Department of Computer Science and Engineering,
Anna University, Chennai- 600025
CS6104 – Data Structures and Algorithms (R 2018)
Practical
August – December 2023
Year/Sem/Batch : II/III/ P

Exercise: 04	Stack and its Applications	21 – Sep- 2023

Observation (5 Marks)

1. Write a program to check whether the given string is of the following form, using appropriate data structure. Also validate the given string
   a. a^nb^n, n>=1where always 'a' precedes 'b'.
   b. X^nY^{n+1}, n>=1 where always 'X' precedes 'Y'
   c. $A^{n+1}B^n$, n>=1 where always 'A' precedes 'B'.
   d. 0^n1^m, n>m, where always '0' precedes '1'
   e. b^na^m, n<m where always 'b' precedes 'a'
   f. a^nb^n, n>=1 where always 'a' precedes 'b'.
   g. X^nY^{n+1}, n>=1, where always 'X' precedes 'Y'
   h. $A^{n+1}B^n$, n >=1 where always 'A' precedes 'B'.
   i. 0^n1^m, n>m where always '0' precedes '1
   j. b^na^m, n<m where always 'b' precedes 'a'.

Execution (15 Marks)

2. Construct a Stack of integers of size 25 using array and perform the following operations:
   a. Insert Fibonacci series into the stack till there is space.
   b. Print the Fibonacci series from the stack
   c. Modify the program to issue warning and exit if any attempt to pop an empty stack or push onto a full one.
3. Construct a stack to handle character sequence. In the input sequence as given below, if letter comes insert it into the stack but if an asterisk comes do pop operation. Give the sequence of values returned by the pop operation when this sequence of operations is performed on an initially empty stack. E A S * Y * Q U E * * * S T * I O * N * * *
4. Write a program to check whether the given string is of the following form, using appropriate data structure. Also validate the given string
   a. a^nb^n, n>=1 where always 'a' precedes 'b'.
   b. X^nY^{n+1}, n>=1, where always 'X' precedes 'Y'
   c. $A^{n+1}B^n$, n >=1 where always 'A' precedes 'B'.
   d. 0^n1^m, n>m where always '0' precedes '1
   e. b^na^m, n<m where always 'b' precedes 'a'.