Summary

- The statistic whose approximate sampling distribution was derived by a British statistician named Karl Pearson in 1900 is called the Chi-Square (or sometimes Pearson's Chi- square) statistic

- A powerful test for testing the discrepancy between theory and experiment was given by Karl Pearson and is known as Chi-square test of goodness of fit.

- The Pearson's statistic of goodness of fit is given by

  $\chi^2 = \frac{\sum_i (Oi - Ei)^2}{E_i}$ and is compared to the critical value of significance from the Chi square distribution where Oi are the observed frequencies and Ei's are the expected frequencies obtained from the knowledge of the population

- Under the hypothesis that the theoretical distribution fits well the statistic is distributed as a Chi square variable with (n-p-1) degrees of freedom where n is the number of cell frequencies, p is the number parameters estimated

- A Chi-square test is designed to analyze categorical data