MASM Questions

1. Write an MASM program to transfer a block of 10 data bytes from one memory location, 3000H, to another memory location, 4000H. Before transfer, multiply 5, then add 10 to each element.

2. Write an MASM program to store an array of 20 numbers in zig-zag (alternating less than and greater than) order in memory location 4000H.

3. Write an MASM program to convert a hexadecimal number into its equivalent ASCII.

4. Write an MASM program to implement a basic calculator for arithmetic operations.

5. Implement a library of string operations using assembly.

   (a) STRLEN: Return length of string
   (b) STRCMP: Compare two strings
   (c) STRREV: Reverse string in place

6. Write a MASM program that accepts an infix expression like $5+3*(2-1)$. Then convert it into its equivalent prefix and postfix expression only. Next, evaluate the postfix expression using stack. Print the prefix and postfix expression only.

7. Implement a MASM program for Binary Search using iteration and recursion strategy.

8. Simulate a stack using a memory buffer in MASM to handle PUSH and POP manually.

9. Take two 2D matrices as input. Now, perform addition, subtraction, and multiplication and store the result.

10. Write a program in MASM to find the number of repeated substrings present in an input string. Example: input string: `abcaabccbaaabcabcabccab`, substring to find: `abc`, output: 4

11. Write a MASM program that takes a string input from the user and converts it:

    (a) All lowercase letters to uppercase
    (b) All uppercase letters to lowercase
    (c) Display both the original and modified strings

12. Develop an MASM program that:

    (a) Accesses the system's real-time clock using BIOS INTERRUPT 1Ah.
    (b) Continuously displays the current time in HH:MM:SS format
    (c) Updates every second

13. Develop an assembly program using MASM that monitors key presses in real-time and performs the following:

    (a) Counts the number of vowels and consonants typed.
    (b) Maintains a frequency count of each key pressed.
    (c) Displays the last N characters typed (buffered view).

14. Write a MASM program to read a text file, count total characters, words, and lines, then write the counts to a new file.

15. Write a MASM program that reads a text file containing 100 distinct numbers (from 1 to 100). Then, check whether each number is prime or not. If a number is prime, store it in a separate text file.