Answer on question 41769 – Math – Statistics and Probability

The values below are the scores (maximum 20) obtained in an aptitude test by a random sample of 11 graduates. it is known that for the non-graduate population the median score is 12. Is there evidence, at the 10% significance level, that graduates achieve a higher median score than the non-graduate population?

14 15 09 10 10 13 14 19 12 16 13

Answer

$H_0: \eta = 12$

$H_1: \eta > 12$ (one tailed)

Signs of (score-12) are

$$+ \quad + \quad - \quad - \quad - \quad + \quad + \quad + \quad 0 \quad + \quad +$$

Let X denote the number of + signs. Then, ignoring the one 0 in this case, under H_0,

$$X \sim B(10, 0.5) \text{ with observed value of } X = 7.$$

Now

$$P(X \geq 7) = 1 - P(X \leq 6) = 1 - 0.8281 = 0.1719 > 0.1$$

Thus there is no evidence, at the 10% level for significance, to suggest that graduates achieve a higher median score than the non-graduate population.