

IT2120 - Probability and Statistic

Lab Sheet 10

Exercise

i)

Null hypothesis (H_0) - Customers choose all four snack types (A, B, C, D) with equal probability, ($p_A = p_B = p_C = p_D = 0.25$)

Alternative hypothesis (H_1) - At least one snack type has a different probability

ii)

```
1 setwd("C:\\Users\\Malith Kanishka\\Desktop\\IT24610814")
2 getwd()
3
4
5 # Observed frequencies
6 observed <- c(120, 95, 85, 100)
7
8 # Expected frequencies
9 total <- sum(observed)
10 expected <- rep(total / 4, 4)
11
12 # Chi-squared test
13 chisq_test <- chisq.test(observed, p = rep(1/4, 4))
14
15
16 chisq_test
17 |
```

```
> setwd("C:\\Users\\Malith Kanishka\\Desktop\\IT24610814")
> getwd()
[1] "C:/Users/Malith Kanishka/Desktop/IT24610814"
> # Observed frequencies
> observed <- c(120, 95, 85, 100)
> # Expected frequencies
> total <- sum(observed)
> expected <- rep(total / 4, 4)
> # Chi-squared test
> chisq_test <- chisq.test(observed, p = rep(1/4, 4))
> chisq_test
```

Chi-squared test for given probabilities

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

Data	
chisq_test	List of 9
Values	
expected	num [1:4] 100 100 100 100
observed	num [1:4] 120 95 85 100
total	400

iii)

If $p\text{-value} < 0.05$ - reject H_0

If $p\text{-value} \geq 0.05$ - don't reject H_0

P values is 0.08966 greater than 0.05 , so doesn't reject H_0 , there we can decide that at east one snack type has a different probability