Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:32:59 **Register Number:** RA1911026010033

Q. Adding Array

Ajay is purchasing groceries from the supermarket. Before paying the bill he wants to cross check the total items and the amount of each.
Help him to store the prices in an array and add those costs.
Input:
1.Get the 5 integer values in first five line
2.Get the 5 float values in the next five lines.
Mandatory:
1.Create a Template Class as
template
2. Create the "sum" template function to find the data length and for the addition of data.
3. Call the sum template function in the main method and print the values.
Output:
1. Print the sum of integers in first line and sum of floats in second line.
Refer the following testcases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>
T sum(T arr[]){
    T a = 0;
    for(int i = 0; i < 5; i++){
        a += arr[i];
    }
    return a;
}

int main(){
    for(int i = 0; i < 2; i++){
      float arr[5];
        for(int j = 0; j < 5;j++){
            cin >> arr[j];
        }
        cout << sum(arr) << endl;
    }

    return 0;
}
```

Sample Input

```
1
2
3
4
5
1.1
2.2
3.3
4.4
5.5
```

Sample Output

```
15
16.5
```

Result

Thus, Program " **Adding Array** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:31:34 **Register Number:** RA1911026010033

Q. Adding Numbers

Ram has newly joined in the XXX bank. He had stuck in tallying the accounts in the month end. Help him to tally the accounts by summing up the credits to the bank for that month.

Input:

1.Get the two float values in second line of the input.

Mandatory:

1.Create a Template Class as
template

2.Create a "displayresult" template function to find the sum of chocolates and to display it.

3.Call the displayresult function from the main method to display the sum of chocolates.

Output:

Display the output in the separate line.

Refer the following testcases.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>
T displayresult(T a , T b){
    T c = a +  b;
    return c;
}

int main(){
    float a,b;
    cin >> a >> b;
    cout << a << endl;
    cout << b << endl;
    cout << displayresult(a,b) << endl;
    return 0;
}
```

Sample Input

```
3.5 4.6
```

Sample Output

```
3.5
4.6
8.1
```

Result

Thus, Program " **Adding Numbers** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:16:45 **Register Number:** RA1911026010033

Q. Address Map

Naresh the programmer has given the task to his juniors in the team.
The task is creating a map of type and add given Keys and Values.
Erase the Entry with given key and print the Map.
Mandatory:-
1. Create a map mymap using map mymap;
2.Insert values to map using .insert()
3.Erase the Entry using .erase(key_to_deleted);
4.Traverse and print the values using iterator.
Refer sample testcases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
#include<map>
using namespace std;
int main(){

    int size;
    cin >> size;
   map<int,int>mymap;
    for(int i = 0; i < size; i++){
        int a,b;
        cin >> a >> b;
        mymap.insert({a,b});
    }
    int key_to_deleted;
    cin >> key_to_deleted;
    mymap.erase(key_to_deleted);
   map<int,int>::iterator it;
    for(it= mymap.begin(); it !=mymap.end(); it++){
        cout << it->first << " " << it->second << endl;
    }
    return 0;
}
```

Sample Input

```
5
1 1
2 12
3 123
4 1234
5 12345
3
```

Sample Output

```
1 1
2 12
4 1234
5 12345
```

Result

Thus, Program " **Address Map** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:41:55 **Register Number:** RA1911026010033

Q. Anti-Proxy Attendance

Faculty in SRM University has a tedious task of taking attendance where students do all the tricks to put proxy.

So Faculty advisor of the students decided to make the attendance marking process simple using constructor overloading.

What faculty advisor wants from you is to develop a code using constructor overloading that by Default prints "No Attendance" when no parameters are passed and Hello followed by name when name is passed as parameter.

Mandatory:

1.Create a new class named "Student"

2.Create a variable "name" to get the name of the student.

3.Create a constructor for the class "Student" with parameter char array (name) and without parameter.

4.Create a object named "stdabs" and "stdpst"for the class "Student" in the main method.

5.Access the "Student" class from the main class using "stdabs" and "stdpst" object to print "No Attendance" and "Hello followed by name" respectively.

Refer Sample Test Cases.

Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include <string.h>
using namespace std;
class Student
{
  char stuname[20];
  public:
   Student()
   {
     cout<<"No Attendance";
   }
  Student(char name[])
  {
    strcpy(stuname,name);
  }
  void display()
  {
    cout<<"\nHello "<<stuname<<endl;
  }
};
int main()
{
 Student stdabs;
    char name[20];
    cin>>name;
    Student stdpst(name);
    stdpst.display();
 return 0;
}
```

Sample Input

```
Ranveer
```

Sample Output

```
No Attendance
Hello Ranveer
```

Result

Thus, Program " **Anti-Proxy Attendance** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:52:08 **Register Number:** RA1911026010033

Q. Arulmozhivarman and his pets

Arulmozhivarman is a cholla price and a pet lover. He has a lot of his favorite pets cats and dogs in the barn. He knows that there are C cats and D dogs in the barn. Also, one day went to field and found that there were L legs of the animals touching the ground. Arulmozhivarman knows that cats love to ride on the dogs. So, they might ride on the dogs, and their legs won't touch the ground and Arulmozhivarman would miss counting their legs. Arulmozhivarman's dogs are strong enough to ride at max two cats on their back.

