Worksheet4

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#1A

```
data <- data.frame(
  Shoe_Size = c(6.5, 9.0, 8.5, 8.5, 10.5, 7.0, 9.5, 9.0, 13.0, 7.5, 10.5, 8.5, 12.0, 10.5, 13.0, 11.5, 8
Height = c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 70.0, 71.0, 72.0, 64.0, 74.75, 67.0, 71.0, 71.0, 77.0, 7
Gender = c("F", "F", "F", "F", "M", "F", "F", "F", "M", "F", "M", "F", "M", "M", "M", "M", "F", "F", "M
)
data
```

```
##    Shoe_Size Height Gender
## 1        6.5  66.00      F
## 2        9.0  68.00      F
## 3        8.5  64.50      F
## 4        8.5  65.00      F
## 5       10.5  70.00      M
## 6        7.0  64.00      F
## 7        9.5  70.00      F
## 8        9.0  71.00      F
## 9       13.0  72.00      M
## 10       7.5  64.00      F
## 11      10.5  74.75      M
## 12       8.5  67.00      F
## 13      12.0  71.00      M
## 14      10.5  71.00      M
## 15      13.0  77.00      M
## 16      11.5  72.00      M
## 17       8.5  59.00      F
## 18       5.0  62.00      F
## 19      10.0  72.00      M
## 20       6.5  66.00      F
## 21       7.5  64.00      F
## 22       8.5  67.00      M
## 23      10.5  73.00      M
## 24       8.5  69.00      F
## 25      10.5  72.00      M
## 26      11.0  70.00      M
## 27       9.0  69.00      M
## 28      13.0  70.00      M
```

#1-B

```r
females <- subset(data, Gender == "F", select = c(Shoe_Size, Height))
females
```

```
##    Shoe_Size Height
## 1        6.5   66.0
## 2        9.0   68.0
## 3        8.5   64.5
## 4        8.5   65.0
## 6        7.0   64.0
## 7        9.5   70.0
## 8        9.0   71.0
## 10       7.5   64.0
## 12       8.5   67.0
## 17       8.5   59.0
## 18       5.0   62.0
## 20       6.5   66.0
## 21       7.5   64.0
## 24       8.5   69.0
```

```r
males <- subset(data, Gender == "M", select = c(Shoe_Size, Height))
males
```

```
##    Shoe_Size Height
## 5       10.5  70.00
## 9       13.0  72.00
## 11      10.5  74.75
## 13      12.0  71.00
## 14      10.5  71.00
## 15      13.0  77.00
## 16      11.5  72.00
## 19      10.0  72.00
## 22       8.5  67.00
## 23      10.5  73.00
## 25      10.5  72.00
## 26      11.0  70.00
## 27       9.0  69.00
## 28      13.0  70.00
```

#1-C

```r
mean_shoe_size <- mean(data$Shoe_Size)
mean_shoe_size
```

```
## [1] 9.410714
```

```r
mean_height <- mean(data$Height)
mean_height
```

```
## [1] 68.58036
```

#2.

```r
Months <- c("March", "April", "JAnuary", "November", "January", "September", "October", "September", "N
factor_Months <- factor(Months)
factor_Months
```

```
##  [1] March     April     JAnuary   November  January   September October
##  [8] September November  August    January   November  November  Febraury
## [15] May       Augsut
## 11 Levels: April Augsut August Febraury January JAnuary March May ... September
```

#3

```r
summary(Months)
```

```
##    Length     Class      Mode
##        16 character character
```

```r
summary(factor_Months)
```

```
##     April    Augsut    August  Febraury   January   JAnuary     March       May
##         1         1         1         1         2         1         1         1
##  November   October September
##         4         1         2
```

