

Assignment no 6

Write C++ program using STL for Sorting and searching with user-defined records such as item record (item code, item name, quantity and cost) using vector container

```
#include <iostream> //standard input output stream header file
#include <algorithm> //The STL algorithms are generic because they can operate on a
variety of data structures
#include <vector> //The header file for the STL vector library is vector.

using namespace std;
class Item
{
    public:
        char name[10];
        int quantity;
        int cost;
        int code;

        bool operator==(const Item& i1) //Boolean operators allow you to
create more complex conditional statements
        {
            if(code==i1.code) //operator will return 1 if the comparison is true, or 0 if
the comparison is false
                return 1;
            return 0;
        }

        bool operator<(const Item& i1)
        {
            if(code<i1.code) //operator will return 1 if the comparison is true, or 0 if
the comparison is false
                return 1;
            return 0;
        }

};

vector<Item> o1;
void print(Item &i1);
void display();
void insert();
void search();
void dlt();

bool compare(const Item &i1, const Item &i2)
```

```
{
//if (i1.name != i2.name) return i1.cost < i2.cost;
return i1.cost < i2.cost;
}
```

```
int main()
{
    int ch;
    do
    {
        cout<<"\n***** Menu *****";
        cout<<"\n1.Insert";
        cout<<"\n2.Display";
        cout<<"\n3.Search";
        cout<<"\n4.Sort";
        cout<<"\n5.Delete";
        cout<<"\n6.Exit";
        cout<<"\nEnter your choice:";
        cin>>ch;

        switch(ch)
        {
            case 1:
                insert();
                break;

            case 2:
                display();
                break;

            case 3:
                search();
                break;

            case 4:
                sort(o1.begin(),o1.end(),compare);
                cout<<"\n\n Sorted on Cost";
                display();
                break;

            case 5:
                dlt();
                break;

            case 6:
                exit(0);
        }
    }
```

```

    }while(ch!=7);

    return 0;
}

void insert()
{
    Item i1;
    cout<<"\nEnter Item Name:";
    cin>>i1.name;
    cout<<"\nEnter Item Quantity:";
    cin>>i1.quantity;
    cout<<"\nEnter Item Cost:";
    cin>>i1.cost;
    cout<<"\nEnter Item Code:";
    cin>>i1.code;
    o1.push_back(i1);
}

void display()
{
    for_each(o1.begin(),o1.end(),print);
}

void print(Item &i1)
{
    cout<<"\n";
    cout<<"\nItem Name:"<<i1.name;
    cout<<"\nItem Quantity:"<<i1.quantity;
    cout<<"\nItem Cost:"<<i1.cost;
    cout<<"\nItem Code:"<<i1.code;
}

void search()
{
    vector<Item>::iterator p;
    Item i1;
    cout<<"\nEnter Item Code to search:";
    cin>>i1.code;
    p=find(o1.begin(),o1.end(),i1);
    if(p==o1.end())
    {
        cout<<"\nNot found.";
    }
    else
    {

```

```

        cout<<"\nFound.";
    }
}

void dlt()
{
    vector<Item>::iterator p;
    Item i1;
    cout<<"\nEnter Item Code to delete:";
    cin>>i1.code;
    p=find(o1.begin(),o1.end(),i1);
    if(p==o1.end())
    {
        cout<<"\nNot found.";
    }
    else
    {
        o1.erase(p);
        cout<<"\nDeleted.";
    }
}

```

Output:

***** Menu *****

1.Insert

2.Display

3.Search

4.Sort

5.Delete

6.Exit

Enter your choice:1

Enter Item Name:pen

Enter Item Quantity:2

Enter Item Cost:20

Enter Item Code:02

***** Menu *****

1.Insert

2.Display

3.Search

4.Sort

5.Delete

6.Exit

Enter your choice:2

Item Name:pen

Item Quantity:2

Item Cost:20

Item Code:2

***** Menu *****

1.Insert

2.Display

3.Search

4.Sort

5.Delete

6.Exit

Enter your choice:3

Option B

Use STL for Sorting and searching with user-defined records such as Person Record (Name, birth date, telephone no).

```
#include <algorithm>
```

```
#include <iostream>
```

```
#include <vector>
```

```
#include <string>
```

```
using namespace std;
```

```
class student
```

```
{
```

```
public:
```

```
    int rollno;
```

```
    string name;
```

```
    char dob[15];
```

```
    bool operator==(const student &student1)
```

```
    {
```

```
        return(rollno==student1.rollno);
```

```
    }
```

```
    bool operator<(const student &student1)
```

```
    {
```

```
        return(rollno<student1.rollno);
```

```
    }
```

```
    friend ostream& operator << (ostream &out, const student &);
```

```
    friend istream& operator >> (istream &in, student &k);
```

```
};
```

```
ostream & operator << (ostream &out, const student &k)
```

```
{
```

```

        out<<"\n\t\t"<<k.rollno<<"\t\t"<<k.name<<"\t\t"<<k.dob;
    return out;
}

