

## RWorksheet\_Aguirre#4A

Ryza Faith

2024-10-14

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, 8.5),
  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, 77.0, 77.0),
  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.

```
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

```
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.

```
summary(Months)
```

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

```
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

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

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

```
Frequency
```

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

## 4.Factor

```
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.

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

```
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))
  }

set.seed(Sys.time())
random_number <- sample(1:50, 1)
cat("The chosen number is:", random_number, "\n")
```

```
## The chosen number is: 32
```

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

```
## Result: 32
```

7.

```
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