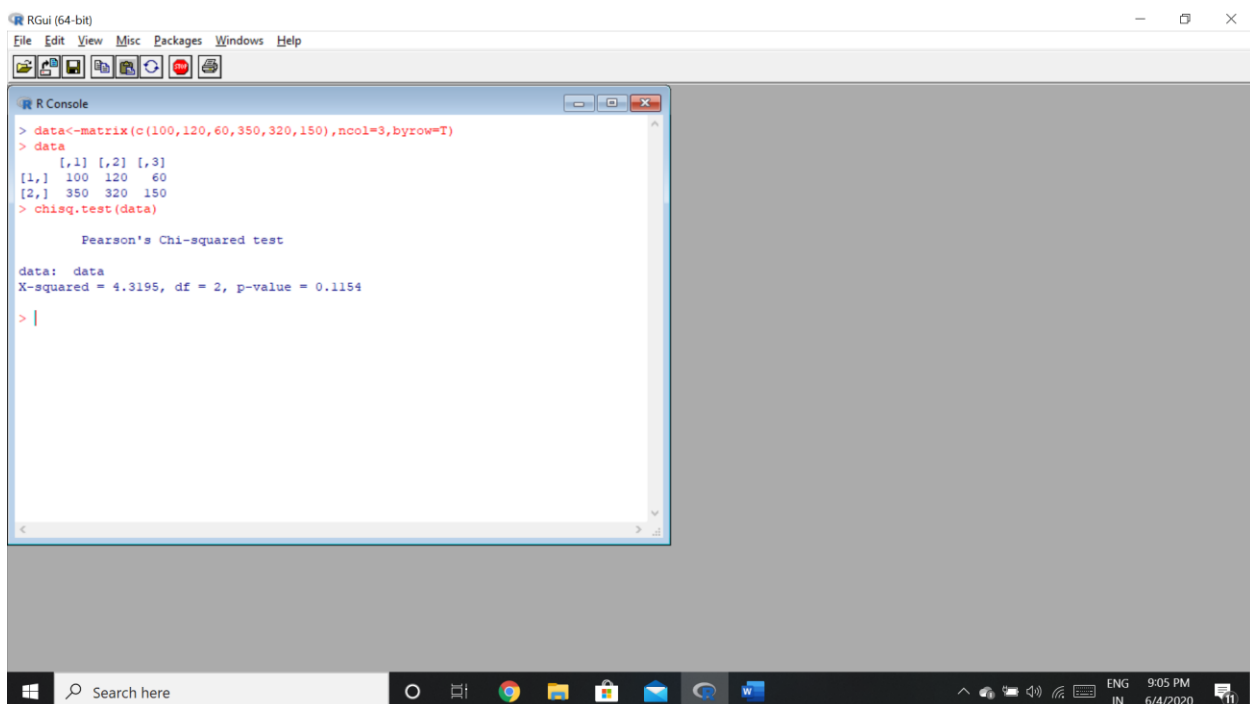**Statistics DA 6**

**Name: Kulvir Singh**

**Reg. No.: 19BCE2074**

1. The following data come from a hypothetical survey of 920 people (Men, Women) that ask for their preference of one of the three ice cream flavors (Chocolate, Vanilla, Strawberry). Is there any association between gender and preference for ice cream flavor?

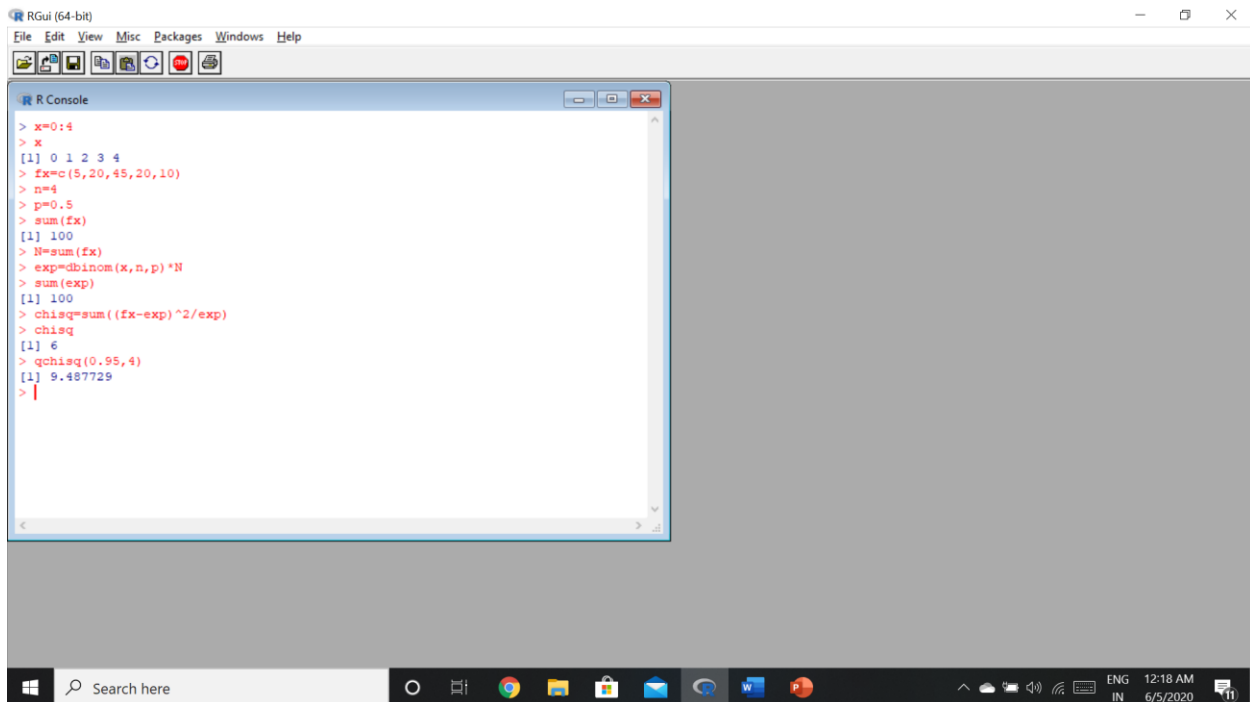| Gender\flavor | Chocolate | Vanilla | Strawberry |
|---|---|---|---|
| Men | 100 | 120 | 60 |
| Women | 350 | 320 | 150 |



