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Roll Number: SYCOC303

Division: C

PRN Number: 122B2B303

Batch: C4

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Problem Statement:

A) Write C++ program using STL to add binary numbers (assume one bit as one number), use STL stack.

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INPUT:

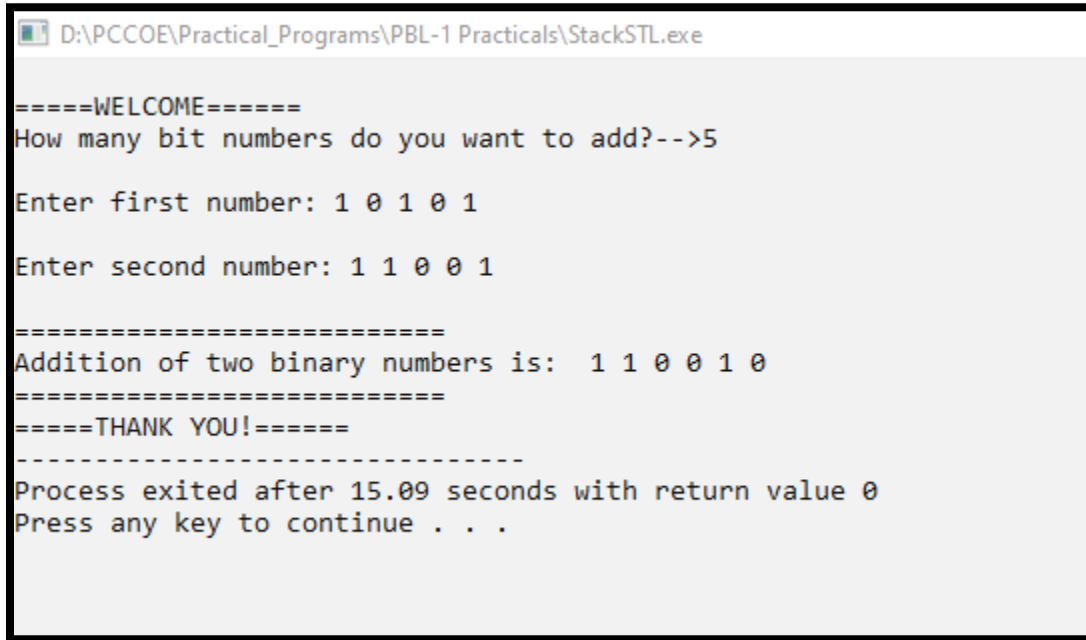
```
/*
 *  =====
 *      Program Name: StackSTL.cpp
 *      Created on: December 22, 2022
 *      Author: Vinayak Shete
 *  =====
 */
#include <iostream>
#include <stack>
using namespace std;
int main()
{
    stack<int> stack1,stack2,ans;
    int n;
    cout<<"\n=====WELCOME=====";
    cout<<"\nHow many bit numbers do you want to add?-->";
    cin>>n;
    int tmp1,tmp2;
    int f=0;
    cout<<"\nEnter first number: ";
    for(int i=0;i<n;i++)
    {
        cin>>tmp1;
```

```
        if(tmp1==0 || tmp1==1)
        {
            stack1.push(tmp1);
            continue;
        }
        else{
            f=1;
            cout<<"\nPlease enter 0 or 1!";
            goto end;
        }
    }
    cout<<"\nEnter second number: ";
    for(int i=0;i<n;i++)
    {
        cin>>tmp2;
        if(tmp2==0 || tmp2==1)
        {
            stack2.push(tmp2);
            continue;
        }
        else{
            cout<<"\nPlease enter 0 or 1!";
            f=1;
            goto end;
        }
    }
    int tmpadd;
    int carry;
    carry=0;
    //logic for addition
    for(int i=0;i<n;i++)
    {
        tmpadd=stack1.top()+stack2.top()+carry;
        if(tmpadd==0 || tmpadd==1) // all 2 are zero or one is 1
        {
            ans.push(tmpadd);
        }
    }
```

```
        else if(tmpadd==2) //2 are one
        {
            carry=1;
            ans.push(0);
        }
        else if(tmpadd==3) //3 are one
        {
            carry=1;
            ans.push(1);
        }
        stack1.pop();
        stack2.pop();
    }
    if(carry==1)
    {
        ans.push(carry);
        n+=1;
    }
    //display addition
    cout<<"\n===== ";
    cout<<"\nAddition of two binary numbers is: ";
    for(int i=0;i<n;i++)
    {
        cout<<" "<<ans.top();
        ans.pop();
    }
    cout<<"\n===== ";
    if(f==1)
    {
        end:
        cout<<"\nProgram ended!";
    }
    cout<<"\n====THANK YOU!====";
    return 0;
}
```

