

Sri Lanka Institute of Information Technology



Lab Submission
<Lab sheet 10>

IT24104110

Thulmanthi W.A.S

IT2120- Probability and Statistics

B.Sc. (Hons) in Information Technology

Exercise

i). State the null and alternative hypotheses for the test.

- **Null Hypothesis (H_0):** Customers choose each snack type (A, B, C, D) with equal probability (i.e., 0.25 each).
- **Alternative Hypothesis (H_1):** At least one snack type is chosen with a different probability.

ii). Perform a suitable chi-squared test to test the null hypothesis.

```
1 setwd("C:\\Users\\User\\Desktop\\IT24104110")
2 getwd()
3
4 #(ii)
5 # Observed counts for each snack type
6 observed <- c(120, 95, 85, 100)
7
8 # Expected probabilities assuming equal preference
9 prob <- c(0.25, 0.25, 0.25, 0.25)
10
11 # Perform Chi-squared goodness-of-fit test
12 chisq.test(x = observed, p = prob)
13
14
```

```
> getwd()
[1] "C:/Users/User/Documents"
> #(ii)
> # Observed counts for each snack type
> observed <- c(120, 95, 85, 100)
>
> # Expected probabilities assuming equal preference
> prob <- c(0.25, 0.25, 0.25, 0.25)
>
> # Perform Chi-squared goodness-of-fit test
> chisq.test(x = observed, p = prob)
```

Chi-squared test for given probabilities

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

iii) Give your conclusions based on the results.

- **Significance Level:** 5% (0.05)
- **P-value:** 0.08966

Since the p-value (0.08966) is greater than 0.05, we **do not reject** the null hypothesis.

Conclusion: There is no statistically significant evidence to suggest that customers prefer one snack type over another. The data supports the claim that snack choices are equally likely.