27 27 28 29 31 33 34 34 35 35 36 37 37 37 39 41 41 42 42

[28] 46 49 50 51 52 53 57

5. Find the minimum and maximum value for age.

Write the R code and its output.

Answer: min(age)
output: 17

Answer: max(age)
output: 57

6. Set up a vector named data, consisting of 2.4, 2.8, 2.1, 2.5, 2.4, 2.2, 2.5, 2.3, 2.5, 2.3, 2.4, and 2.7.

a. How many data points?
Answer: There are 12 data points.

b. Write the R code and its output.

```
data <- c(2.4, 2.8, 2.1, 2.5, 2.4, 2.2, 2.5, 2.3,
          2.5, 2.3, 2.4, 2.7)
data
 [1] 2.4 2.8 2.1 2.5 2.4 2.2 2.5 2.3 2.5 2.3 2.4 2.7
```

7. Generates a new vector for data where you double every value of the data. What happen to the data?

Answer: The data were multiply into 2 and every value of the data was been doubled.

8. Generate a sequence for the following scenario:

8.1 Integers from 1 to 100.
Answer: seq(1:100)

8.2 Numbers from 20 to 60
Answer: seq(20,60)

8.3 Mean of numbers from 20 to 60
Answer: 40

8.4 Sum of numbers from 51 to 91
Answer: 2911

8.5 Integers from 1 to 1,000

Answer: seq(1:1000)

8.4 How many data points from 8.1 to 8.4?

Answer: There are 182 data points from 8.1 to 8.4.

a. Write the R code and its output from 8.1 to 8.4.

8.1 seq(1:100) output: numbers sequence from 1 to 100

8.2 seq(20,60) output: numbers sequence from 20 to 60

8.3 mean(20:60) output: the mean is 40.

8.4 sum(51:91) output: the sum is 2911.

b. For 8.5 find only maximum data points until 10.

```
var <- c(1:10)
max(var)
```

9. *Print a vector with the integers between 1 and 100 that are not divisible by 3, 5 and 7 using filter option.

filter(function(i) { all(i %% c(3,5,7) != 0) }, seq(100))

Write the R code and its output.

```
Filter(function(i) { all(i %% c(3,5,7) != 0) }, seq(100))
```

Output: 1 2 4 8 11 13 16 17 19 22 23 26 29 31 32 34 37 38 41 43 44 46 47 52 53 58 59 61 62 64 67 68 71 73 74 76 79 82 83 86 88 89 92 94 97

10. Generate a sequence backwards of the integers from 1 to 100.

Write the R code and its output.

Answer: seq(from = 100, to = 1)

Output:

100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81

80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61

60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41

40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

11. List all the natural numbers below 25 that are multiples of 3 or 5.

    Find the sum of these multiples.
    Answer: 168

    a. How many data points from 10 to 11?
    Answer: 113 data points

    b. Write the R code and its output from 10 and 11.
    Answer: a <- seq(from = 100, to =1) b <- c(seq(3,25,3), seq(5,25,5))

12. Statements can be grouped together using braces '{' and '}'. A group of statements is sometimes called a **block**. Single statements are evaluated when a new line is typed at the end of the syntactically complete statement. Blocks are not evaluated until a new line is entered after the closing brace.

    Enter this statement:
    { x <- 0+ x + 5 + }
    Describe the output:

    Error: unexpected '}' in "{ x <- 0+ x + 5 + }"

13. *Set up a vector named score, consisting of 72, 86, 92, 63, 88, 89, 91, 92, 75, 75 and 77. To access individual elements of an atomic vector, one generally uses the x[i] construction. Find x[2] and x[3]. Write the R code and its output.
    Answer: x[2] = 86 x[3] = 92

14. *Create a vector a = c(1,2,NA,4,NA,6,7).
    a. Change the NA to 999 using the codes print(a,na.print="-999").

b. Write the R code and its output. Describe the output.

Answer: a = c(1,2,NA,4,NA,6,7)
print(a,na.print = "-999")
Output: 1 2 -999 4 -999 6 7

The expected output doesn't meet because the NA change into -999 instead of 999.

15. A special type of function calls can appear on the left hand side of the assignment operator as in > class(x) <- "foo".

Follow the codes below:
name = readline(prompt="Input your name: ") age = readline(prompt="Input your age: ") print(paste("My name is",name, "and I am",age ,"years old.")) print(R.version.string)
What is the output of the above code?

class(x) <- "foo"

> name = readline(prompt="Input your name: ")

Input your name: KYKY

> age = readline(prompt="Input your age: ")

Input your age: 19

> print(paste("My name is",name, "and I am",age ,"years old."))

[1] "My name is KYKY and I am 19 years old."

> print(R.version.string)

[1] "R version 3.4.1 (2017-06-30)"