

Worksheet-2 in R

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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.

```
n <- seq(-5,5)
n
```

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

Describe its output.

The output display 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
```

The value of x is 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

```
num <- seq(1, 3, by=0.2)
num
```

```
## [1] 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0
```

Describe the output.

The output jump or add by 0.2. This is the output[1] 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0, it start in number 1 and then jump or add by 0.2 until it reach the number 3

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.

```
worker <- 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)
worker
```

```
## [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?

```
num1 <- worker[3]
num1
```

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

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

```
num2 <- worker[2]
num2
```

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

```
num3 <- worker[4]
num3
```

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

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

```
num4 <- worker[2:49]
num4
```

```
## [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
```

Write the R code and its output.

```
num4 <- worker[2:49]
num4
```

Output: [1] 28 22 36 27 18 52 39 42 29 35 31 27 22 37 34 19 20 57 49 50 37 46 217 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

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

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

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

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

```
z <- x[c("first", "third")]
z
```

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

Describe the output.

It is indexing an element. It access only the first and the third

B. Write the code and its output.

```
z <- x[c("first", "third")]
z
```

Output:

```
first third
3      9
```

5. create sequence `x` from `-3:2`.

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

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

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

Describe the output

It change the second element number which is -2 into 0

B. Write the code and its output.

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

Output:

```
[1] -3 0 -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.

```
month <- c("Jan", "Feb", "March", "Apr", "May", "June")
month
```

```
## [1] "Jan" "Feb" "March" "Apr" "May" "June"
```

```
price <- c(52.50, 57.25, 60.00, 65.00, 74.25, 54.00)
price
```

```
## [1] 52.50 57.25 60.00 65.00 74.25 54.00
```

```
purchase <- c(25, 30, 40, 50, 10, 45)
purchase
```

```
## [1] 25 30 40 50 10 45
```

Write the codes:

```
month <- c("Jan", "Feb", "March", "Apr", "May", "June") month
```

```
price <- c(52.50, 57.25, 60.00, 65.00, 74.25, 54.00) price
```

```
purchase <- c(25, 30, 40, 50, 10, 45)
purchase
```

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

```
average <- weighted.mean(price, purchase)
average
```

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

The Average of fuel expenditure of Mr. Cruz from Jan to June is 59.2565

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. 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))
data

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

B. What are the results?

The result is [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.

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

Output:

```
[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.

```
Power_Ranking <- 1:25
Power_Ranking

## [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 25
celebrity_name <- c("Tom Cruise", "Rolling Stones", "Oprah Winfrey", "U2",
                    "Tiger Woods", "Steven Spielberg", "Howard Stern", "50 Cent",
                    "Donald Trump", "Muhammad Ali", "Paul McCartney", "George Lucas",
                    "J.K Rowling", "Bradd Pitt", "Peter Jackson", "Dr. Phil McGraw",
celebrity_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 Bryant"

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 47 75
## [20] 25 39 45 32 40 31
```

```
Data_Ranking <- data.frame(Power_Ranking, celebrity_name, Pay)
Data_Ranking
```

```
## Power_Ranking celebrity_name 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 Spielberg 332
## 7          7      Howard 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          Muhammad 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 Bryant  31
```

Write the codes:

```
Power_Ranking <- 1:25
```

```
Power_Ranking
```

```
celebrity_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", "Phil Mickelson", "J.K Rowling", "Bradd Pitt", "Peter Jackson", "Dr. Phil McGraw", "Jay Lenon", "Celine Dion", "Kobe Bryant")
```

```
celebrity_name
```

```
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
```

```
Data_Ranking <- data.frame(Power_Ranking, celebrity_name, Pay)
```

```
Data_Ranking
```

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.

```
Power_Ranking [19] <- 15
```

```
Power_Ranking
```

```
## [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 25
```

```
Pay [19] <- 90
```

```
Pay
```

```
## [1] 67 90 225 110 90 332 302 41 52 88 55 44 55 40 233 34 40 47 90
## [20] 25 39 45 32 40 31
```

```
ranking <- data.frame(Power_Ranking, celebrity_name, Pay)
ranking
```

##	Power_Ranking	celebrity_name	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 Spielberg	332
## 7	7	Howard 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	Muhammad 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 Bryant	31

C. Interpret the data:

It list the data into column and rows in equal length using the data frame. In B. it change the power ranking of J.K Rowling to 15 and the pay is also change to 90