

SCS2211 – Laboratory (2)

Question (1)

a,b)

```
> data("rock", package = "datasets")
> summary(rock)
```

area	peri	shape	perm
Min. : 1016	Min. : 308.6	Min. : 0.09033	Min. : 6.30
1st Qu.: 5305	1st Qu.: 1414.9	1st Qu.: 0.16226	1st Qu.: 76.45
Median : 7487	Median : 2536.2	Median : 0.19886	Median : 130.50
Mean : 7188	Mean : 2682.2	Mean : 0.21811	Mean : 415.45
3rd Qu.: 8870	3rd Qu.: 3989.5	3rd Qu.: 0.26267	3rd Qu.: 777.50
Max. : 12212	Max. : 4864.2	Max. : 0.46413	Max. : 1300.00

c)

```
> mean_area <- mean(rock$area)
> sd_area <- sd(rock$area)
> n <- length(rock$area)
>
> margin_of_error <- qt(0.975, df = n - 1) * (sd_area / sqrt(n))
>
> confidence_interval <- c(mean_area - margin_of_error, mean_area + margin_of_error)
> cat("95% Confidence Interval for 'area':", confidence_interval, "\n")
95% Confidence Interval for 'area': 6408.421 7967.038
> |
```

d)

```
> test_result <- t.test(rock$area, mu = 7000, alternative = "greater")
>
> cat("Test Statistic:", test_result$statistic, "\n")
Test Statistic: 0.4846122
> cat("P-value:", test_result$p.value, "\n")
P-value: 0.3151012
```

```

> if (test_result$p.value < 0.05){
+   cat("Reject the null hypothesis. There is enough evidence to support the researcher's claim that the area of pores space is greater than 7000 pixels.\n")
+ }
+ }else{
+   cat("Fail to reject the null hypothesis. There is not enough evidence to support the researcher's claim.\n")
+ }
+ }
Fail to reject the null hypothesis. There is not enough evidence to support the researcher's claim.
>

```

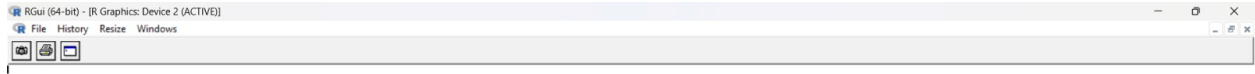
Question (2)

```

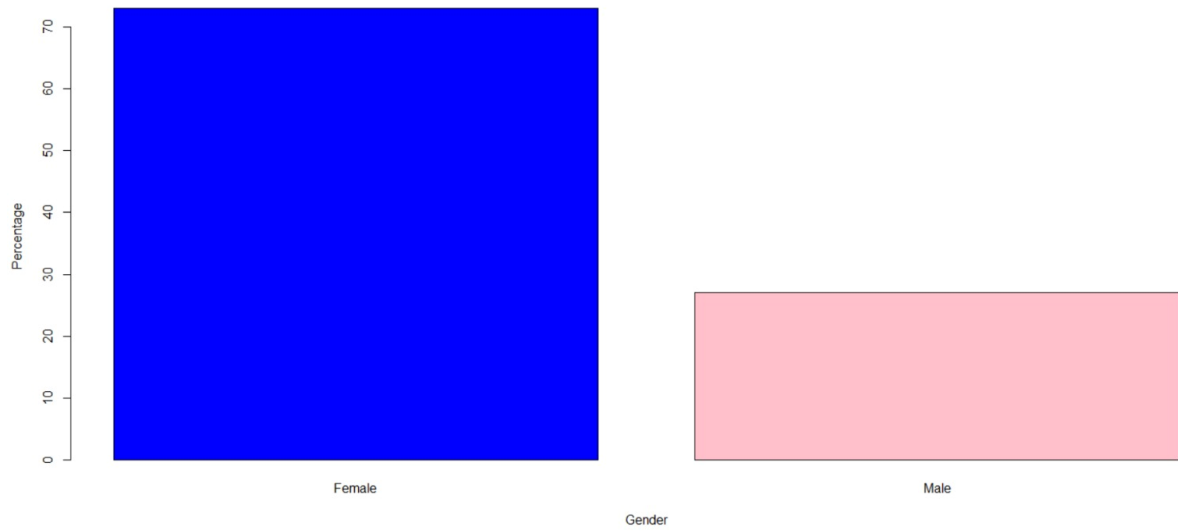
RGui (64-bit) - [R Console]
File Edit View Misc Packages Windows Help

> customer_ids <- 101:200
> gender <- sample(c("Male", "Female"), 100, replace = TRUE, prob = c(1, 3))
> shopping_frequency <- sample(c("First time", "Once a week", "Once a month"), 100, replace = TRUE, prob = c(1, 1, 2))
> satisfaction <- sample(c("Positive", "Neutral", "Negative"), 100, replace = TRUE)
> shopping_data <- data.frame(Customer_ID = customer_ids, Gender = gender, Shopping_Frequency = shopping_frequency, Satisfaction = satisfaction)
>
> head(shopping_data, 6)
  Customer_ID Gender Shopping_Frequency Satisfaction
1         101 Female      Once a week      Neutral
2         102 Male      Once a month      Neutral
3         103 Female      Once a month      Positive
4         104 Male      First time      Neutral
5         105 Male      Once a month      Negative
6         106 Female      First time      Negative
>
> tail(shopping_data, 6)
  Customer_ID Gender Shopping_Frequency Satisfaction
95         195 Female      First time      Positive
96         196 Female      Once a month      Positive
97         197 Male      Once a month      Negative
98         198 Female      Once a week      Positive
99         199 Female      Once a month      Neutral
100        200 Female      Once a week      Positive
>
>
> gender_percentage <- table(shopping_data$Gender) / length(shopping_data$Gender) * 100
>
> barplot(gender_percentage, col = c("blue", "pink"), main = "Gender Distribution of Customers at Kyoto Super", xlab = "Gender", ylab = "Percentage")
>
>
> satisfaction_percentage <- table(shopping_data$Satisfaction) / length(shopping_data$Satisfaction) * 100
>
> barplot(satisfaction_percentage, col = c("green", "gray", "red"), main = "Customer Satisfaction at Kyoto Super", xlab = "Satisfaction Level", ylab = "Percentage")
>

```



Gender Distribution of Customers at Kyoto Super



Customer Satisfaction at Kyoto Super

