

11. Stock Market: Testing for Randomness Above and Below the Median Listed below are the annual high values of the Dow Jones Industrial Average for a recent sequence of years (as of this writing). Test for randomness below and above the median. What does the result suggest about the stock market as an investment consideration?

969 995 943 985 969 842 951 1036 1052 892 882 1015
 1000 908 898 1000 1024 1071 1287 1287 1553 1956 2722 2184
 2791 3000 3169 3413 3794 3978 5216 6561 8259 9374 11568 11401
 11350 10635 10454 10855 10941 12464 14198 13279 10580 11625

12. Global Warming Listed below are global mean temperatures ($^{\circ}\text{C}$) of the earth for 50 recent and consecutive years (based on data from the Goddard Institute for Space Studies). Test for randomness above and below the mean. What do the results suggest about global warming?

13.98 14.10 14.05 14.03 13.65 13.75 13.93 13.98 13.91 14.00
 14.04 13.90 13.95 14.18 13.94 13.98 13.79 14.16 14.07 14.13
 14.27 14.40 14.10 14.34 14.16 14.13 14.19 14.35 14.42 14.28
 14.49 14.44 14.16 14.18 14.31 14.47 14.36 14.40 14.71 14.44
 14.41 14.56 14.70 14.64 14.60 14.77 14.64 14.66 14.68 14.70

13.7 Beyond the Basics

13. Finding Critical Values

- Using all of the elements A, A, A, B, B, B, B, B, B, list the 84 different possible sequences.
- Find the number of runs for each of the 84 sequences.
- Use the results from parts (a) and (b) to find your own critical values for G .
- Compare your results to those given in Table A-10.

Chapter 13 Review

This chapter introduced six different nonparametric tests, which are also called distribution-free tests because they do not require that the populations have a particular distribution, such as a normal distribution. Nonparametric tests are not as efficient as parametric tests, so we generally need stronger evidence before we reject a null hypothesis.

Table 13-9 lists the nonparametric tests presented in this chapter, along with their functions. The table also lists the corresponding parametric tests.

Table 13-9 Summary of Nonparametric Tests

| | Function | Parametric Test |
|--------------------------|---|------------------------------------|
| Sign test (Section 13-2) | Test for claimed value of average with one sample | t test or z test (Section 8-4) |
| | Test of differences between matched pairs | t test (Section 9-4) |
| | Test for claimed value of a proportion | z test (Section 8-3) |

continued