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IT24101821

Lab 10 – PS

1)

i.

```
1  setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821")
2
3  #Question 1
4  #i
5  observed <- c(55, 62, 43, 46, 50)
6  prob <- c(.2, .2, .2, .2, .2)
7  chisq.test(x=observed, p=prob)
8
```

```
> setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821")
> #Question 1
> #i
> observed <- c(55, 62, 43, 46, 50)
> prob <- c(.2, .2, .2, .2, .2)
> chisq.test(x=observed, p=prob)

        Chi-squared test for given probabilities

data:  observed
X-squared = 4.4297, df = 4, p-value = 0.351
```

ii.

Based on the test, the shop owner's claim is likely correct. The number of customers visiting each day is essentially the same. The minor differences observed are just due to random chance, not a meaningful pattern.

2)

```
#Question 2
#i
file_path <- "http://www.sthda.com/sthda/RDoc/data/housetasks.txt"

housetasks <- read.delim(file_path, row.names = 1)
housetasks

#ii
chisq <- chisq.test(housetasks)
chisq
```

```
> #Question 2
> #i
> file_path <- "http://www.sthda.com/sthda/RDoc/data/housetasks.txt"
> housetasks <- read.delim(file_path, row.names = 1)
> housetasks
            Wife Alternating Husband Jointly
Laundry      156          14       2       4
Main_meal    124          20       5       4
Dinner        77          11       7      13
Breakfeast    82          36      15       7
Tidying       53          11       1      57
Dishes        32          24       4      53
Shopping      33          23       9      55
Official      12          46      23      15
Driving       10          51      75       3
Finances      13          13      21      66
Insurance      8           1      53      77
Repairs        0           3     160       2
Holidays       0           1       6     153
> #ii
> chisq <- chisq.test(housetasks)
> chisq

        Pearson's Chi-squared test

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

EXERCISE

01.

i.

- Null Hypothesis (H0) - The customers choose the four snack types with equal probability.

- Alternative Hypothesis (H1) - At least one of the snack type probabilities is not 0.25. In other words, the snack types are not chosen with equal probability.

ii.

```
#EXERCISE
#1
#ii
observed_counts <- c(120, 95, 85, 100)
probabilities <- c(0.25, 0.25, 0.25, 0.25)
chi_test_result <- chisq.test(x = observed_counts, p = probabilities)
print(chi_test_result)
```

```
> #EXERCISE
> #1
> #ii
> observed_counts <- c(120, 95, 85, 100)
> probabilities <- c(0.25, 0.25, 0.25, 0.25)
> chi_test_result <- chisq.test(x = observed_counts, p = probabilities)
> print(chi_test_result)

        Chi-squared test for given probabilities

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

observed	num [1:5] 55 62 43 46 50
observed_cou…	num [1:4] 120 95 85 100
prob	num [1:5] 0.2 0.2 0.2 0.2 0.2
probabilities	num [1:4] 0.25 0.25 0.25 0.25

iii.

The owner's claim that all snacks are chosen equally is likely correct. The differences in sales for each snack are small enough to be due to random chance. We don't have enough evidence to say that customers prefer one snack over the others.