

Rworksheet Espadon #4A

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#1 #A.

```
ShoeSize <- c(6.5, 9.0, 8.5, 8.5, 10.5, 10.5, 8.5, 12.0, 10.5, 8.5)
Height <- c(66.0, 68.0, 64.5, 65.0, 70.0, 64.0, 74.0, 67.0, 71.0, 71.0)

df <- data.frame(ShoeSize, Height)
print(df)
```

```
##      ShoeSize Height
## 1         6.5   66.0
## 2         9.0   68.0
## 3         8.5   64.5
## 4         8.5   65.0
## 5        10.5   70.0
## 6        10.5   64.0
## 7         8.5   74.0
## 8        12.0   67.0
## 9        10.5   71.0
## 10        8.5   71.0
```

#B.

```
males <- subset(df, ShoeSize>=9)
females <- subset(df, ShoeSize<9)

print(males)
```

```
##      ShoeSize Height
## 2         9.0     68
## 5        10.5     70
## 6        10.5     64
## 8        12.0     67
## 9        10.5     71
```

```
print(females)
```

```
##      ShoeSize Height
## 1         6.5   66.0
## 3         8.5   64.5
## 4         8.5   65.0
## 7         8.5   74.0
## 10        8.5   71.0
```

#c.

```
mean(df$ShoeSize)
```

```
## [1] 9.3
```

```
# 9.3
```

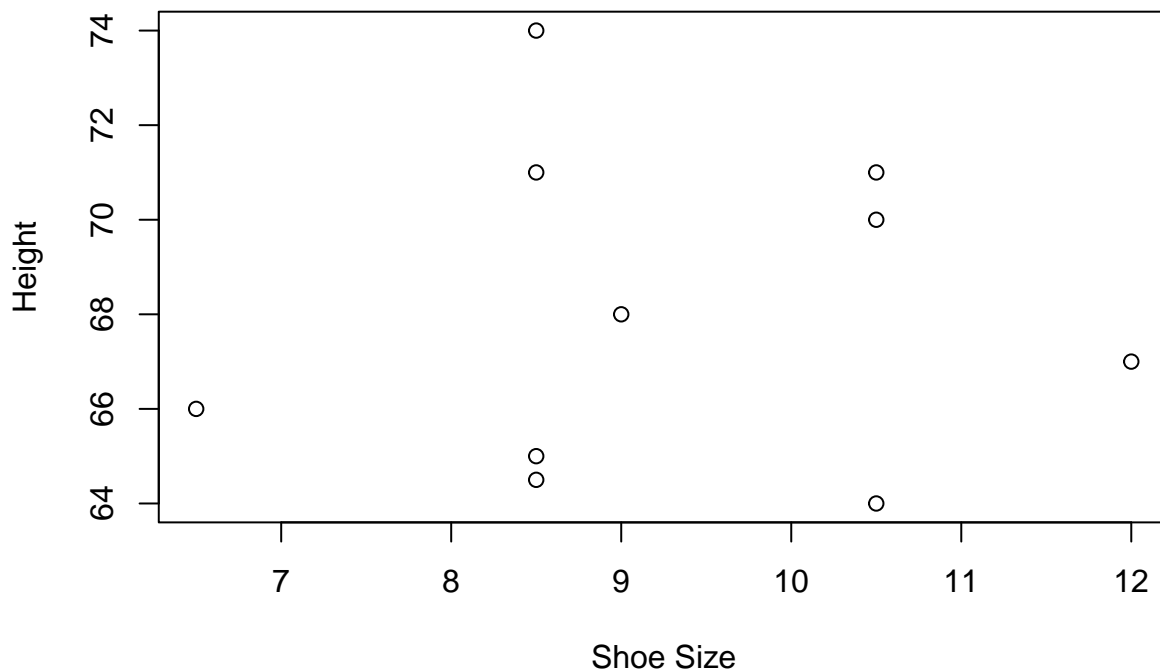
```
mean(df$Height)
```

```
## [1] 68.05
```

```
# 68.05
```

```
#D.
```

```
plot(df$ShoeSize, df$Height, xlab="Shoe Size", ylab="Height")
```



```
#2
```

```
months_vector <- c("March", "April", "January", "November", "January",  
                  "September", "October", "September", "November", "August",  
                  "January", "November", "November", "February", "May", "August",  
                  "July", "December", "August", "August", "September", "November", "February", "April")
```

```
factor_months_vector <- factor(months_vector)
```

```
print(factor_months_vector)
```

```
## [1] March    April     January  November January  September October  
## [8] September November  August   January  November November  February  
## [15] May      August   July     December August   August   September  
## [22] November February April  
## 11 Levels: April August December February January July March May ... September
```

```
#3
```

```
summary(months_vector)
```

```
##      Length      Class      Mode  
##         24 character character
```

```
# Length      Class      Mode
#      24 character character

summary(factor_months_vector)

##      April      August  December  February  January      July      March      May
##          2          4          1          2          3          1          1          1
## November  October September
##          5          1          3

# April      August  December  February  January      July      March      May  November  October September
#          2          4          1          2          3          1          1          1          4          1
# There are 12 unique month names in the months_vector, whereas there are 11 unique levels in factor_months_vector
# In this case, the factor vector is more useful as it allows for easier analysis of the frequency of each month
```

