National Institute of Technology Silchar

Semester: 3rd. Branch: CSE

Data Structures Lab :: ***Assignment 2***

Date: 10/8/2018 Submission due: August 17, 2018

1. Show how to implement a stack of integers in C by using an array int s[STACKSIZE], where s[0] is used to contain the index of the top element of the stack, and where s[1] through s[STACKSIZE - 1] contain the elements on the stack. Write a declaration and routines pop, push, empty, popandtest, stacktop, pushandtest for this implementation.

2. Implement a stack in C in which each item on the stack is a varying number of integers. Choose

a C data structure for such a stack and design push and pop routines for it.

3. Consider a language that does not have arrays but does have stacks as a data type.

That is one can declare

stack s;

and the push, pop, popandtest, and stacktop operations are defined. Show how a one-dimensional array can be implemented by using these operations on two stacks.

4. Design a method for keeping two stacks within a single linear array S[spacesize] so that neither stack overflows until all of memory is used and an entire stack is never shifted to a different location within the array. Write C routines push1, push2, pop1, and pop2 to manipulate the two stacks.