#4

```r
directions <- c("East", "West", "North")
frequency <- c(1, 4, 3)

new_order_data <- factor(directions, levels = c("East", "West", "North"))
print(new_order_data)
```

```
## [1] East  West  North
## Levels: East West North
```

```r
table_data <- data.frame(Direction = new_order_data, Frequency = frequency)
print(table_data)
```

```
##   Direction Frequency
## 1      East         1
## 2      West         4
## 3     North         3
```

#5

```r
data <- read.table ("~/RBasics/CS101_DataScience/worksheet4a/import_march.csv", header = TRUE, sep = ",
head(data)
```

```
##   Students Strategy.1 Strategy.2 Strategy.3
## 1     Male          8         10          8
## 2                   4          8          6
## 3                   0          6          4
## 4   Female         14          4         15
## 5                  10          2         12
## 6                   6          0          9
```

#6

```
snack_price <- readline(prompt = "Enter the price of the snack (must be divisible by 50): ")
```

```
## Enter the price of the snack (must be divisible by 50):
```

```
snack_price <- as.integer(snack_price)

if (is.na(snack_price)) {
  cat("Invalid input. Please enter a numeric value.\n")
} else {
  minimum_bills <- function(price) {
    bills <- c(1000, 500, 200, 100, 50)
    count <- 0

    for (bill in bills) {
      if (price >= bill) {
        count <- count + (price %/% bill)
        price <- price %% bill
      }
    }

    return(count)
  }

  cat("Minimum number of bills needed:", minimum_bills(snack_price), "\n")
}
```

```
## Invalid input. Please enter a numeric value.
```

#7

```
snack_price <- readline(prompt = "Enter the price of the snack (must be divisible by 50): ")
```

```
## Enter the price of the snack (must be divisible by 50):
```

```
snack_price <- as.integer(snack_price)

if (is.na(snack_price) || snack_price %% 50 != 0) {
  cat("Invalid input. Please enter a numeric value that is divisible by 50.\n")
} else {
  minimum_bills <- function(price) {
    bills <- c(1000, 500, 200, 100, 50)
```

```
    count <- 0

    for (bill in bills) {
      if (price >= bill) {
        count <- count + (price %/% bill)
        price <- price %% bill
      }
    }

    return(count)
  }

  cat("Minimum number of bills needed:", minimum_bills(snack_price), "\n")
}
```

```
## Invalid input. Please enter a numeric value that is divisible by 50.
```

#8.a

```
data <- data.frame(
  Name = c("Annie", " Thea", "Steve", "Hanna"),
  Grade1 = c(85, 75, 75, 95),
  Grade2 = c(65, 75, 55, 75),
  Grade3 = c(85, 90, 80, 100),
  Grade4 = c(100, 90, 85, 90))
data
```

```
##    Name Grade1 Grade2 Grade3 Grade4
## 1 Annie     85     65     85    100
## 2  Thea     75     75     90     90
## 3 Steve     75     55     80     85
## 4 Hanna     95     75    100     90
```

#8.B

```
for (i in 1:nrow(data)) {
  avg_score <- sum(data[i, 2:5]) / 4

  if (avg_score >= 88.75) {
    cat(data$Name[i], "'s average grade this semester is", avg_score, "\n")
  }
}
```

```
## Hanna 's average grade this semester is 90
```

#8.C

```
for (i in 1:nrow(data)) {
  avg_score <- sum(data[i, 2:5]) / 4

  if (avg_score >= 88.75) {
    cat(data$Name[i], "'s average grade this semester is", avg_score, "\n")
  }
}
```

```
## Hanna 's average grade this semester is 90
```

#8.D

```
results <- c()

for (i in 1:nrow(data)) {
  highest_score <- 0

  for (j in 2:ncol(data)) {
    if (data[i, j] > highest_score) {
      highest_score <- data[i, j]
    }
  }

  if (highest_score > 90) {
    results <- c(results, paste(data$Name[i], "'s highest grade this semester is", highest_score))
  }
}

cat(results, "\n")
```

```
## Annie 's highest grade this semester is 100 Hanna 's highest grade this semester is 100
```