

Probability and Statistics

IT24102268

Lab sheet – 10

```
7 # Question 1: Customer Distribution Test
8 cat("=== Question 1 ===\n")
9 observed <- c(55, 62, 43, 46, 50)
10 prob <- c(0.2, 0.2, 0.2, 0.2, 0.2)
11 chisq_result1 <- chisq.test(x = observed, p = prob)
12 print(chisq_result1)
13 cat("Conclusion: Since p-value > 0.05, we do not reject H0.\n")
14 cat("Customers appear to arrive with equal probability each weekday.\n\n")
15
```

=== Question 1 ===

```
> observed <- c(55, 62, 43, 46, 50)
> prob <- c(0.2, 0.2, 0.2, 0.2, 0.2)
> chisq_result1 <- chisq.test(x = observed, p = prob)
> print(chisq_result1)
```

Chi-squared test for given probabilities

data: observed

X-squared = 4.4297, df = 4, p-value = 0.351

```
> cat("Conclusion: Since p-value > 0.05, we do not reject H0.\n")
Conclusion: Since p-value > 0.05, we do not reject H0.
> cat("Customers appear to arrive with equal probability each weekday.\n\n")
Customers appear to arrive with equal probability each weekday.
```

```
15
16 # Question 2: House Tasks Association Test
17 cat("=== Question 2 ===\n")
18 file_path <- "http://www.sthda.com/sthda/RDoc/data/housetasks.txt"
19 housetasks <- read.delim(file_path, row.names = 1)
20 chisq_result2 <- chisq.test(housetasks)
21 print(chisq_result2)
22 cat("Conclusion: Since p-value < 0.05, we reject H0.\n")
23 cat("There is significant association between tasks and distribution.\n\n")
24
```

```

> # Question 2: House Tasks Association Test
> cat("=== Question 2 ===\n")
=== Question 2 ===
> file_path <- "http://www.sthda.com/sthda/RDoc/data/housetasks.txt"
> housetasks <- read.delim(file_path, row.names = 1)
> chisq_result2 <- chisq.test(housetasks)
> print(chisq_result2)

      Pearson's Chi-squared test

data:  housetasks
X-squared = 1944.5, df = 36, p-value < 2.2e-16

> cat("Conclusion: Since p-value < 0.05, we reject H0.\n")
Conclusion: Since p-value < 0.05, we reject H0.
> cat("There is significant association between tasks and distribution.\n\n")
There is significant association between tasks and distribution.

```

```

# Exercise: Snack Type Preference
cat("=== Exercise ===\n")
snack_observed <- c(120, 95, 85, 100)
snack_prob <- c(0.25, 0.25, 0.25, 0.25)
snack_chisq <- chisq.test(x = snack_observed, p = snack_prob)
print(snack_chisq)
cat("Conclusion: Since p-value > 0.05, we do not reject H0.\n")
cat("No evidence against equal preference for snack types.\n")

```

```

=== Exercise ===
> snack_observed <- c(120, 95, 85, 100)
> snack_prob <- c(0.25, 0.25, 0.25, 0.25)
> snack_chisq <- chisq.test(x = snack_observed, p = snack_prob)
> print(snack_chisq)

      Chi-squared test for given probabilities

data:  snack_observed
X-squared = 6.5, df = 3, p-value = 0.08966

> cat("Conclusion: Since p-value > 0.05, we do not reject H0.\n")
Conclusion: Since p-value > 0.05, we do not reject H0.
> cat("No evidence against equal preference for snack types.\n")
No evidence against equal preference for snack types.
> |

```