=====

OUTPUT:



```
D:\PCCOE\Practical_Programs\PBL-1 Practicals\StackSTL.exe

=====WELCOME=====
How many bit numbers do you want to add?-->5

Enter first number: 1 0 1 0 1
Enter second number: 1 1 0 0 1

=====
Addition of two binary numbers is:  1 1 0 0 1 0
=====
=====THANK YOU!=====
-----
Process exited after 15.09 seconds with return value 0
Press any key to continue . . .
```

=====

Problem Statement:

B) Write C++ program using STL map for managing Person Record (Name, birth date, telephone no). Perform operations – add, display, search, delete, and update.

=====

INPUT:

```
/*
 *  =====
 *      Program Name: MapSTL.cpp
 *      Created on: December 22, 2022
 *      Author: Vinayak Shete
 *  =====
 */

#include <iostream>
#include <iomanip>
#include <map> // ...STL MAP
using namespace std;

class Person
{
    private:
        string name;
        string dob;
        long int tel;

    public:
        void Input();
        friend ostream &operator<<(ostream &out, const Person &r);
};

// displaying data..
```

```
ostream &operator<<(ostream &out, const Person &p)
{
    out << left << setw(10) << p.name;
    out << left << setw(13) << p.dob;
    out << left << setw(10) << p.tel;
    return out;
}

// function for reading the data
void Person::Input()
{
    cout << "\nEnter the name: ";
    cin >> name;
    cout << "\nEnter the Date of Birth (dd/mm/yyyy): ";
    cin >> dob;
    cout << "\nEnter the telephone number: ";
    cin >> tel;
}

// # Class Map
class Map
{
    map<int, Person> m; // ...Map [key,data] pair
public:
    void add();
    void display();
    void search();
    void del(); // ...Delete Function
    void update();
};

//adding data..
void Map::add()
{
    int key;
    Person p;
    cout << "\nEnter ID: ";
```

```
    cin >> key;
    cout << "Enter the Person Data:\n";
    p.Input();
    m.insert(pair<int, Person>(key, p));
}

//displaying data..
void Map::display()
{
    cout << "\n===== \n";
    cout << left << setw(10) << "ID";
    cout << left << setw(13) << "Name";
    cout << left << setw(10) << "DOB";
    cout << left << setw(10) << "Telephone";
    cout << "\n===== \n";

    //iterator..
    map<int, Person>::iterator i = m.begin();
    for (i; i != m.end(); ++i)
    {
        cout << left << setw(10) << i->first;
        cout << i->second;
        cout << "\n===== \n";
    }
}

//searching the data..
void Map::search()
{
    int key, flag = 0;
    cout << "\nEnter ID of the person you want to search: ";
    cin >> key;
    //iterator..
    map<int, Person>::iterator i = m.begin();
    for (i; i != m.end(); ++i)
    {
        if (i->first == key)
```

```

    {
        flag = 1;
        cout << "\nData Found Successfully!!" << endl;
        cout << "\n===== \n";
        cout << left << setw(10) << "Name";
        cout << left << setw(13) << "DOB";
        cout << left << setw(10) << "Telephone";
        cout << "\n===== \n";
        cout << i->second;
        cout << "\n===== \n";
        break;
    }
}
if (flag == 0)
    cout << "\nEntered ID does not exist in the database..!! \n";
}

// # Delete Data
void Map::del()
{
    int key, flag = 0;
    cout << "\nEnter the ID of the person you want to delete: ";
    cin >> key;
    //iterator..
    map<int, Person>::iterator i = m.begin();
    for (i; i != m.end(); ++i)
    {
        if (i->first == key)
        {
            flag = 1;
            m.erase(key);
            cout << "\nData deleted Successfully!!" << endl;
            break;
        }
    }
}
if (flag == 0)
    cout << "\nEntered ID does not exist in the database..!! \n";
}

