OOP LAB

Lab Report No. 03

Submitted By: Jamshid Bacha

Regesteration No. 16PWCSE1404

Submitted To: Engr. Sumayya Salahuddin

Section: B

Batch: 18

Department: CSE

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University of Engineering and Technology Peshawar

Home Task

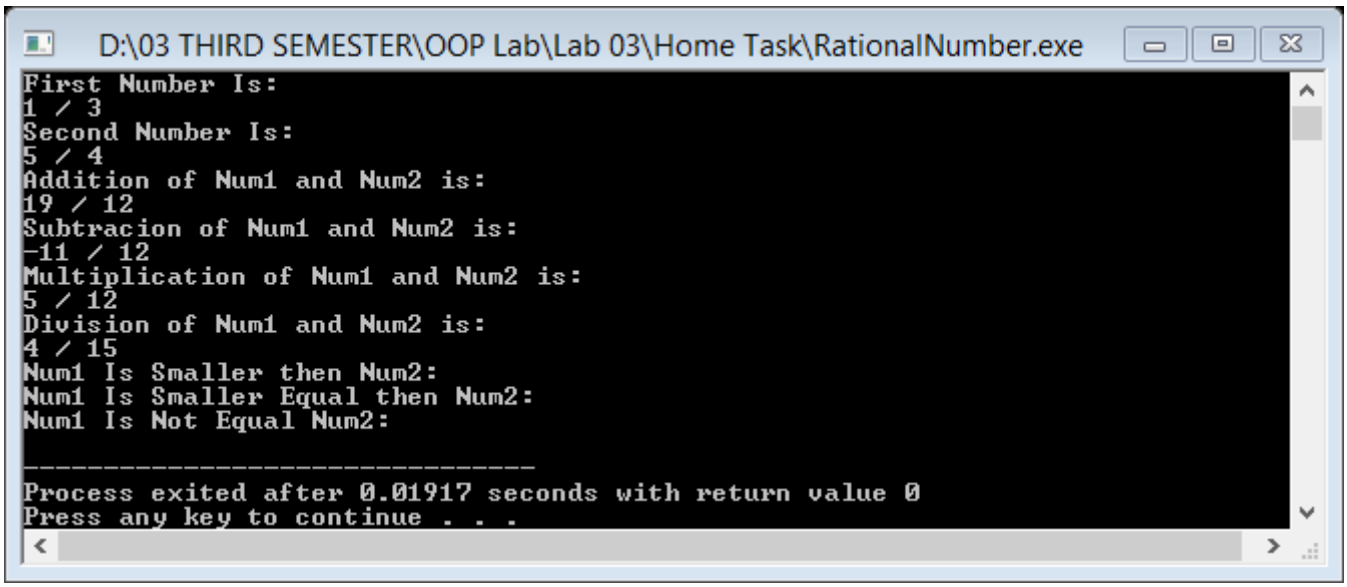
Task 01:

```
#include<iostream>
using namespace std;

class RationalNumber
{
	private:
		int numerator,denominator;
	public:
		RationalNumber();
		RationalNumber(int nom,int denom);
		void AddFraction(RationalNumber num1,RationalNumber num2);
		void SubtractFraction(RationalNumber num1,RationalNumber num2);
		void MultiplyFraction(RationalNumber num1,RationalNumber num2);
		void Division(RationalNumber num1,RationalNumber num2);
		void display();

		bool isGreater(RationalNumber num1,RationalNumber num2);
		bool isSmaller(RationalNumber num1,RationalNumber num2);
		bool isGreaterEqual(RationalNumber num1,RationalNumber num2);
		bool isSmallerEqual(RationalNumber num1,RationalNumber num2);
		bool isEqual(RationalNumber num1,RationalNumber num2);
		bool isNotEqual(RationalNumber num1,RationalNumber num2);
};
RationalNumber::RationalNumber()
{
	numerator=1;
	denominator=1;
}
RationalNumber::RationalNumber(int nom,int denom)
{
	numerator=nom;
	if(denom>0)
	denominator=denom;
	else
	denominator=1;
}
void RationalNumber::AddFraction(RationalNumber num1,RationalNumber num2)
{
	numerator=num1.numerator*num2.denominator + num2.numerator*num1.denominator;
	denominator=num1.denominator*num2.denominator;
}
void RationalNumber::SubtractFraction(RationalNumber num1,RationalNumber num2)
{
	numerator=num1.numerator*num2.denominator - num1.denominator*num2.numerator;
```

```
	denominator=num1.denominator*num2.denominator;
}
void RationalNumber::MultiplyFraction(RationalNumber num1,RationalNumber num2)
{
	numerator=num1.numerator*num2.numerator;
	denominator=num1.denominator*num2.denominator;
}
void RationalNumber::Division(RationalNumber num1,RationalNumber num2)
{
	numerator=num1.numerator*num2.denominator;
	denominator=num1.denominator*num2.numerator;
}
void RationalNumber::display()
{
	cout<<numerator<<" / "<<denominator<<endl;
}
bool RationalNumber::isGreater(RationalNumber num1,RationalNumber num2)
{
	if(((float)num1.numerator/(float)num1.denominator)>((float)num2.numerator/(float)num2.denominator))
	return true;
	else
	return false;
}
