

RWorksheet#4A_Sapan

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#1.

```
shoe_df <- data.frame(  
  shoe_size = c(6.5,9.0,8.5,8.5,10.5,7.5,9.5,10.0,13.0,7.5,  
                10.5,8.5,12.0,10.5,13.0,11.5,8.5,5.0,10.0,  
                6.5,8.5,10.5,8.5,11.0,10.5,9.0,13.0),  
  height = c(66.0,68.0,64.5,65.0,70.0,74.0,70.0,71.0,74.0,  
             72.0,74.5,67.0,71.0,71.0,77.0,72.0,59.0,62.0,  
             72.0,64.0,67.0,69.0,73.0,72.0,72.0,69.0,70.0),  
  gender = c("F","F","F","F","M","M","F","F","M","F","F","F",  
             "M","M","M","M","F","F","M","F","F","M","M","M",  
             "M","M","M")  
)
```

#a.

```
str(shoe_df)  
summary(shoe_df)
```

#b.

```
male_subset <- subset(shoe_df, gender == "M",  
                      select = c(shoe_size, height))  
female_subset <- subset(shoe_df, gender == "F",  
                       select = c(shoe_size, height))
```

```
male_subset  
female_subset
```

#c.

```
mean_shoe_size <- mean(shoe_df$shoe_size)  
mean_height <- mean(shoe_df$height)
```

```
mean_shoe_size  
mean_height
```

#d.

```
correlation_value <- cor(shoe_df$shoe_size, shoe_df$height)  
correlation_value
```

#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")
```

```
months_factor <- factor(months_vector)  
months_factor
```

#3.

```
summary(months_vector)  
summary(months_factor)
```

#4.

```
direction_vector <- c("East", "West", "West", "West", "West",  
                    "North", "North", "North", "East")  
  
direction_factor <- factor(direction_vector,  
                          levels = c("East", "West", "North"))  
  
print(direction_factor)
```

#5.

#a.

```
import_march <- data.frame(  
  Students = c("Male", "Male", "Male", "Female", "Female", "Female"),  
  Strategy1 = c(8, 4, 0, 14, 10, 6),  
  Strategy2 = c(10, 8, 6, 4, 2, 0),  
  Strategy3 = c(8, 6, 4, 15, 12, 9)  
)  
  
write.csv(import_march, "import_march.csv", row.names = FALSE)
```

#b

```
View(import_march)
print(import_march)
```

#6.

#a

```
selected_number <- as.integer(
  readline(prompt = "Enter a number from 1 to 50: ")
)

if (is.na(selected_number)) {
  cat("Invalid input. Please enter a number.\n")
} else if (selected_number < 1 || selected_number > 50) {
  cat("The number selected is beyond the range of 1 to 50\n")
} else if (selected_number == 20) {
  cat("TRUE\n")
} else {
  cat("You entered:", selected_number, "\n")
}
```

#7.

```
snack_price <- as.integer(
  readline(prompt = "Enter the price of the snack (divisible by 50): ")
)

if (snack_price %% 50 != 0 || snack_price <= 0) {
  cat("The price must be a positive number divisible by 50\n")
} else {
  bills <- c(1000, 500, 200, 100, 50)
  bill_count <- 0
  remaining_amount <- snack_price

  for (bill in bills) {
    bill_count <- bill_count + remaining_amount %% bill
    remaining_amount <- remaining_amount %% bill
  }

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

#8. STUDENT GRADES

```

student_grades <- 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)
)

print(student_grades)

#b. Average score over 90 (without rowMeans)

for (i in 1:nrow(student_grades)) {
  total_score <- student_grades[i,2] +
    student_grades[i,3] +
    student_grades[i,4] +
    student_grades[i,5]
  average_score <- total_score / 4

  if (average_score > 90) {
    cat(student_grades$name[i],
        "'s average grade this semester is",
        average_score, "\n")
  }
}

#c. Difficult tests (average < 80)

for (j in 2:5) {
  test_average <- sum(student_grades[, j]) /
    nrow(student_grades)

  if (test_average < 80) {
    cat("The", j - 1, "th test was difficult.\n")
  }
}

#d. Highest score exceeding 90

for (i in 1:nrow(student_grades)) {
  scores <- as.numeric(student_grades[i, 2:5])
  highest_score <- sort(scores, decreasing = TRUE)[1]

  if (highest_score > 90) {
    cat(student_grades$name[i],
        "'s highest grade this semester is",
        highest_score, "\n")
  }
}

```

