Ben Robert T. Salve. BSIT 2-A   September 23, 2022

Cs 101

(Answers below)

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?

   b. Write the R code and its output.

2. Find the reciprocal of the values for age.

   Write the R code and its output.

3. Assign also new_age <- c(age, 0,age). What
    happen to the new_age?

4. Sort the values for age.
    Write the R code and its output.

5. Find the minimum and maximum value for age.
    Write the R code and its output.

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?

    b. Write the R code and its output.

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

8. Generate a sequence for the following scenario:

   8.1 Integers from 1 to 100.

   8.2 Numbers from 20 to 60

   *8.3 Mean of numbers from 20 to 60

   *8.4 Sum of numbers from 51 to 91

   *8.5 Integers from 1 to 1,000

   a. How many data points from 8.1 to 8.4?_____

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

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

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.

10. Generate a sequence backwards of the integers from 1 to100.

  Write the R code and its output.

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

     the sum of these multiples.

     a. How many data points from 10 to 11?

     b. Write the R code and its output from 10 and 11.

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.

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.

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.

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 ,"yearsold.")) print(R.version.string)
   What is the output of the above code?

```
#Worksheet 1
#Ben Robert T. Salve. BSIT 2-A

#1)
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.)
length(age)
age

#a. 34 data points.

#b.
#R code: 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.)
#length(age)
#age

#output: [1] 34 28 22 36 27 18 52 39 42 29 35 31 27 22 37 34 19
#[18] 20 57 49 50 37 46 25 17 37 42 53 41 51 35 24 33 41

#2)
recip.age <- 1/age
recip.age

#R code: recip.age <- 1/age
#recip.age


#output:[1] 0.02941176 0.03571429 0.04545455 0.02777778 0.03703704 0.05555556
0.01923077 0.02564103
#[9] 0.02380952 0.03448276 0.02857143 0.03225806 0.03703704 0.04545455 0.02702703
0.02941176
#[17] 0.05263158 0.05000000 0.01754386 0.02040816 0.02000000 0.02702703 0.02173913
0.04000000
#[25] 0.05882353 0.02702703 0.02380952 0.01886792 0.02439024 0.01960784 0.02857143
0.04166667
#[33] 0.03030303 0.02439024

#3)
new_age <- c(age,0,age)
new_age

#Answer: It displayed the previous output of age twice but with a 0 in the middle.

#4)
sort(age)
```

```
#R code: sort(age)

#output: [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 46 49 50
#[31] 51 52 53 57

#5)
min(age)
max(age)

#R code: min(age)
#max(age)

#output:> min(age)
#[1] 17
#> max(age)
#[1] 57

#6)
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)
length(data)

#a. 12 data points

#b.
#R code: 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)
#length(data)

#output: [1] 12

#7)
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*2

#Answer: It doubled the value of data.

#8)
1:100 #8.1
20:60 #8.2
mean(20:60) #8.3
sum(51:91) #8.4
1:1000 #8.5

length(1:100)
length(20:60)
```

```
length(mean(20:60))
length(sum(51:91))
```

#a. 100, 41, 1, and 1. A total of 143 data points.

#b.
#R code:
#8.1 1:100
#8.2 20:60
#8.3 mean(20:60)
#8.4 sum(51:91)

#output:
#8.1
[1]   1   2   3   4   5   6   7   8   9 10 11 12 13 14 15 16 17 18 19 20 21 22
[23] 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
[45] 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66
[67] 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88
[89] 89 90 91 92 93 94 95 96 97 98 99 100

#8.2
[1] 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
48 49
[31] 50 51 52 53 54 55 56 57 58 59 60

#8.3
[1] 40

#8.4
[1] 2911

#c. max(1:10)
[1] 10

#9)
Filter(function(i) { all(i %% c(3,5,7) != 0) }, seq(100))

#R code: Filter(function(i) { all(i %% c(3,5,7) != 0) }, seq(100))

#output: [1] 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
[31] 67 68 71 73 74 76 79 82 83 86 88 89 92 94 97

#10)
100:1
```

```
#R code: 100:1

#output: [1] 100  99  98  97  96  95  94  93  92  91  90  89  88  87  86  85  84  83  82  81  80  79
# [23]  78  77  76  75  74  73  72  71  70  69  68  67  66  65  64  63  62  61  60  59  58  57
# [45]  56  55  54  53  52  51  50  49  48  47  46  45  44  43  42  41  40  39  38  37  36  35
# [67]  34  33  32  31  30  29  28  27  26  25  24  23  22  21  20  19  18  17  16  15  14  13
# [89]  12  11  10   9   8   7   6   5   4   3   2   1
```

#11)
sum((1 : 25)[((1 : 25)%%3 == 0) | ((1:25)%%5 == 0)])

#a. 101 data points.

#b.
#R code: #10 100:1
#11 sum((1 : 25)[((1 : 25)%%3 == 0) | ((1:25)%%5 == 0)])

```
#output: #10 [1] 100  99  98  97  96  95  94  93  92  91  90  89  88  87  86  85  84  83  82  81
80  79
# [23]  78  77  76  75  74  73  72  71  70  69  68  67  66  65  64  63  62  61  60  59  58  57
# [45]  56  55  54  53  52  51  50  49  48  47  46  45  44  43  42  41  40  39  38  37  36  35
# [67]  34  33  32  31  30  29  28  27  26  25  24  23  22  21  20  19  18  17  16  15  14  13
# [89]  12  11  10   9   8   7   6   5   4   3   2   1
```

#11 [1] 168

#12)
{ x <- 0+ x + 5 + }
#Answer: The output is "Error: unexpected '}' in "{ x <- 0+ x + 5 + }"", this is an error but if you put {', '} at both ends you will get an output of [1] " x <- 0+ x + 5 + ".

#13)
score <- c(72, 86, 92, 63, 88, 89, 91, 92, 75, 75, 77)
x[i]
score[2]
score[3]

#R code: score <- c(72, 86, 92, 63, 88, 89, 91, 92, 75, 75, 77)
#score[2]
#score[3]

#output: [1] 86
[1] 92

#14)
a = c(1,2,NA,4,NA,6,7)

9

```
print(a,na.print="-999")
a
```

#R code: a = c(1,2,NA,4,NA,6,7)
print(a,na.print="-999")

#output: [1]   1   2 -999   4 -999   6   7. After running the print, it change the NA to -999.
But if you run "a" the output is "[1] 1 2 NA 4 NA 6 7".

#15)
```
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)
```

#output: [1] "My name is Ben Robert T. Salve and I am 20 years old."
[1] "R version 4.2.1 (2022-06-23)"