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BSIT - 2B

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.

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)

age

a. How many data points?

34 Data Points.

b. Write the R code and its output.

```
nbrpts ← length(age)
nbpts
```

```
[1] 34
```

2. Find the reciprocal of the values for age.
Write the R code and its output.

```
reciprocal_age <- 1 / age
```

```
reciprocal_age
```

```
[1] 0.02941176 0.03571429 0.04545455
[4] 0.02777778 0.03703704 0.05555556
[7] 0.01923077 0.02564103 0.02380952
[10] 0.03448276 0.02857143 0.03225806
[13] 0.03703704 0.04545455 0.02702703
```

[16] 0.02941176 0.05263158 0.05000000

[19] 0.01754386 0.02040816 0.02000000

[22] 0.02702703 0.02173913 0.04000000

[25] 0.05882353 0.02702703 0.02380952

[28] 0.01886792 0.02439024 0.01960784

[31] 0.02857143 0.04166667 0.03030303

[34] 0.02439024

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

new_age ← c(age, 0, age)

new_age

What happened to the new_age?

The new_age has 0 between the 2 ages.

4. Sort the values for age.

Write the R code and its output.

sort(age)

[1] 17 18 19 20 22 22 24 25 27 27 28 29 31 33

[15] 34 34 35 35 36 37 37 37 39 41 41 42 42 46

[29] 49 50 51 52 53 57

5. Find the minimum and maximum value for age.

Write the R code and its output.

min(age)

[1] 17

max(age)

[1] 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.

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)

a. How many data points?

12 data points.

b. Write the R code and its output.

```
nmbrofdtps <- length(data)
nmbrofdtps
```

[1] 12

7. Generates a new vector for data where you double every value of the data.

```
newData <- 2 * data
newData
```

What happened to the data?

The data doubles and was multiplied by 2.

8. Generate a sequence for the following scenario:

8.1 Integers from 1 to 100.

```
Int <- seq(1:100)
Int
```

8.2 Numbers from 20 to 60

```
Num <- seq(from=20,to=60)
Num
```

8.3 Mean of numbers from 20 to 60

```
 Num <- seq(from=20, to=60)
xNum <- mean(Num)
xNum
```

8.4 Sum of numbers from 51 to 91

```
sNum <- sum(51:91)

sNum
```

8.5 Integers from 1 to 1,000

```
sInt <- seq(1:1000)
sInt
```

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

143 Data Points.

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

```
dtpts <- length(c(Int, Num, xNum, sNum))

dtpts
```

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

```
mxdtpts <- Int[1:10]
 mxdtpts
length(mxdtpts)
```

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

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

 [1]  1  2  4  8 11 13 16 17 19 22 23 26 29 31

[15] 32 34 37 38 41 43 44 46 47 52 53 58 59 61

[29] 62 64 67 68 71 73 74 76 79 82 83 86 88 89

[43] 92 94 97
```

10. Generate a sequence backwards of the integers from 1 to 100. Write the R code and its output.

```
reve <- rev(seq(1:100))
reve

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

x <- Filter(function(i) {any(i %% c(3,5) ==0)}, seq(24))

x

Sumofx <- sum(x)

Sumofx

a. How many data points from 10 to 11?

112 Data Points.

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

```
dtpt <- length(c(reve, x, Sumofx))
dtpt

[1] 112
```

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.

The output is "Error" because it expects a number after the + sign.

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.

```
score <- c(72, 86, 92, 63, 88, 89, 91, 92, 75, 75,77.)

s2 <- score[2]
s2
        [1] 86

s3 <- score[3]
 s3

        [1] 92
```

14. *Create a vector a = c(1,2,NA,4,NA,6,7).

a. Change the NA to 999 using the code print(a,na.print="-999").
b. Write the R code and its output. Describe the output.

```
a <- c(1, 2 ,NA, 4, NA, 6, 7)
print(a,na.print="-999")

    [1]    1    2 -999    4 -999    6    7
```

-999 replaced NA

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?

[1] "My name is age = readline(prompt=\"Input your age: \") and I am 34 years old."
[2] "My name is age = readline(prompt=\"Input your age: \") and I am 28 years old."
[3] "My name is age = readline(prompt=\"Input your age: \") and I am 22 years old."
[4] "My name is age = readline(prompt=\"Input your age: \") and I am 36 years old."
[5] "My name is age = readline(prompt=\"Input your age: \") and I am 27 years old."
[6] "My name is age = readline(prompt=\"Input your age: \") and I am 18 years old."
[7] "My name is age = readline(prompt=\"Input your age: \") and I am 52 years old."
[8] "My name is age = readline(prompt=\"Input your age: \") and I am 39 years old."
[9] "My name is age = readline(prompt=\"Input your age: \") and I am 42 years old."
[10] "My name is age = readline(prompt=\"Input your age: \") and I am 29 years old."
[11] "My name is age = readline(prompt=\"Input your age: \") and I am 35 years old."
[12] "My name is age = readline(prompt=\"Input your age: \") and I am 31 years old."
[13] "My name is age = readline(prompt=\"Input your age: \") and I am 27 years old."
[14] "My name is age = readline(prompt=\"Input your age: \") and I am 22 years old."

[15] "My name is age = readline(prompt=\"Input your age: \") and I am 37 years old."
[16] "My name is age = readline(prompt=\"Input your age: \") and I am 34 years old."
[17] "My name is age = readline(prompt=\"Input your age: \") and I am 19 years old."
[18] "My name is age = readline(prompt=\"Input your age: \") and I am 20 years old."
[19] "My name is age = readline(prompt=\"Input your age: \") and I am 57 years old."
[20] "My name is age = readline(prompt=\"Input your age: \") and I am 49 years old."
[21] "My name is age = readline(prompt=\"Input your age: \") and I am 50 years old."
[22] "My name is age = readline(prompt=\"Input your age: \") and I am 37 years old."
[23] "My name is age = readline(prompt=\"Input your age: \") and I am 46 years old."
[24] "My name is age = readline(prompt=\"Input your age: \") and I am 25 years old."
[25] "My name is age = readline(prompt=\"Input your age: \") and I am 17 years old."
[26] "My name is age = readline(prompt=\"Input your age: \") and I am 37 years old."
[27] "My name is age = readline(prompt=\"Input your age: \") and I am 42 years old."
[28] "My name is age = readline(prompt=\"Input your age: \") and I am 53 years old."
[29] "My name is age = readline(prompt=\"Input your age: \") and I am 41 years old."
[30] "My name is age = readline(prompt=\"Input your age: \") and I am 51 years old."
[31] "My name is age = readline(prompt=\"Input your age: \") and I am 35 years old."
[32] "My name is age = readline(prompt=\"Input your age: \") and I am 24 years old."
[33] "My name is age = readline(prompt=\"Input your age: \") and I am 33 years old."
[34] "My name is age = readline(prompt=\"Input your age: \") and I am 41 years old."

> (R.version.string)
[1] "R version 4.4.1 (2024-06-14 ucrt)"

It uses the age that was set up in the first place.