THE RUNS TEST

1- Represented in the data is the daily performance of a popular stock. Letter A represents a gain and letter B represents a loss. Use a runs test to analyze the stock's performance for randomness. Set $\alpha = 0.05$. Report the results.

<div align="center">BAABBAABBBBBBAABAAAAB</div>

2- A machine on an automated assembly line produces a unique type of bolt. If the machine fails more than three times in an hour, the total production on the line is slowed down. The machine has often exceeded the number of acceptable failures for the last week. The machine is expensive and more cost-effective to repair, but the maintenance crew cannot find the problem. The plant manager asks you to determine if the failure rates are random or if a pattern exists. Table 1 shows the number of failures per hour for a 24-h period.

TABLE 1

Hour	Number of failures
1	6
2	4
3	2
4	2
5	7
6	5
7	7
8	9
9	2
10	0
11	0
12	0
13	7
14	6
15	5
16	9
17	1
18	0
19	1
20	8
21	5
22	9
23	4
24	5

Use a runs test with a custom value of 3.1 to analyze the acceptable/unacceptable failure rate for randomness. Set $\alpha = 0.05$. Report the results.