Homework 10

Priyanka Mahendra Ghare

November 6, 2022

2. X2 testing for independence between categorical variables

```
Possible Gene Types:['J', 'R', 'K']

Contingency table:
       No Cancer  Has Cancer
Gene
J              93          37  130
K              34           5   39
R              20           1   21
Total         147          43  190

Conditional proportions table:
      No Cancer Has Cancer row_marginal_per
Gene
J         71.5%      28.5%            68.4%
K         87.2%      12.8%            20.5%
R         95.2%       4.8%            11.1%
Total     77.4%      22.6%           100.0%

Expected counts table:
        No Cancer Has Cancer  Total
Gene
J      100.578947  29.421053  130.0
K       30.173684   8.826316   39.0
R       16.247368   4.752632   21.0
Total       77.4%      22.6%

 X^2 = 8.50
Degree of freedom = 2
P-value = 0.0143
```

We reject the null hypothesis that the gene and cancer are independent because the

p-value is less than 0.05. Therefore, it would seem extremely unlikely that the gene and cancer are independent.