bool RationalNumber::isSmaller(RationalNumber num1,RationalNumber num2)
{
	if(((float)num1.numerator/(float)num1.denominator)<((float)num2.numerator/(float)num2.denominator))
	return true;
	else
	return false;
}
bool RationalNumber::isGreaterEqual(RationalNumber num1,RationalNumber num2)
{
	if(((float)num1.numerator/(float)num1.denominator)>=((float)num2.numerator/(float)num2.denominator))
	return true;
	else
	return false;
}

bool RationalNumber::isSmallerEqual(RationalNumber num1,RationalNumber num2)
{
	if(((float)num1.numerator/(float)num1.denominator)<=((float)num2.numerator/(float)num2.denominator))
	return true;
	else
	return false;
}
bool RationalNumber::isEqual(RationalNumber num1,RationalNumber num2)
{
	if(((float)num1.numerator/(float)num1.denominator)==((float)num2.numerator/(float)num2.denominator))
```

```
        return true;
        else
        return false;
}
bool RationalNumber::isNotEqual(RationalNumber num1,RationalNumber num2)
{
        if(((float)num1.numerator/(float)num1.denominator)!=((float)num2.numerator/(float)num2.denominator))
        return true;
        else
        return false;
}
int main()
{
        RationalNumber num1(1,3),num2(5,4),num3;
        cout<<"First Number Is: "<<endl;
        num1.display();

        cout<<"Second Number Is: "<<endl;
        num2.display();

        num3.AddFraction(num1,num2);
        cout<<"Addition of Num1 and Num2 is: "<<endl;
        num3.display();

        num3.SubtractFraction(num1,num2);
        cout<<"Subtracion of Num1 and Num2 is: "<<endl;
        num3.display();

        num3.MultiplyFraction(num1,num2);
        cout<<"Multiplication of Num1 and Num2 is: "<<endl;
        num3.display();
        num3.Division(num1,num2);
        cout<<"Division of Num1 and Num2 is: "<<endl;
        num3.display();

        if(num3.isGreater(num1,num2))
                cout<<"Num1 Is Greater then Num2: "<<endl;
        if(num3.isSmaller(num1,num2))
                cout<<"Num1 Is Smaller then Num2: "<<endl;
        if(num3.isGreaterEqual(num1,num2))
                cout<<"Num1 Is Greater and Equal then Num2: "<<endl;
        if(num3.isSmallerEqual(num1,num2))
                cout<<"Num1 Is Smaller Equal then Num2: "<<endl;
        if(num3.isEqual(num1,num2))
                cout<<"Num1 is Equal to Num2: "<<endl;
        if(num3.isNotEqual(num1,num2))
                cout<<"Num1 Is Not Equal Num2: "<<endl;
        return 0;
```

