1. Is it possible to exchange numeric values of two variables, say, U and V, without using any extra storage?

2. Is it a good idea to write a program that plays the classic game of tic-tactoe with the human user by storing all possible positions on the game’s $3 \times 3$ board along with the best move for each of them?

3. Apply Horspool’s algorithm to search for the pattern BAOBAB in the text BESS_KNEW_ABOUT_BAOBAB5
4. How many character comparisons will be made by Horspool’s algorithm in searching for each of the following patterns in the binary text of 1000 zeros?
   a. 00001
   b. 10000

5. For the input 30, 20, 56, 75, 31, 19 and hash function \( h(K) = K \mod 11 \)
   a. construct the linear hash table.
   b. find the largest number of key comparisons in a successful search in this table.
   c. find the average number of key comparisons in a successful search in this table.
6. For the input 30, 20, 56, 75, 31, 19 and hash function h(K) = K mod 11
   a. construct the chained hash table.
   b. find the largest number of key comparisons in a successful search in this table.
   c. find the average number of key comparisons in a successful search in this table.

7. Why is it not a good idea for a hash function to depend on just one letter (say, the first one) of a natural-language word?