```

```

istream & operator >> (istream &in , student &k)
{
    cout<<"\nEnter Roll No : ";
    in>>k.rollno;
    cout<<"\nEnter Name : ";
    in>>k.name;
    cout<<"\nEnter DOB : ";
    in>>k.dob;
    return in;
}

```

```

bool myfunc(const student &k, const student &i2)
{
    return(k.rollno<i2.rollno);
}

```

```

vector<student> read()
{
    int n;
    student k;
    vector<student> j;
    cout<<"\nEnter total no. of students : ";
    cin>>n;
    for(int i=0;i<n;i++)
    {
        cin>>k;
        j.push_back(k);
    }
    return j;
}

```

```

void printfunction(const student &k)
{
    cout<<k;
}

```

```

void print( const vector<student> &j)
{
    cout<<"\n\t\tROLL NO\t\tNAME\t\tDATE OF BIRTH";
}

```

```

        for_each(j.begin(),j.end(),printfunction);

    }

void insert(vector<student> &j)
{
    student k;
    cin>>k;
    j.push_back(k);
}

void delet(vector<student>&j)
{
    student k;
    cout<<"\nEnter Student Roll No To Delete : ";
    cin>>k.rollno;
    vector<student>::iterator p;
    p=find(j.begin(),j.end(),k);
    if(p!=j.end())
    {
        j.erase(p);
        cout<<"Record deleted successfully";
    }
    else
        cout<<"\nNot found ";
}

void search( vector<student>&j )
{
    student k;
    cout<<"\nEnter Student Roll No To Search : ";
    cin>>k.rollno;
    cout<<"\n\n\t\tROLL NO\t\tNAME\t\tDATE OF BIRTH";
    vector<student>::iterator p;
    p=find(j.begin(),j.end(),k);
    if(p!=j.end())
        cout<<*p;
    else
        cout<<"\nNot found ";
}

```

```

void sort( vector<student> &j)
{
    sort(j.begin(),j.end(),myfunc);
}

```

```

int main()
{
    vector<student> j;
    int op;
    do
    {
        cout<<"\n\n\t\t-----<< MENU >>-----";
        cout<<"\n\t\t1.Create ";
        cout<<"\n\t\t2.Display ";
        cout<<"\n\t\t3.Insert ";
        cout<<"\n\t\t4.Delete ";
        cout<<"\n\t\t5.Search ";
        cout<<"\n\t\t6.Sort";
        cout<<"\n\t\t7.Quit";
        cout<<"\n\t\t-----";
        cout<<"\n\t\tEnter your choice : ";
        cin >> op;
        switch(op)
        {
            case 1:
                j=read();
                break;

            case 2:
                print(j);
                break;

            case 3:
                insert(j);
                break;

            case 4:
                delet(j);
                break;

            case 5:
                search(j);
                break;

            case 6:
                sort(j);
                print(j);
                break;

```



```
    }  
    }while(op!=7);  
}
```

Output:

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 1

Enter total no. of students : 3

Enter Roll No : 48

Enter Name : JABIR

Enter DOB : 16/11/1992

Enter Roll No : 44

Enter Name : RITESH

Enter DOB : 14/11/1992

Enter Roll No : 46

Enter Name : AKASH

Enter DOB : 08/11/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 2

ROLL NO	NAME	DATE OF BIRTH
48	JABIR	16/11/1992
44	RITESH	14/11/1992
46	AKASH	08/11/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 3

Enter Roll No : 42

Enter Name : NIKHIL

Enter DOB : 10/10/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 2

ROLL NO	NAME	DATE OF BIRTH
48	JABIR	16/11/1992
44	RITESH	14/11/1992
46	AKASH	08/11/1992
42	NIKHIL	10/10/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert

- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 4

Enter Student Roll No To Delete : 46

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 2

ROLL NO	NAME	DATE OF BIRTH
48	JABIR	16/11/1992
44	RITESH	14/11/1992
42	NIKHIL	10/10/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 5

Enter Student Roll No To Search : 48

ROLL NO	NAME	DATE OF BIRTH
48	JABIR	16/11/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert

- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 6

ROLL NO	NAME	DATE OF BIRTH
42	NIKHIL	10/10/1992
44	RITESH	14/11/1992
48	JABIR	16/11/1992

-----<< MENU >>-----

- 1.Create
- 2.Display
- 3.Insert
- 4.Delete
- 5.Search
- 6.Sort
- 7.Quit

Enter your choice : 7
