IT24104172

LAB 10 – PS

1)

i.

```
> #1
> 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)

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.

observed_counts	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

Data	
chi_test_result	List of 9
chisq	List of 9
housetasks	13 obs. of 4 variables

```
> observed_counts <- c(120, 95, 85, 100)
> probabilities <- c(0.25, 0.25, 0.25, 0.25)
> #ii
> 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
```

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.