Interpretation:

Here the p value is >0.05. Hence, there is no evidence for any association between gender and flavor of ice-cream. They are INDEPENDENT.

2. As a part of quality improvement project focused on a delivery of mail at a department office within a large company, data were gathered on the number of different addresses that had to be changed so that the mail could be redirected to thee correct mail stop. Table shows the frequency distribution. Fit binomial distribution and test goodness of fit

| x | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| fx | 5 | 20 | 45 | 20 | 10 |

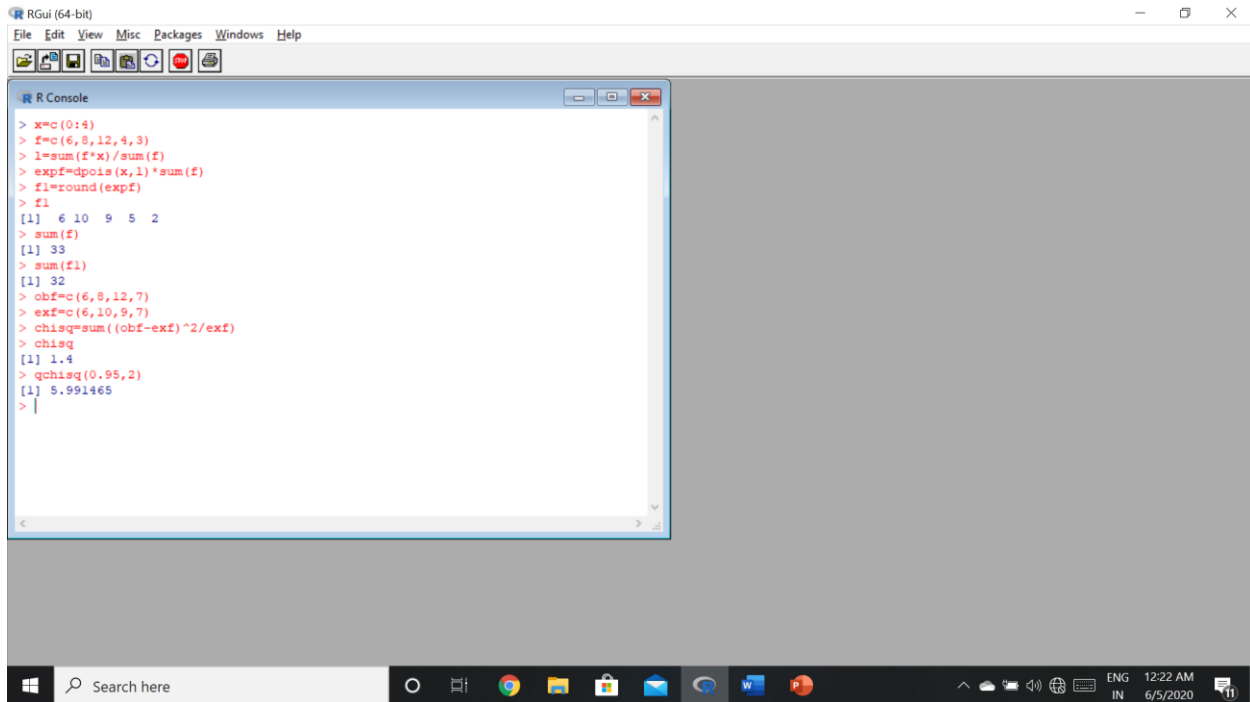**The number of Addresses Needing Change**



Interpretation:

The CV is less than table value, accept null hypothesis. The mail will be redirected to the correct mail shop.

3. A series of traps were set in line across sand dunes and the numbers of different types of insects caught in a fixed time interval are recorded to study their movement across the dune. Following table shows the data on the movement of leafhopper (Hemiptera) across a sand dune.

| Leafhopper(Hemiptera) Per trap $X_i$ | Frequency $f_i$ |
|---|---|
| 0 | 6 |
| 1 | 8 |
| 2 | 12 |
| 3 | 4 |
| 4 or more | 3 |

**Movement of Leafhopper Across a Sand Dune**

Fit Poisson distribution to the above data and test goodness of fit.



```
R RGui (64-bit)
File Edit View Misc Packages Windows Help

R R Console
> x=c(0:4)
> f=c(6,8,12,4,3)
> l=sum(f*x)/sum(f)
> expf=dpois(x,1)*sum(f)
> f1=round(expf)
> f1
[1]  6 10  9  5  2
> sum(f)
[1] 33
> sum(f1)
[1] 32
> obf=c(6,8,12,7)
> exf=c(6,10,9,7)
> chisq=sum((obf-exf)^2/exf)
> chisq
[1] 1.4
> qchisq(0.95,2)
[1] 5.991465
> |
```

Interpretation:

Since the calculated value is less than 5.991465 there fore the conclusion is that Poisson distribution is NOT good fit for the given data.