

Worksheet-2 in R

Worksheet for R Programming

Instructions:

- Use RStudio or the RStudio Cloud accomplish this worksheet. + Save the R script as *RWorksheet_lastname#2.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 Vectors

1. Create a vector using : operator

a. Sequence from -5 to 5. Write the R code and its output. Describe its output.

```
numseq <- (-5:5)
numseq
[1] -5 -4 -3 -2 -1  0  1  2  3  4  5
```

b. `x <- 1:7`. What will be the value of x?

```
x <- c(1:7)
x
[1] 1 2 3 4 5 6 7
```

2.* Create a vector using `seq()` function

a. `seq(1, 3, by=0.2)` # specify step size

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

```
seq(1,3,0.2)
[1] 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0
```

3. A factory has a census of its workers. There are 50 workers in total. The following list shows their ages: 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, 43, 53, 41, 51, 35, 24, 33, 41, 53, 40, 18, 44, 38, 41, 48, 27, 39, 19, 30, 61, 54, 58, 26, 18.

```
ages <- 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, 43, 53, 41, 51, 35, 24, 33, 41, 53, 40, 18, 44, 38, 41, 48, 27, 39, 19, 30, 61, 54, 58, 26, 18)
```

- a. Access 3rd element, what is the value?

```
ages[3]
[1] 22
```

- b. Access 2nd and 4th element, what are the values?

```
ages[2]
[1] 28
```

```
ages[4]
[1] 36
```

- c. Access all but the 1st element is not included. Write the R code and its output.

```
ages[-1]
[1] 28 22 36 27 18 52 39 42 29 35 31 27 22 37 34 19 20 57 49 50 37 46 25
[24] 17 37 43 53 41 51 35 24 33 41 53 40 18 44 38 41 48 27 39 19 30 61 54
[47] 58 26 18
```

4. *Create a vector `x <- c("first"=3, "second"=0, "third"=9)`. Then name the vector, `names(x)`.

- a. Print the results. Then access `x[c("first", "third")]`. Describe the output.

```
x[c("first", "third")]
first third
3         9
```

- b. Write the code and its output.

```
x <- c("first"=3, "second"=0, "third"=9)
names(x)
```

```
[1] "first" "second" "third"
```

5. Create a sequence x from -3:2.

- a. Modify 2nd element and change it to 0; `x[2] <- 0`
x

Describe the output.

```
x[2] <- 0  
x  
[1] -3 0 -1 0 1
```

- b. Write the code and its output.

```
<-c(-3:2)  
x  
[1] -3 -2 -1 0 1 2
```

6. *The following data shows the diesel fuel purchased by Mr. Cruz.

Month	Jan	Feb	March	Apr	May	June
Price per liter (PhP)	52.50	57.25	60.00	65.00	74.25	54.00
Purchase-quantity(Liters)	25	30	40	50	10	45

- a. Create a data frame for month, price per liter (php) and purchase-quantity (liter). Write the codes.

```
data.frame(month,Php, Liter)  
  month    Php Liter  
1  january 52.50    25  
2 February 57.25    30  
3   March 60.00    40  
4   April 65.00    50  
5    May 74.25    10  
6   June 54.00    45
```

- b. What is the average fuel expenditure of Mr. Cruz from Jan to June? Note:

Use `weighted.mean(liter, purchase)`

```
av_fuel <- weighted.mean(Php, Liter)
av_fuel
[1] 59.2625
```

7. R has actually lots of built-in datasets. For example, the rivers data “gives the lengths (in miles) of 141 “major” rivers in North America, as compiled by the US Geological Survey”.

- a. Type “rivers” in your R console. Create a vector data with 7 elements, containing the number of elements (length) in rivers, their sum (sum), mean (mean), median (median), variance(var) standard deviation (sd), minimum (min) and maximum(max).

```
data <- c(length(rivers), sum(rivers), mean(rivers), median(rivers), var(rivers), sd(rivers), min(rivers), max(rivers))
```

- b. What are the results?

```
[1] 141.0000 83357.0000 591.1844 425.0000 243908.4086
[6] 493.8708 135.0000 3710.0000
```

- c. Write the code and its outputs.

```
data <- c(length(rivers), sum(rivers), mean(rivers), median(rivers), var(rivers), sd(rivers), min(rivers), max(rivers))
> data
```

8. The table below gives the 25 most powerful celebrities and their annual pay as ranked by the editions of Forbes magazine and as listed on the Forbes.com website.

