ASSIGNMENT (10)

Create a class which simulates a stack that implements the LIFO algorithm (Last-In First-Out). The stack has two data members:
- An array of undefined size.
- A variable that points to the top of the array.

The stack has the following functions:
- A constructor that allocates and defines the size of the array. Also, the constructor initializes the *top* to 0.
- A method that pushes a given value into the top of the array.
- A method that pops the value from the top of the array.
- A method that determines whether the array is full or not.
- A method that determines whether the array is empty or not.

Question (1):
Write a program that executes the following:
- Create one stack of 10 elements.
- The user enters 12 numbers which are pushed into the stack.
  Note: Before pushing any value, the program must check that the stack is not full. If the stack is full, then the value will not be pushed.
- Pop the top 5 elements of the stack and print their values.
  Note: Before popping any value, the program must check that the stack is not empty.

Question (2):
Write a program that executes the following:
- Create three stacks S1, S2, and S3. Two stacks (S1 and S2) have a size of 10 elements each, and the third stack (S3) has a size of 20 elements.
- The even numbers (from 2 to 20) are pushed into S1.
- The odd numbers (from 1 to 19) are pushed into S2.
- Pop the two stacks (S1 and S2, each by turn) and push their values into the third stack (S3), so that the third stack contains the values from 20 to 1.
- Pop all the elements from S3, and print their values (note: the popped values in this case should be: 1, 2, 3, …, 20).