1. **Two stacks in one array:**

Create a data structure twoStacks that represents two stacks. Implementation of twoStacks should use only one array, i.e., both stacks should use the same array for storing elements. Following functions must be supported by twoStacks.

push1(int x) –> pushes x to first stack

push2(int x) –> pushes x to second stack

pop1() –> pops an element from first stack and return the popped element

pop2() –> pops an element from second stack and return the popped element

**Implementation of twoStack should be space efficient.**

2. **Check for balanced parentheses in an expression**

Given an expression string exp , write a program to examine whether the pairs and the orders of "{","}","(",")","[","]" are correct in exp. For example, the program should print true for exp = "[()]{}{[()()]()}" and false for exp = "[(])"

3. **Reverse a string using stack**

Given a string, reverse it using stack. For example "Data Structures" should be converted to "serutcurtS ataD".

4 **Convert a base 10 integer value to base 2**