Policies for Submission and Evaluation

You must submit your assignment in the moodle (eduserver) course page, on or before the submission deadline **(Jan 8th 12.00 PM)**. Your submission will also be tested for plagiarism, by automated tools. In case your code fails to pass the test, you will be straightaway awarded F grade in the course. Detection of ANY malpractice regarding the lab course will also lead to awarding an F grade.

Naming Conventions for submission:

Submit a single ZIP (.zip) file (do not submit in any other archived formats like .rar or .tar.gz). The name of this file must be **AS<Number>_<ROLLNO>_<FIRST_Name>.zip** (For example: AS1_M190038CA_Abhishek.zip). DO NOT add any other files except your source code (like temporary files, input files, etc.), into the zip archive. If there is a part 'a' and a part 'b' for a particular question, then, name the source files for each part separately as in AS1_M190038CA_Abhishek_1b.c

If you do not conform to the above naming conventions, your submission might not be recognised by some automated tools, and hence will lead to a score of 0 for the submission. So, make sure that you follow the naming conventions.

Standard of Conduct

Violations of academic integrity will be severely penalised. Each student is expected to adhere to high standards of ethical conduct, especially those related to cheating and plagiarism. Any submitted work MUST BE an individual effort. Any academic dishonesty will result in zero marks in the corresponding exam or evaluation and will be reported to the department council for record keeping and for permission to assign F grade in the course. The department policy on academic integrity can be found at:

http://minerva.nitc.ac.in/cse/sites/default/files/attachments/news/Academic-Integrity.pdf

Assignment 1 Questions

1. An *array* is a type of data structure that stores elements of the same type in a contiguous block of memory. In an array, A , of size N , each memory location has some unique index, i(where 0<=i<N), that can be referenced as A[i](you may also see it written as A_i).
(i) Given an array, A , N of integers, print each element in reverse order as a single line of space separated integers.
(ii) Write a program to perform Insertion Sort on a list of integers.

2. Write a program to implement a stack S using an array A of size N=8, as the underlying data structure. The stack must support the standard operations isEmpty, PUSH, POP and isFull operations.

3. In the preceding question, modify the isFull and/or PUSH functions to support the following functionality.
If the stack is full when the PUSH function is called, allocate a new array B of size 2 × n, copy all the elements of A into B, make A point to array B, deallocate the old array A, and finally perform the PUSH operation on the new array A.

4. You are given the pointer to the head node of a linked list, an integer to add to the list and the position at which the integer must be inserted. Create a new node with the given integer, insert this node at the desired position and return the head node. A position of 0 indicates head, a position of 1 indicates one node away from the head and so on. The head pointer given may be null meaning that the initial list is empty.

5. You are given the pointer to the head node of a doubly linked list, an integer to add to the list and the position at which the integer must be inserted. Create a new node with the given integer, insert this node at the middle position and return the head node. A position of 0 indicates head, a position of 1 indicates one node away from the head and so on. The head pointer given may be null meaning that the initial list is empty.

6. Write a program to implement a Queue using stack.