Digital Assignment-1

Instructions:

The DA file should be uploaded with the following contents:

- **The algorithm / the pseudocode**
- **Copy of the .c file of each program**
- **Test cases:**
  - **Each test case should contain the input and the corresponding output of the program.**
  - **Copy the screen shot of each test case after your program execution.**

1. Consider the following set of strings : $\{a^n b^n | n>0\}$. Write a program using the stack to recognize such strings.

   Case-1:

   Input: aabb

   Output: This string satisfies the given pattern

   Case-2:

   Input: abab

   Output: This string dos not satisfy the given pattern

2. Write a C program to print the following pattern. Given the input as number of rows and symbols, the pattern should be printed with following symbols.
   Input: Number of rows= 5
   Symbols: @,#
   Output:

```
    @
  #   #   #
@   @   @   @   @
  #   #   #
    @
```

   Note: Number of rows should be odd number. Throw the exception if the even number input is given by the user.

3. Write a program to determine whether the given string satisfies the pattern given in the language or not using a stack.
   Language=$\{w | w \in \{a,b\}^* | a^n b^n, n>0\}$

Input: aabb
Output: The given strings belongs to the given language

Input: aaabb
Output: The string does not belong to the given language

4. Write a program to convert the given infix string to postfix string using stack.

   Input: (a+b)*c

   Output: ab+c*

5. Write a program to implement the following queue structure:
   Create a Queue of characters such that if the current character to be enqueued is alphabetically higher than the existing characters then displace the elements of the queue such that the current character fits into a right position. List out the number of displacements done to position each character and total number of displacements carried to arrange the characters in the given fashion.

   Input: enque A
   Output: A
   Input: Enque N
   Output: N A
   Input: F (Enqueue)
   Output: N F A

   Input: Deque
   Output: N F

Evaluation Criterion (for each question):

Algorithm/ Pseudocode -5M

Code - 10M

Test Cases (4) -5M