S.PES

OOP Assignment :06 21/18

Problem Statement:
Write C++ program using STL for sorting & searching user defined records such as item records (item code, name, cost, quantity etc) using vector container

Objectives:
To learn the concept of STL, searching, sorting & vector container.

Outcomes
Implement searching & sorting algorithms of STL for user defined data-types.

Software requirement:
operating system: Windows-10 home single language
IDE: Code-blocks version 20.03
Compiler: g++ (version : 10.1.0)

Hardware Requirement
manufacturer & model: Acer Nitro-5 (Intel core i5 8th gen)
Installed Memory: 8GB RAM, 512GB SSD
Architecture : 64 bit

Theory:
STL: STL stands for standard template library. It is a set of C++ template classes to provide common programming data structures & functions such as lists, stacks, arrays etc.

STL has four components:
1) Algorithms
2) Containers
3) Functions
4) Iterators.

Algorithms: sorting, searching, etc.
Containers: they store objects & data.
sequence containers: vector, list, dequeue, arrays, forward_list
container Adapters: queue, priority_queue, stack
Associative containers: set, multiset, map, multimap
Unordered Associative containers: unordered_set, unordered_multiset, unordered_map, unordered_multimap
functions: STL includes classes that overload the function call operator
Operators: useful for working upon a sequence of values.

Sorting: it means arranging data in particular fashion which can be increasing or decreasing
sort() function uses IntroSort() which is extension of QuickSort & HeapSort & insertion Sort.
prototype:
Sort(startaddress, endaddress)
- startaddress: address of first element
endaddress: address of last element

Searching:
prototype:
binary_search(start_addres, end_addres, valuetofind)
startaddress: address of first element
endaddress: address of last element
value to find: target value

Pseudo Code:
Algorithm:
1. start
2. Give the header file to use 'vector'
3. Create a vector naming 'personal_records' @ any record you

4. Initialize variables to store name, birth date & telephone number. (or) any other data in according to record
5. Using iterator store as many records you want to store using predefined functions such as push_back().
6. Create another vector 'item_record'
7. Initialize variables to store item code, item_name, quantity & cost @ other data.
8. Using iterator & predefined functions store the data.
9. Using predefined function sort(), sort the data stored according to user requirements.
10. Using predefined function search, search element from the vector the user wants to check.
11. Display & call the function using the menu.
12. End.

Test cases:

① Entering Data.
② Displaying Data.
③ Sorting Data According to requirements
④ Search in data according to requirements.

} output screenshots are attached.

Conclusion:

Hence we have successfully studied the concept of STL (Standard Template Library) & how it makes many data structures easy. It briefs about the predefined functions of STL & their uses such as search() & sort()

```
What do you want to do?
Enter:
        1 for searching an item in record.
        2 for sorting the record.
        0 to exit.
:1

How do you want to search??
Enter:
        1 for search by code.
        2 for search by name.
:1
Enter a code: 234


The item of code 234 is found.
The details are as follows:
Code: 234
Name: Pen
Cost: 10
Quantity: 5
```

```
What do you want to do?
Enter:
        1 for searching an item in record.
        2 for sorting the record.
        0 to exit.
:1

How do you want to search??
Enter:
        1 for search by code.
        2 for search by name.
:2
Enter a name: Rubber


The item of name Rubber is found.
The details are as follows:
Code: 345
Name: Rubber
Cost: 4
Quantity: 2
```

```
What do you want to do?
Enter:
        1 for searching an item in record.
        2 for sorting the record.
        0 to exit.
:2

How do you want to sort??
Enter:
        1 to sort by code.
        2 to sort by name.
        3 to sort by cost.
        4 to sort by quantity.
:1


sorting by code..
Code: 234
Name: Pen
Cost: 10
Quantity: 5

Code: 345
Name: Rubber
Cost: 4
Quantity: 2

Code: 543
Name: Pencil
Cost: 5
Quantity: 4
```

```
What do you want to do?
Enter:
        1 for searching an item in record.
        2 for sorting the record.
        0 to exit.
:2

How do you want to sort??
Enter:
        1 to sort by code.
        2 to sort by name.
        3 to sort by cost.
        4 to sort by quantity.
:3


sorting by cost..
Code: 345
Name: Rubber
Cost: 4
Quantity: 2

Code: 543
Name: Pencil
Cost: 5
Quantity: 4

Code: 234
Name: Pen
Cost: 10
Quantity: 5
```

```
How many items?? 3
For item - 1
Enter name: Pen
Enter code: 234
Enter cost: 10
Enter Quantity: 5

For item - 2
Enter name: Pencil
Enter code: 543
Enter cost: 5
Enter Quantity: 4

For item - 3
Enter name: Rubber
Enter code: 345
Enter cost: 4
Enter Quantity: 2
```