Power Ranking	Celebrity Name	Pay	Power Ranking	Celebrity Name	Pay
1	Tom Cruise	67	14	Paul McCartney	40
2	Rolling Stones	90	15	George Lucas	233
3	Oprah Winfrey	225	16	Elton John	34
4	U2	110	17	David Letterman	40
5	Tiger Woods	90	18	Phil Mickelson	47
6	Steven Spielberg	332	19	J.K. Rowling	75
7	Howard Stern	302	20	Bradd Pitt	25
8	50 Cent	41	21	Peter Jackson	39
9	Cast of the Sopranos	52	22	Dr. Phil McGraw	45
10	Dan Brown	88	23	Jay Lenon	32
11	Bruce Springsteen	55	24	Celine Dion	40
12	Donald Trump	44	25	Kobe Bryant	31
13	Muhammad Ali	55			

Figure 1: Forbes Ranking

- a. Create vectors according to the above table. Write the codes.

```
pr=c(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25)
pr
[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
[24] 24 25

celeb_name=c("Tom Cruise", "Rolling Stones", "Oprah Winfrey", "U2", "Tiger Woods", "Steven Spielberg", "Howard Stern", "50 Cent", "Cast of the Sopranos", "Dan Brown", "Bruce Springsteen", "Donald Trump", "Muhammad Ali", "Paul McCartney", "George Lucas", "Elton John", "David Letterman", "J.K. Rowling", "Bradd Pitt", "Peter Jackson", "Dr. Phil McGraw", "Jay lenon", "Celine Dion", "Kobe Bryan")
celeb_name
[1] "Tom Cruise"          "Rolling Stones"      "Oprah Winfrey"
[4] "U2"                  "Tiger Woods"         "Steven Spielberg"
[7] "Howard Stern"        "50 Cent"             "Cast of the Sopranos"
[10] "Dan Brown"           "Bruce Springsteen"   "Donald Trump"
[13] "Muhammad Ali"        "Paul McCartney"      "George Lucas"
[16] "Elton John"          "David Letterman"     "Phil Mickelson"
[19] "J.K. Rowling"        "Bradd Pitt"          "Peter Jackson"
[22] "Dr. Phil McGraw"     "Jay lenon"           "Celine Dion"
[25] "Kobe Bryan"
```

```
pay<-c(67, 90,225, 110, 90, 332, 302, 41, 52, 88, 55, 44, 55, 40, 233, 34, 40, 47, 75,
25, 39, 45, 32, 40, 31)
pay
[1] 67 90 225 110 90 332 302 41 52 88 55 44 55 40 233 34 40[18] 47 75 2
5 39 45 32 40 31
```

- b. Modify the power ranking and pay of J.K. Rowling. Change power ranking to 15 and pay to 90. Write the codes and its output.

```
pr[19]<-15
pr
[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 15 20 21 22 23
[24] 24 25

pay[19]<-90
pay
[1] 67 90 225 110 90 332 302 41 52 88 55 44 55 40 233 34 40
[18] 47 90 25 39 45 32 40 31
```

- c. Interpret the data.

```
Ranking <-data.frame(pr, celeb_name, pay)
Ranking
9. pr celeb_name pay
10. 1 1 Tom Cruise 67
11. 2 2 Rolling Stones 90
12. 3 3 Oprah Winfrey 225
13. 4 4 U2 110
14. 5 5 Tiger Woods 90
15. 6 6 Steven Spielberg 332
16. 7 7 Howard Stern 302
17. 8 8 50 Cent 41
18. 9 9 Cast of the Sopranos 52
19. 10 10 Dan Brown 88
20. 11 11 Bruee Springsteen 55
21. 12 12 Donald Trump 44
22. 13 13 Muhammad Ali 55
23. 14 14 Paul McCartney 40
24. 15 15 George Lucas 233
25. 16 16 Elton John 34
26. 17 17 David Letterman 40
27. 18 18 Phil Mickelson 47
28. 19 15 J.K Rowling 90
29. 20 20 Bradd Pitt 25
30. 21 21 Peter Jackson 39
31. 22 22 Dr.Phil McGraw 45
32. 23 23 Jay lenon 32
33. 24 24 Celine Dion 40
34. 25 25 Kobe Bryan 31
```