}



Task 02:

```
#include<iostream>
using namespace std;
class IntegerSet
{
	private:
		bool Integer[50];
	public:
		IntegerSet();
		IntegerSet unionOfIntegerSets(IntegerSet a,IntegerSet b);
		IntegerSet intersectionOfIntegerSets(IntegerSet a,IntegerSet b);
		bool isEqualTo(IntegerSet a,IntegerSet b);
		void insertElement(int x);
		void deleteElement(int y);
		void showset();

};

IntegerSet::IntegerSet()
{
	for(int i=0;i<50;i++)
	{
		Integer[i]=0;
	}
}
void IntegerSet::insertElement(int x)
{
	if(x>=0 && x<50)
	{
```

```
                Integer[x]=1;
        }
}
IntegerSet IntegerSet::unionOfIntegerSets(IntegerSet a,IntegerSet b)
{
        IntegerSet third_set;
        for(int i=0;i<50;i++)
        {
                if(a.Integer[i]==1 || b.Integer[i]==1)
                {
                        third_set.Integer[i]=1;
                }
        }
        return third_set;
}
IntegerSet IntegerSet::intersectionOfIntegerSets(IntegerSet a,IntegerSet b)
{
        IntegerSet third_set;
        for(int i=0;i<50;i++)
        {
                if(a.Integer[i]==1 && b.Integer[i]==1)
                third_set.Integer[i]=1;
        }
        return third_set;
}
void IntegerSet::deleteElement(int y)
{
        if(y>=0 && y<50)
        {
                Integer[y]=0;
        }
}
void IntegerSet::showset()
{
        for(int i=0;i<50;i++)
        {
                if(Integer[i]==1)
                {
                        cout<<" "<<i;
                }
        }
        cout<<endl;
}
bool IntegerSet::isEqualTo(IntegerSet a,IntegerSet b)
{
   for(int i=0;i<50;i++)
   {
        if(a.Integer[i]!=b.Integer[i])
```

```
            return false;
        else
                return true;
    }
}
int main()
{
        cout<<"Enter the Set element to finish enter -1: "<<endl;
        int element;
        IntegerSet a , b , c ,d;
        while(cin>>element,element!=-1)
        {
                a.insertElement(element);
        }
        cout<<"Set A: ";
        a.showset();
        cout<<endl<<"Enter Second Set element: "<<endl;
        element=0;
        while(cin>>element,element!=-1)
        {
                b.insertElement(element);
        }
        cout<<"Set B: ";
        b.showset();
        cout<<endl<<"The Union of set A and set B is U: ";
        c=c.unionOfIntegerSets(a,b);
        c.showset();
        cout<<endl<<"The Intersection of set A and set B is I: ";
        d=d.intersectionOfIntegerSets(a,b);
        d.showset();

        if(c.isEqualTo(a,b))
                cout<<endl<<"Set A and Set B are Equal: "<<endl;
        else
                cout<<endl<<"Set A and Set B are not Equal: "<<endl;

        cout<<endl<<"IF you want to delet some element from Set A then enter it: "<<endl;
        element=0;
        while(cin>>element,element!=-1)
        {
        a.deleteElement(element);
        }

        cout<<"After deleting some element from Set A: ";
        a.showset();

        cout<<endl<<"IF you want to delet some element from Set B then enter it: "<<endl;
        element=0;
```

```
        while(cin>>element,element!=-1)
        {
                b.deleteElement(element);
        }

        cout<<"After deleting some element from Set B: ";
        b.showset();

        cout<<endl<<"The Union of set A and set B is U: ";
        c=c.unionOfIntegerSets(a,b);
        c.showset();

        cout<<endl<<"The Intersection of set A and set B is I: ";
        d=d.intersectionOfIntegerSets(a,b);
        d.showset();

}
```

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```
Enter the Set element to finish enter -1:
1
2
3
4
-1
Set A:  1 2 3 4

Enter Second Set element:
1
2
3
4
-1
Set B:  1 2 3 4

The Union of set A and set B is U:  1 2 3 4

The Intersection of set A and set B is I:  1 2 3 4

Set A and Set B are Equal:

IF you want to delet some element from Set A then enter it:
1
2
-1
After deleting some element from Set A:  3 4

IF you want to delet some element from Set B then enter it:
3
4
-1
After deleting some element from Set B:  1 2

The Union of set A and set B is U:  1 2 3 4

The Intersection of set A and set B is I:

--------------------------------
Process exited after 36.93 seconds with return value 0
Press any key to continue . . .
```