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| **One Sample Run Test:**  The runs test (Bradley, 1968) can be used to decide if a data set is from a random process. Run test is a statistical test used to determine of the data obtained from a sample is random. That is why it is called Run Test for Randomness. The runs test examines the arrangement of numbers in a sequence to test the hypothesis of independence. A run is a sequence of similar or like events, items or symbols that is preceded by and followed by an event, item or symbol of a different type,  or by none at all.  E.g. in a sequence of tosses of a coin, we may have H T T H H T T T H T  This sequence has six runs, first with a length of one, second and third with length two, fourth length three, fifth and sixth length one.  **Importance of a Runs Test**  The runs test model is important in determining whether an outcome of a trial is truly random, especially in cases where random versus sequential data has implications for subsequent theories and analysis.  **Working Procedure**   1. State the null and alternative hypothesis   H0: Sequence is random  H1: Sequence is not random   1. Choose LOS 2. r=number of runs   n = total sample size n1 = the number of observation of one type n2 = the number of observations of the other type   1. Calculate mean of the r statistic      1. Calculate standard error of r ststistics      1. Calculate      1. Conclusion: 2. If z value< ztab, accept null hypothesis. 3. If z value> ztab, reject null hypothesis. |
| 1. The following is an arrangement of 25 men M and 15 women W lined up to purchase tickets for a premier movie show:   M WW MMM W MM W M W M WWW MMM W MM WWW MMMMMM WWW MMMMMM  Test for randomness at the 5 % LOS.   1. A stock broker is interested to know whether the daily movement of a particular share averages in the stock market showed a pattern of movement or whether these movements were purely random. For 14 business days he noted the value of this average and compared it with the value at the close of the previous day. He noted the increase as plus + and decrease as minus -. The record was as follows:   ++ -- +++ - ++ - + --  Test whether the distribution of these movement is random or not at 5% LOS.   1. Some items produced by a machine are defective. If the machine follows some pattern where defective items are not randomly produced throughout the process the machine needs to be adjusted. A quality control engineer wants to determine whether the sequence of defective D versus good G items is random. The data are:   GGGG DDD GGGGGG DDD GGGGGGGGGG DDDD GGGGGGGGGGG DDD GGGGGGGGGGG DDDD  Test whether the distribution of defective and good items is random or not at 5% LOS. |