Homework 2

Aysel Gulamzada 21080060

Before attempting to solve these homework questions make sure that you've install `tinytex` package onto your system with `install.packages(tinytex)` and `tinytex::install_tinytex()` commands. tinytex::pdflatex('test.tex')

Question 1 Calculate how many minutes in January.

```
hours <- 24 * 31
hours
```

```
## [1] 744
```

```
minutes <- hours * 60
minutes
```

```
## [1] 44640
```

Question 2 Add the numbers 3 1 4 1 5 9 2 6 without *using the addition sign.*

```
x <- c(3, 1, 4, 1, 5, 9, 2, 6)
sum(x)
```

```
## [1] 31
```

Question 3 Create a vector named `x` containing the series -1, -0.9, . . . , 0, 0.1, . . . , 0.9, 1 and print the result.

```
x <- seq(-1, 1, by = .1)
x
```

```
##  [1] -1.0 -0.9 -0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1  0.0  0.1  0.2  0.3  0.4
## [16]  0.5  0.6  0.7  0.8  0.9  1.0
```

```
print(x)
```

```
##  [1] -1.0 -0.9 -0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1  0.0  0.1  0.2  0.3  0.4
## [16]  0.5  0.6  0.7  0.8  0.9  1.0
```

Question 4 How do we get R to print the text "SBF!" 30 times without repeatingly typing it?

```r
x <- rep("SBF", 30)
x
```

```
##  [1] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
## [13] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
## [25] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
```

```r
print(x)
```

```
##  [1] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
## [13] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
## [25] "SBF" "SBF" "SBF" "SBF" "SBF" "SBF"
```

Question 5 Create two vectors named "wizards" and "ranking". Let the "wizards" include the names Harry, Ron, Fred, George and Sirius, while the "ranking" includes the numbers 4, 2, 5, 1, and 3.

```r
wizards <- c("Harry", "Ron", "Fred", "George", "Sirius")
wizards
```

```
## [1] "Harry"  "Ron"    "Fred"   "George" "Sirius"
```

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

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

Question 6 Print/extract the second element of the wizards vector.

```r
wizards["Ron"]
```

```
## [1] NA
```

```r
print(wizards["Ron"])
```

```
## [1] NA
```

Question 7 Replace the names Fred, George and Sirius in the vector 'wizards' with the names Hermione, Ginny, and Malfoy.

```r
wizards <- c("Harry", "Ron", "Fred", "George", "Sirius")
wizards
```

```
## [1] "Harry"  "Ron"    "Fred"   "George" "Sirius"
```

```r
y <- replace(wizards, 3 , "Hermione")
y
```

```
## [1] "Harry"    "Ron"      "Hermione" "George"   "Sirius"
```

```
x <- replace(y, 4, "Ginny")
x
```

```
## [1] "Harry"    "Ron"      "Hermione" "Ginny"    "Sirius"
```

```
wizards <- replace(x, 5, "Malfoy")
wizards
```

```
## [1] "Harry"    "Ron"      "Hermione" "Ginny"    "Malfoy"
```

Question 8 Anyone who hasn't read Harry Potter (like the professor of this class) needs tags to know who these characters are. Name the elements of the `wizards` vector as **Lead**, **Friend**, **Friend**, **Wife** and **Rival**. Print the results.

```
wizards <- c("Harry", "Ron", "Fred", "George", "Sirius")
wizards
```

```
## [1] "Harry"  "Ron"    "Fred"   "George" "Sirius"
```

Question 9 26 students entered the PEC206 midterm exam. The grades of these students are: 18, 95, 76, 90, 84, 83, 80, 79, 63, 76, 55, 78, 90, 81, 88, 89, 92, 73, 83, 72, 85, 66, 77, 82, 99 and 87. Save test scores in a vector named 'scores'. Calculate the mean, median, and range of exam grades.

```
scores <- c(18, 95, 76, 90, 84, 83, 80, 79, 63, 76, 55, 78, 90, 81, 88, 89, 92, 73, 83, 72, 85, 66, 77,
scores
```

```
##  [1] 18 95 76 90 84 83 80 79 63 76 55 78 90 81 88 89 92 73 83 72 85 66 77 82 99
## [26] 87
```

```
mean(scores)
```

```
## [1] 78.5
```

```
median(scores)
```

```
## [1] 81.5
```

```
range(scores)
```

```
## [1] 18 99
```

Question 10 In 2015, Nilay had an annual income of 22,000 TL, and total expenses of 3,000 TL. In 2016, his annual income was 67,000 TL, and his total expenses were 23,000 TL. In 2017, his annual income was 70,000TL, and his total expenses were 32,000TL. Finally, in 2018, his annual income was 72,000 TL and his total expenses were 35,000 TL. To save this information, create 3 different vectors named 'years', 'income' and 'expenses'. Calculate Nilay's annual savings and save these values in a vector named 'savings'.

```r
years <- c(2015, 2016, 2017, 2018)
years
```

```
## [1] 2015 2016 2017 2018
```

```r
income <- c(22000, 67000, 70000, 72000)
income
```

```
## [1] 22000 67000 70000 72000
```

```r
expenses <- c(3000, 23000, 32000, 35000)
expenses
```

```
## [1]  3000 23000 32000 35000
```

```r
savings <- income - expenses
savings
```

```
## [1] 19000 44000 38000 37000
```