RWorksheet_Aguirre#4A

Ryza Faith

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1A. Describe the Data.

Shoe size is measured as a number, and most people in the data have shoe sizes between 8.5 and 10.5. Height shows more widely, but most people are between 64 and 72 inches tall.

```
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
```

1B.

```
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
```

1B.

```
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
```

1C.

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

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

1C.

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

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

D.Is there a relationship between shoe size and height? Why? - No, because the correlation coefficient between shoe size and height is close to 0, this would indicate no significant linear relationship between the two variables.

2. FACTOR

```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.Vector

```r
Directions <- c( "East", "West", "North")
Frequency <- c(1, 4, 3)
Directions
```

```
## [1] "East"  "West"  "North"
```

```r
Frequency
```

```
## [1] 1 4 3
```

4.Factor

```r
factor_data <- factor(Directions, levels = c("East", "West", "North"))
new_order_data <- factor(factor_data, levels = c("East", "West", "North"))

new_order_data
```

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

5.

```r
data <- read.table("~/DataScience/CS101/worksheet 4a/import_march.csv", header = TRUE, sep = ",", string
head(data)
```

```
##   Students Strategy.1 Stategy.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.

```r
exhaustive_search <- function(selected_number)
  if (selected_number < 1 || selected_number > 50) {
    return("The number selected is beyond the range of 1 to 50")
  } else if (selected_number == 20) {
    return("TRUE")
  } else {
    return(as.character(selected_number))
  }

random_number <- sample(1:50, 1)
cat("The chosen number is:", random_number, "\n")
```

```
## The chosen number is: 37
```

```r
result <- exhaustive_search(random_number)
cat("Result:", result, "\n")
```

```
## Result: 37
```

7.

```r
min_bills <- function(price) {
  bills <- c(1000, 500, 200, 100, 50)
  bill_count <- 0

  if (price %% 50 != 0) {
    return("Price must be a multiple of 50.")
```

```
  }

  for (bill in bills) {
    while (price >= bill) {
      price <- price - bill
      bill_count <- bill_count + 1
    }
  }

  return(bill_count)
}

price_of_snack <- 2700

cat("Minimum number of bills needed:", min_bills(price_of_snack), "\n")
```

```
## Minimum number of bills needed: 4
```

8A.

```
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
```

8B.

```
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
```

8C.

```
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
```

8D.

```
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
```