

Worksheet 2

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1. Create a vector using : operator

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

```
x <- -5:5  
x
```

```
## [1] -5 -4 -3 -2 -1 0 1 2 3 4 5
```

Describe its output. - The output displays the sequence of number from -5 up to 5.

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

```
x <- 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 - The step size is by 0.2s. Write the R code and its output

```
seq(1, 3, by=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
```

Describe its output. - The output displays the sequence of numbers from 1.0 until 3.0 with the difference of 0.2

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.

```
list_data <- 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)  
list_data
```

```
## [1] 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
## [26] 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?

```
third <- list_data[[3]]
third
```

```
## [1] 22
```

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

```
second <- list_data[[2]]
forth <- list_data[[4]]
elements <- c(second,forth)
elements
```

```
## [1] 28 36
```

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

```
removefirst <- list_data[2:50]
removefirst
```

```
## [1] 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
## [26] 43 53 41 51 35 24 33 41 53 40 18 44 38 41 48 27 39 19 30 61 54 58 26 18
```

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

a. Print the results.

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

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

Then access `x[c("first", "third")]`

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

```
## first third
##      3      9
```

Describe the output. - The output displays the “first” and “third” character horizontally and it create another row under it with the respective values of the characters inputted.

b. Write the code and its output

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

```
## first third  
##      3      9
```

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

```
seq <- -3:2  
seq
```

```
## [1] -3 -2 -1  0  1  2
```

Modify 2nd element and change it to 0;

```
seq[2] <- 0  
seq
```

```
## [1] -3  0 -1  0  1  2
```

Describe the output. - The 2nd element of sequence x or the -2 modifies or changes into 0.

Write the code and its output.

```
seq[2] <- 0  
seq
```

```
## [1] -3  0 -1  0  1  2
```

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

```
diesel_data <- data.frame(  
  Month = c("Price per liter(PHP)", "Purchase-quantity(Liters)") ,  
  Jan = c("52.50" , "25"),  
  Feb = c("57.25", "30"),  
  March = c("60.00", "40"),  
  Apr= c("65.00", "50"),  
  May = c("74.25", "10"),  
  June = c("54.00", "45")  
)  
diesel_data
```

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

b. What is the average fuel expenditure of Mr. Cruz from Jan to June? Note: Use `weighted.mean(liter, purchase)`

```
liter <- c(52.50, 57.25, 60.00, 65.00, 74.25, 54.00)
purchase <- c(25, 30, 40, 50, 10, 45)
weighted.mean(liter, purchase)
```

```
## [1] 59.2625
```

7. R has actually lots of built-in data sets. 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.

```
rivers
```

```
## [1] 735 320 325 392 524 450 1459 135 465 600 330 336 280 315 870
## [16] 906 202 329 290 1000 600 505 1450 840 1243 890 350 407 286 280
## [31] 525 720 390 250 327 230 265 850 210 630 260 230 360 730 600
## [46] 306 390 420 291 710 340 217 281 352 259 250 470 680 570 350
## [61] 300 560 900 625 332 2348 1171 3710 2315 2533 780 280 410 460 260
## [76] 255 431 350 760 618 338 981 1306 500 696 605 250 411 1054 735
## [91] 233 435 490 310 460 383 375 1270 545 445 1885 380 300 380 377
## [106] 425 276 210 800 420 350 360 538 1100 1205 314 237 610 360 540
## [121] 1038 424 310 300 444 301 268 620 215 652 900 525 246 360 529
## [136] 500 720 270 430 671 1770
```

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

b. What are the results?

```
data_rivers
```

```
## [1] 141.0000 83357.0000 591.1844 425.0000 243908.4086 493.8708
## [7] 135.0000 3710.0000
```

c. Write the code and its outputs.

```
rivers
```

```
## [1] 735 320 325 392 524 450 1459 135 465 600 330 336 280 315 870
## [16] 906 202 329 290 1000 600 505 1450 840 1243 890 350 407 286 280
## [31] 525 720 390 250 327 230 265 850 210 630 260 230 360 730 600
## [46] 306 390 420 291 710 340 217 281 352 259 250 470 680 570 350
## [61] 300 560 900 625 332 2348 1171 3710 2315 2533 780 280 410 460 260
## [76] 255 431 350 760 618 338 981 1306 500 696 605 250 411 1054 735
## [91] 233 435 490 310 460 383 375 1270 545 445 1885 380 300 380 377
## [106] 425 276 210 800 420 350 360 538 1100 1205 314 237 610 360 540
## [121] 1038 424 310 300 444 301 268 620 215 652 900 525 246 360 529
## [136] 500 720 270 430 671 1770
```

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

```
## [1] 141.0000 83357.0000 591.1844 425.0000 243908.4086 493.8708
## [7] 135.0000 3710.0000
```

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

```
Magazine_data <- data.frame(
  PowerRanking = c(1:25),
  CelebrityName = c("Tom Cruise", "Rolling Stones", "Oprah Winfrey", "U2",
    "Tiger Woods", "Steven Speilberg", "Howarf Stern", "50 Cent",
    "Cast of the sopranos", "Dan Brown", "Bruce Springsteen",
    "Donald Trump", "Muhammand Ali", "Paul McCartney",
    "George Lucas", "Elton John", "David Letterman", "Phil Mickelson",
    "J.K Rowling", "Bradd Pitt", "Peter Jackson",
    "Dr.Phil McGraw", "Jay Lenon", "Celine Dion", "Kobe Bryan"),
  Pay = c(67, 90, 225, 110, 90, 32, 302, 41, 52, 88, 55, 44, 55, 40, 233, 34, 40, 47, 75, 25, 39, 45, 32, 40, 31)
)
Magazine_data
```

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

```
Magazine_data[19,"PowerRanking"] <- 15
Magazine_data[19,"Pay"] <- 90
Magazine_data
```

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

- c. Interpret the data.

- The data shows that the Power Ranking and Pay of a Celebrity named J.K. Rowling was modified. Its power ranking was changed, and the sequence of power ranking of the table became disordered given that the power ranking of J.K. Rowling which is 19 was changed into 15 as well its pay from 75 to 90.