WorkSheet2

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R Markdown

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.

```
seq(-5:5)
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10 11
```

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

The result will shows numbers that is being added by 0.2 from 1 to 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,
4.

```
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)
ages
```

```
##  [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?

```
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[2:50]
```

```
##  [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).

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

```
##  first second  third
##      3      0      9
```

a. Print the results. Then access x[c(“first”, “third”)]. Describe the output.

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

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

b. Write the code and its output.

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

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

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

```
x <- c(-3:2)
x
```

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

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

```
x <- 0
x
```

```
## [1] 0
```

b. Write the code and its output.

```
x <- 0
x
```

```
## [1] 0
```

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

```
deisel <- data.frame(

  Months = c("Jan", "Feb", "March", "Apr", "May", "June"),
  Php = c(52.50, 57.25, 60.00, 65.00,74.25, 54.00),
  Liter = c(25, 30, 40, 50, 10, 45),
  stringsAsFactors = FALSE
                    )
deisel
```

```
##   Months   Php Liter
## 1    Jan 52.50    25
## 2    Feb 57.25    30
## 3  March 60.00    40
## 4    Apr 65.00    50
## 5    May 74.25    10
## 6   June 54.00    45
```

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

```
deisel$Php
```

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

```
deisel$Liter
```

```
## [1] 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, Php)

weighted.mean(Liter,Php)

[**1] 32.65152**

```
deisel <- data.frame(

  Months <- c("Jan", "Feb", "March", "Apr", "May", "June"),
  Php <- c(52.50, 57.25, 60.00, 65.00,74.25, 54.00),
  Liter <- c(25, 30, 40, 50, 10, 45),
  stringsAsFactors = FALSE
                    )
weighted.mean(Liter,Php)
```

```
## [1] 32.65152
```

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))

```
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?

```
data
```

```
## [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
```

```
## [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. Figure 1: Forbes Ranking

```
PowerRanking <- 1:25
 Celebrities <- c("Tom Cruise", "Rolling Stones", "Oprah Winfrey", "U2", "Tiger Woods",
         "Steven Spielherg", "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")
 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)

 Ranking <- data.frame(PowerRanking, Celebrities, Pay)
 Ranking
```

```
##    PowerRanking          Celebrities 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 Spielherg 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
```

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

```
PowerRanking <- 1:25
 Celebrities <- c("Tom Cruise", "Rolling Stones", "Oprah Winfrey", "U2", "Tiger Woods",
         "Steven Spielherg", "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")
 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)

 Ranking <- data.frame(PowerRanking, Celebrities, Pay)
 Ranking
```

```
##    PowerRanking          Celebrities 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 Spielherg 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
```

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.

```
PowerRanking[19] <- 15;
 PowerRanking
```

```
##  [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
```

```
  ArtistRanking <- data.frame(PowerRanking, Celebrities, Pay)
  ArtistRanking
```

```
##    PowerRanking          Celebrities 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 Spielherg 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.

```
PowerRanking[19] <- 15;
  PowerRanking
```

```
##  [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
```

```
  ArtistRanking <- data.frame(PowerRanking, Celebrities, Pay)
  ArtistRanking
```

```
##    PowerRanking          Celebrities 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 Spielherg 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
```