

# Lab Exercise #1

Carol D. Garcia

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```
# 1. Create a vector using : operator
```

```
x1 <- -5:5
```

```
print(x1)
```

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

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

```
x2 <- 1:7
```

```
print(x2) # Sequence from 1 to 7
```

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

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

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

```
x3 <- seq(1, 3, by = 0.2)
```

```
print(x3)
```

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

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

```
# 3. Accessing elements in a vector (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, 18)
```

```
# A. Access 3rd element
```

```
print(ages[3])
```

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

```
# [1] 22
```

```
# B. Access 2nd and 4th element
```

```
print(ages[c(2, 4)])
```

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

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

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

```
print(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 18
#[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 43 53 41 51 35 24 33 41
#[34] 53 40 18 44 38 41 48 27 39 19 30 61 54 58 26 18

# 4. Named vector
x4 <- c("first" = 3, "second" = 0, "third" = 9)
print(names(x4))

## [1] "first" "second" "third"
#[1] "first" "second" "third"
print(x4[c("first", "third")])

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

# 5. Modify vector
x5 <- -3:2
x5[2] <- 0
print(x5)

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

# 6. Data frame for Mr. Cruz's fuel purchases
months <- c("Jan", "Feb", "Mar", "Apr", "May", "Jun")
price_per_liter <- c(52.50, 57.25, 60.00, 65.00, 74.25, 54.00)
purchase_quantity <- c(25, 30, 40, 50, 10, 45)

#A. data frame
fuel_data <- data.frame(Month = months, Price_per_liter = price_per_liter, Purchase_quantity = purchase_quantity)
print(fuel_data)

##   Month Price_per_liter Purchase_quantity
## 1   Jan          52.50                25
## 2   Feb          57.25                30
## 3   Mar          60.00                40
## 4   Apr          65.00                50
## 5   May          74.25                10
## 6   Jun          54.00                45

#B. Average fuel expenditure
average_expenditure <- weighted.mean(price_per_liter, purchase_quantity)
print(average_expenditure)

## [1] 59.2625
#[1] 59.2625

# 7. Rivers data summary
data <- c(length(rivers), sum(rivers), mean(rivers), median(rivers), var(rivers), sd(rivers), min(rivers), max(rivers))
print(data)

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

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

```
# 8. Forbes Celebrity Rankings (Example code based on a hypothetical table)
```

```
# You would need to replace these values with actual celebrity names and earnings.
```

```
#A.
```

```
celebrity_names <- c("Celebrity 1", "Celebrity 2", "Celebrity 3", "J.K. Rowling", "Celebrity 5")
```

```
pay <- c(100, 90, 85, 80, 75)
```

```
ranking <- c(1, 2, 3, 4, 5)
```

```
#B.
```

```
celebrity_data <- data.frame(Name = celebrity_names, Pay = pay, Ranking = ranking)
```

```
print(celebrity_data)
```

```
##           Name Pay Ranking
## 1 Celebrity 1 100         1
## 2 Celebrity 2  90         2
## 3 Celebrity 3  85         3
## 4 J.K. Rowling 80         4
## 5 Celebrity 5  75         5
```

```
#C.
```

```
# Modify J.K. Rowling's ranking and pay
```

```
celebrity_data[celebrity_data$Name == "J.K. Rowling", c("Ranking", "Pay")] <- c(15, 90)
```

```
print(celebrity_data)
```

```
##           Name Pay Ranking
## 1 Celebrity 1 100         1
## 2 Celebrity 2  90         2
## 3 Celebrity 3  85         3
## 4 J.K. Rowling 90        15
## 5 Celebrity 5  75         5
```