Worksheet #2

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```
# Set default options
knitr::opts_chunk$set(echo = TRUE)

# 1. Create a vector using : operator
# a. Sequence from -5 to 5
seq1 <- c(-5:5)
seq1
```

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

```
# b. x <- 1:7. What will be the value of x?
seq2 <- c(1:7)
seq2
```

```
## [1] 1 2 3 4 5 6 7
```

```
# 2. Create a vector using seq() function
# a. seq(1, 3, by=0.2)
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
```

```
# Output: 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0

# 3. Factory worker ages
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)

# a. Access 3rd element
ages[3] # 3rd element is 22
```

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

```
# b. Access 2nd and 4th element
ages[2] # 2nd element is 28
```

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

```
ages[4] # 4th element is 36
```

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

```
# c. Access all but the 1st element
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 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
```

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

# a. Print names and access elements
names(x)   # "first" "second" "third"
```

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

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

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

```
# Output shows only "first" and "third"

# b. Print all and access selected
x
```

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

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

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

```
# 5. Create a sequence x from -3:2 and modify 2nd element
x <- -3:2
x
```

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

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

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

```
# Output: -3 0 -1 0 1 2

# 6. Diesel fuel data of Mr. Cruz
Month <- c("Jan", "Feb", "March", "Apr", "May", "June")
Liter <- c(52.50, 57.25, 60.00, 65.00, 74.25, 54.00)
Purchase <- c(25, 30, 40, 50, 10, 45)

diesel_fuel_purchased <- data.frame(Month, Liter, Purchase)

# Compute average fuel expenditure using weighted.mean
avg_fuel_expe <- weighted.mean(Liter, Purchase)
avg_fuel_expe
```

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

```
# 7. Built-in dataset: 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
```

```r
# length(rivers) = 141
# sum(rivers) = 83357
# mean(rivers) = 591.1844
# median(rivers) = 425
# var(rivers) = 243908.4086
# sd(rivers) = 493.8708
# min(rivers) = 135
# max(rivers) = 3710

# 8. Forbes Celebrity Data
rank <- 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)
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", "Brad 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)

forbes <- data.frame(rank, name, pay)
head(forbes)
```

```
##   rank             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
```

```r
# Modify J.K. Rowling's rank and pay
forbes[forbes$name == "J.K. Rowling", ]
```

```
##    rank         name pay
## 19   19 J.K. Rowling  75
```

```r
forbes[forbes$name == "J.K. Rowling", "rank"] <- 15
forbes[forbes$name == "J.K. Rowling", "pay"] <- 90
forbes[forbes$name == "J.K. Rowling", ]
```

```
##    rank         name pay
## 19   15 J.K. Rowling  90
```

```r
# Interpretation:
# J.K. Rowling's rank changed from 19 to 15.
# Her pay increased from 75 to 90.
# She became higher in ranking and earned more.
```