Programming Paradigms Lab Assignment (CS453)

Assignment Sheet 2 : Basic C++ Concepts

Time : Two weeks

Develop the below programs with basic C++ concepts mentioned below wherever applicable.
Note : Don't use the concept of Class

- Standard Input/Output
- Namespace
- Constant
- Reference variables
- Call by Reference
- Template Function
- Default parameter
- Inline function
- Static Polymorphism / Function overloading

Problems

1. Write a program to take input of N number of students information such as Name, Age, Department and Year. The student information should be shored in array of struct. Print those information in the console. Develop functions such as `ReadStudentData(...)`, `PrintStudentData(...)` for this purpose.

2. Develop a program of finite(limited) stack where elements to be stored is integer.
   - All required information(data) to maintain a stack should be bundled in a struct called `MyStack`
   - Develop the below stack routines
     - `Initialize(...)` : This is to initialize the data related to an instance of `MyStack`
     - `Push(...)` : Push element(s) into a particular stack
     - `Pop(...)` : Pop an element from the stack
     - `GetMaxSize(...)` : Should notify the maximum number of elements the stack can store

- `CurrentSize(...)` : Should notify the current number of elements in the stack
- `IsEmpty(...)` : Should notify if the stack is empty

- Demonstrate the basic stack functionality using above routines
- Demonstrate that multiple stack can be instantiated and can co-exists independently

3. Write a generic method to swap two elements. Demonstrate that it works for any data types such as `int, short, float, double` and `struct`.

4. Write a generic method to sort N elements of any basic data type – Sorting algorithm is of your choice. Demonstrate that it works for any basic data types such as `int, short, float, double` etc. Also prove that it does not work for `struct.`

5. Modify the Problem 2 to make it a generic stack to store any kind of data types such as `int, short, float, double or struct`.