3.4 Chi-Square test of independence

A Chi-Square independence Test was performed to determine whether the proportion of gender who are more affected to diabetes than other –
From the dataset table we have can see that there is-
N=398

α = 0.05

H_0**=In general men have better chances of getting affected by diabetes than female**
H_1**= In general men don't have better chances of getting affected by diabetes than female**

Observed table:

Gender	Diabetes affected(0)	Diabetes not affected (1)
Male (1)	110	83
Female(2)	126	79

Df value is 1
So chi-square value is – 3.841

Expected table formula:

$$f_e = \frac{f_c f_r}{n}$$

Expected table:

Gender	Diabetes affected(0)	Diabetes not affected (1)
Male(1)	114.44	78.55
Female(2)	121.55	83.44

Chi-square formula:

$$\chi^2 = \sum \frac{(\text{O-E})^2}{\text{E}}$$

Test statistic value is < critical value and it doesn't fall within the critical region .

Thus we fail to reject H_0.

Data Calculation:

```
> tbl = table(Dataset$gendera, Dataset$diabetes)
> source("H:/semester 2/PROBABILITY AND STATISTICAL DATA/Final project/PSDA final project/PSDA final.R")
> library(MASS)
> Dataset <- read_excel("H:/semester 2/PROBABILITY AND STATISTICAL DATA/Final project/Dataset.xlsx")
> View(Dataset)
> tbl = table(Dataset$gendera, Dataset$diabetes)
> tbl

     0   1
  1 110  83
  2 126  79
> chisq.test(tbl, correct = FALSE)

        Pearson's Chi-squared test

data:  tbl
X-squared = 0.82245, df = 1, p-value = 0.3645

> #critical_value
> alpha <- 0.05
> x2.alpha <- qchisq(alpha, df = 1, lower.tail = FALSE)
> x2.alpha
[1] 3.841459
>
```

All the data and values and equations have been calculated using R - Script. The photo stated above is from the R console which shows the data calculation for this chi-square