Summary

- Nonparametric tests do not make assumptions that the population is from a specific distribution. Therefore its results are more robust than a parametric test when such assumptions are violated.
- Nonparametric tests are often used in place of their parametric counterparts when certain assumptions about the underlying population are questionable.
- The sign test is the simplest of the nonparametric tests, and is similar to testing if a two-sided coin is fair. Its name comes from the fact that it is based on the direction (or signs for pluses and minuses) of a pair of observations and not on their numerical magnitude.
- The One Sample Sign Test is a nonparametric equivalent to the parametric One Sample t-Test.

- The one-sample sign test is used to test the null hypothesis that the probability of a random value from the population being above the specified value is equal to the probability of a random value being below the specified value.
- Sign test make null hypothesis about true median
- If null hypothesis is true, S should have binomial distribution with success probability .5
- To test H0:M=M0 against the alternative hypothesis H1: M≠M0 where M0 is the given value of the population median, Compute $P(X \leq U) = \sum^{U} n_{c_x} (\frac{1}{2})^x (\frac{1}{2})^{n-x}$ and this value is compared with α/2, the level of significance. If the calculated value of P(X≤U) is less than the predicted α/2, the null hypothesis is rejected where U is the number of positive signs
- If n≥25, the value of Z is computed and the normal test is applied to decide about H0 where

$$Z = \frac{(U+0.5) - np_0}{\sqrt{np_0(1-p_0)}}$$ when $U<np_0$

$$Z = \frac{(U-0.5) - np_0}{\sqrt{np_0(1-p_0)}}$$ when $U>np_0$ where $p_0 = 0.5$