```



```

}

//updating data..
void Map::update()
{
    int key, flag = 0;
    cout <<"\nEnter the ID of the person you want to update: ";
    cin >> key;
    //iterator..
    map<int, Person>::iterator i = m.begin();
    for (i; i != m.end(); ++i)
    {
        if (i->first == key)
        {
            flag = 1;
            m.erase(key);
            Person p;
            cout <<"\nEnter updated(new) data: " << endl;
            p.Input();
            m.insert(pair<int, Person>(key, p));
            cout <<"\nData updated Successfully!!" << endl;
            break;
        }
    }
    if (flag == 0)
        cout <<"\nEntered ID does not exist in the database..!\n";
}

// # Main Function
int main()
{
    // # STL MAP
    cout<<"\n=====WELCOME===== ";
    cout<<"\n=====MAP STL===== ";
    Map t;
    int ch,doch;
    do

```

```
{  
    cout << "\n=====";  
    cout << "\n1.Add Record"  
        << "\n2.Display Record"  
        << "\n3.Search Record"  
        << "\n4.Delete Record"  
        << "\n5.Update Record"  
        << "\n6.Exit";  
    cout << "\nEnter your choice:";  
    cin >> ch;  
    switch (ch)  
    {  
    case 1:  
        cout << "\nAdd Record==>" << endl;  
        t.add();  
        break;  
  
    case 2:  
        cout << "\nDisplay Record==>" << endl;  
        t.display();  
        break;  
  
    case 3:  
        cout << "\nSearch Record==>" << endl;  
        t.search();  
        break;  
  
    case 4:  
        cout << "\nDelete Record==>" << endl;  
        t.del();  
        break;  
  
    case 5:  
        cout << "\nUpdate Record==>" << endl;  
        t.update();  
        break;  
    }
```

```
        case 6:
            goto exit;
            break;

        default:
            cout << "\nPlease enter correct choice!" << endl;
            break;
    }
    cout<<"\n====\nDo you want to continue?[1 for YES || 0 for NO]";
    cin>>doch;
} while (doch=1);

exit:
    cout<<"\n=====THANK YOU!=====";
    return 0;
}
```

OUTPUT:

```
=====WELCOME=====
=====MAP STL=====
=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:1

Add Record==>

Enter ID: 101
Enter the Person Data:

Enter the name: Vinayak

Enter the Date of Birth (dd/mm/yyyy): 18/12/2002

Enter the telephone number: 99999999

====
Do you want to continue?[1 for YES || 0 for NO]1
```

```
Add Record==>

Enter ID: 102
Enter the Person Data:

Enter the name: Onkar

Enter the Date of Birth (dd/mm/yyyy): 29/04/2003

Enter the telephone number: 88888888

====
Do you want to continue?[1 for YES || 0 for NO]1

=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:
```

```
=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:2

Display Record==>

=====
ID          Name        DOB          Telephone
=====
101         Vinayak    18/12/2002   99999999
=====
102         Onkar      29/04/2003   88888888
=====
103         Sushant    05/10/2004   66666666
=====
104         Suyash    06/03/1998   33333333
=====

====
Do you want to continue?[1 for YES || 0 for NO]
```

```
=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:3

Search Record==>

Enter ID of the person you want to search: 101

Data Found Successfully!!

=====
Name          DOB          Telephone
=====
Vinayak      18/12/2002    99999999
=====

====
Do you want to continue?[1 for YES || 0 for NO]
```

```
=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:4

Delete Record==>

Enter the ID of the person you want to delete: 103

Data deleted Successfully!!

====
Do you want to continue?[1 for YES || 0 for NO]1

=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:2

Display Record==>

=====
ID          Name          DOB          Telephone
=====
101         Vinayak    18/12/2002    99999999
=====
102         Onkar      29/04/2003    88888888
=====
104         Suyash    06/03/1998    33333333
=====

====
Do you want to continue?[1 for YES || 0 for NO]
```

```
Enter your choice:5
Update Record==>
Enter the ID of the person you want to update: 102
Enter updated(new) data:
Enter the name: Omkar
Enter the Date of Birth (dd/mm/yyyy): 29/05/2003
Enter the telephone number: 77777777
Data updated Successfully!!

====
Do you want to continue?[1 for YES || 0 for NO]1

=====
1.Add Record
2.Display Record
3.Search Record
4.Delete Record
5.Update Record
6.Exit
Enter your choice:2

Display Record==>

=====
ID          Name      DOB      Telephone
=====
101         Vinayak   18/12/2002  99999999
=====
102         Omkar     29/05/2003  77777777
=====
104         Suyash   06/03/1998  33333333
=====

====
Do you want to continue?[1 for YES || 0 for NO]
```