Probability and Statistics

Bandara TA.H.K – IT24100637

Lab Sheet 10

Exercise

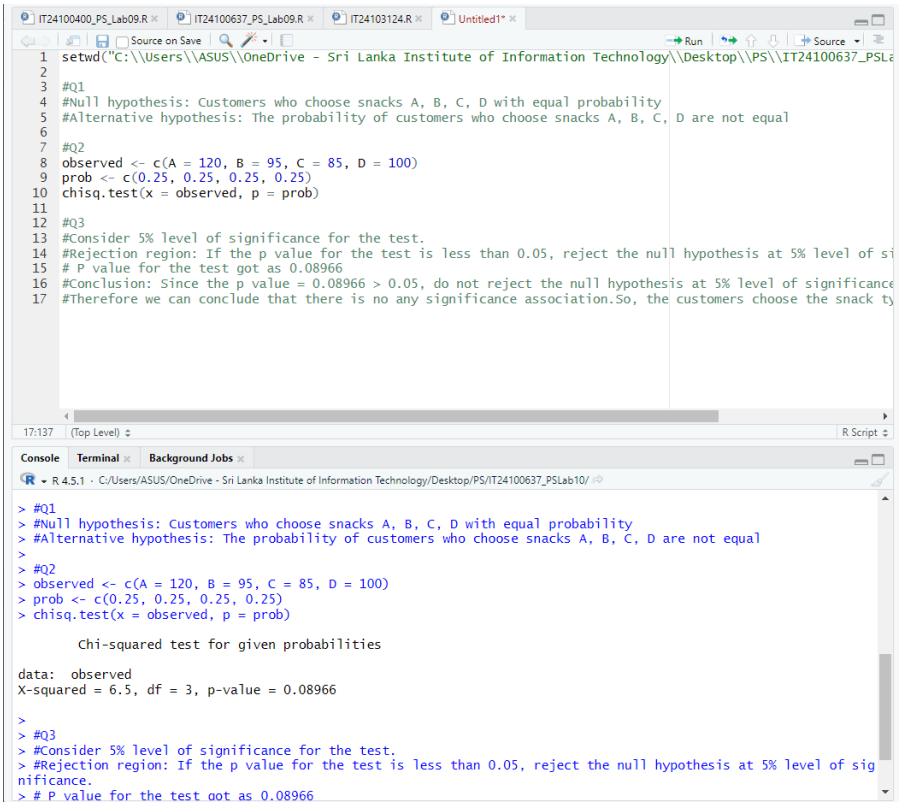
1. A vending machine owner claims that customers choose the four snack types (A, B, C, D) with equal probability. To test this claim, a researcher records the number of purchases for each snack type during one week and results are given below.

Snack_Type	Count
A	120
B	95
C	85
D	100

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

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

iii. Give your conclusions based on the results.



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setwd("C:\\Users\\ASUS\\OneDrive - Sri Lanka Institute of Information Technology\\Desktop\\PS\\IT24100637_PSLa

#Q1
#Null hypothesis: Customers who choose snacks A, B, C, D with equal probability
#Alternative hypothesis: The probability of customers who choose snacks A, B, C, D are not equal

#Q2
observed <- c(A = 120, B = 95, C = 85, D = 100)
prob <- c(0.25, 0.25, 0.25, 0.25)
chisq.test(x = observed, p = prob)

#Q3
#Consider 5% level of significance for the test.
#Rejection region: If the p value for the test is less than 0.05, reject the null hypothesis at 5% level of si
# P value for the test got as 0.08966
#Conclusion: Since the p value = 0.08966 > 0.05, do not reject the null hypothesis at 5% level of significance
#Therefore we can conclude that there is no any significance association.So, the customers choose the snack ty
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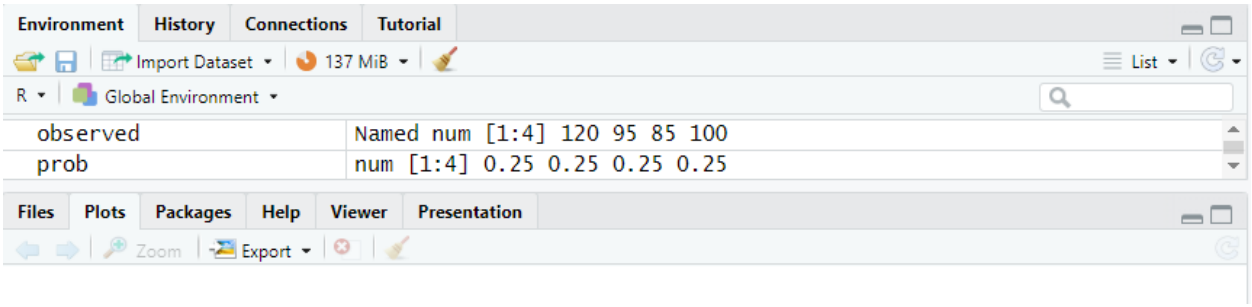
```
> #Q1
> #Null hypothesis: Customers who choose snacks A, B, C, D with equal probability
> #Alternative hypothesis: The probability of customers who choose snacks A, B, C, D are not equal
>
> #Q2
> observed <- c(A = 120, B = 95, C = 85, D = 100)
> prob <- c(0.25, 0.25, 0.25, 0.25)
> chisq.test(x = observed, p = prob)

        Chi-squared test for given probabilities

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

>
> #Q3
> #Consider 5% level of significance for the test.
> #Rejection region: If the p value for the test is less than 0.05, reject the null hypothesis at 5% level of sig
nificance.
> # P value for the test got as 0.08966
```


Environment
History
Connections
Tutorial
Import Dataset
137 MiB
List
R
Global Environment
observed
Named num [1:4] 120 95 85 100
prob
num [1:4] 0.25 0.25 0.25 0.25
Files
Plots
Packages
Help
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Presentation
Zoom
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