#4

```
direction_vector <- c("East", "West", "North")
frequency_vector <- c(1,4,3)

factor_data <- factor(direction_vector, levels = c("East", "West", "North"))
new_order_data <- factor(factor_data, levels = c("East", "West", "North"))

print(factor_data)
```

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

```
print(new_order_data)
```

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

#5

```
#A
student_table <- read.table(file = 'import_march.csv', header = TRUE, sep = ',')
student_table
```

```
##      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.

```
random_number <- sample(1:50, 1)

cat("The chosen number is:", random_number, "\n")

## The chosen number is: 8

if (random_number == 20) {
  cat("TRUE\n")
} else if (random_number < 1 || random_number > 50) {
  cat("The number selected is beyond the range of 1 to 50\n")
}
```

```

} else {
  cat(random_number, "\n")
}

```

8

#7.

```

calculate_min_bills <- function(price_of_snack) {
  bill_denominations <- c(1000, 500, 200, 100, 50)
  total_bills <- 0

  for (bill in bill_denominations) {
    num_bills_needed <- price_of_snack %/% bill
    price_of_snack <- price_of_snack %% bill
    total_bills <- total_bills + num_bills_needed
  }

  cat("Minimum number of bills needed to purchase the snack:", total_bills, "\n")
}

price_of_snack <- 1350
calculate_min_bills(price_of_snack)

```

Minimum number of bills needed to purchase the snack: 4

#8. #A.2

```

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

```

```

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

```

#B.

```

students$Average <- (students$Grade1 + students$Grade2 + students$Grade3 + students$Grade4) / 4

for (i in 1:nrow(students)) {
  average <- (students$Grade1[i] + students$Grade2[i] + students$Grade3[i] + students$Grade4[i]) / 4
  count <- 0
  total_average <- 0
  if (students$Grade4[i] > 90) {
    cat(students$Name[i], "'s average grade this semester is", average, ".\n")
    total_average <- total_average + average
    count <- count + 1
  }
}

```

```

## Annie 's average grade this semester is 83.75 .
if (count > 0) {
  overall_average <- total_average / count
  cat("The overall average for high-achieving students is", overall_average, ".\n")
} else {
  cat("No high-achieving students found.\n")
}

## No high-achieving students found.

#C.
test1_average <- sum(students$Grade1) / nrow(students)
test2_average <- sum(students$Grade2) / nrow(students)
test3_average <- sum(students$Grade3) / nrow(students)
test4_average <- sum(students$Grade4) / nrow(students)

if (test1_average < 80) {
  cat("The 1st test was difficult.\n")
}
if (test2_average < 80) {
  cat("The 2nd test was difficult.\n")
}

## The 2nd test was difficult.
if (test3_average < 80) {
  cat("The 3rd test was difficult.\n")
}
if (test4_average < 80) {
  cat("The 4th test was difficult.\n")
}

#D.
for (i in 1:nrow(students)) {
  highest_grade <- students$Grade1[i]
  if (students$Grade2[i] > highest_grade) {
    highest_grade <- students$Grade2[i]
  }
  if (students$Grade3[i] > highest_grade) {
    highest_grade <- students$Grade3[i]
  }
  if (students$Grade4[i] > highest_grade) {
    highest_grade <- students$Grade4[i]
  }
  if (highest_grade > 90) {
    cat(students$Name[i], "'s highest grade this semester is", highest_grade, "\n")
  }
}

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

```