It was a cold foggy morning, when Arulmozhivarman did this counting. So he is now wondering whether he counted the legs properly or not. Specifically, he is wondering is there a some possibility of his counting being correct. Please help Arulmozhivarman in finding it.

Input Format:

First line of the input contains an integer T denoting number of test cases. T test cases follow.

The only line of each test case contains three space separated integers C, D, L denoting number of the cats, number of the dogs and number of legs of animals counted by Arulmozhivarman, respectively.

Output Format:

For each test case, output a single line containing a string "yes" or "no" (both without quotes) according to the situation.

Constraints:

1 â%¤ T â%¤ 10 power 5
0 â%¤ C, D, L â%¤ 10 power 9

Explanation

Example 1. There is one cat and one dog. The number of legs of these animals on the ground are 8, it can be possible when both cat and dog are standing on the ground.

Example 2. There is one cat and one dog. The number of legs of these animals on the ground are 4, it can be possible if the cat will ride on the dog, so its legs won't be counted by Arulmozhivarman, only the dog's legs will be counted.

Example 3. There is one cat and one dog. The number of legs of these animals are 2, it can not be true at all, Arulmozhivarman might have made some mistake. Hence answer is "no".

Mandatory:

1. Create a new class named "catanddog" and the object name for the new class should be "obj".

2. Create a methods as follows:

a. Method name = count()
b. Type = void
c. Access Specifier = public
d. Argument Type = no arguments

3. Access the method count() using the object name "obj" from the main method.

Source Code

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

class catanddog{
 public:
    int c,d,l,t;
    void count(){
        int t;
          cin >> t;
          while(t--){
            cin >> c >> d >> l;
              long long  int answer = l - 4 * d;
              if(answer < 0 || answer > 4 * c || answer %  4 != 0){
                cout << "no" << endl;
               }else{
                cout << "yes" << endl;
               }
          }
      }
}obj;

int main() {
 obj.count();
 return 0;
}
```

Sample Input

```
3
1 1 8
1 1 4
1 1 2
```

Sample Output

```
yes
yes
no
```

Result

Thus, Program " **Arulmozhivarman and his pets** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:46:01 **Register Number:** RA1911026010033

Q. Bank

Develop a program to find the interest.

Interest rate=12, year=3.Create three classes "Bank", "Customer", "Account", "Bank" and "Customer" classes are parent class to the Account.

Use multiple inheritance concept.
Ex; class Account:public Customer,public Bank
Refer sample input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Bank{
   public :
      string Account_No;
      int account_Balance;
};

class Customer{
   public:
      string name;
      int id;

};

class Account:public Customer,public Bank{
   public:
   int getInterest(){
      return (round(account_Balance * (1 + 0.12 * 3))-account_Balance);
   }
};

int main(){
   Account obj;
   cin >> obj.name >> obj.id >> obj.Account_No >>obj.account_Balance;
   cout << "Customer Name=" << obj.name << endl;
   cout << "Customer Id=" << obj.id << endl;
   cout << "Account No=" << obj.Account_No << endl;
   cout << "Account Balance=" << obj.account_Balance << endl;
   cout << "Interest=" << obj.getInterest() << endl;
   return 0;
}
```

Sample Input

```
shiva
12345
456789012
100000
```

Sample Output

```
Customer Name=shiva
Customer Id=12345
Account No=456789012
Account Balance=100000
Interest=36000
```

Result

Thus, Program " **Bank** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:51:18 **Register Number:** RA1911026010033

Q. Bhagavan the Inspirational Teacher

Bhagavan the Government school teacher from Karur district is so involved with his students development which in turn even forced the Tamilnadu Educational department to cancel his transfer from his old school on the request of his students.

He is such an inspirational teacher.Now he has been assigned the new set of students from other schools to train them.So before starting the training he wants to collect the personal details from the new student for maintaining the record in his school.

Can you help him to automate his task of collecting student details?

Mandatory:

1.Create a class "student"

2.Create the following datamembers:
a)roll,
b)name,
c)height and
d)weight.

3.Create a DEFAULT CONSTRUCTOR to assign the values to the above data members as follows:
name="Bhagavan"; roll=1593; height=172.5; weight=60.4;

4.Create a member function readinput() to get the values from the above members

5.Create a member function displaydata() to print the information collected from the students.

6.Create two objects s1 and s2.Call the member function readinput() only with s1 and displaydata() with s1 and s2.

Refer sample testcases

Note:

Programming Language need to be used:C++.

Source Code

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

class student{
  public:
 int roll;
   string name;
   double height,weight;
   student(){
     name="Bhagavan";
       roll=1593;
       height=172.5;
       weight=60.4;
   }
   void readinput(){
     cin >> name >> roll >> height >> weight;
   }
   void displaydata(){
     cout << name << " " << roll << " " << height << " " << weight << endl;
   }
};

int main() {
   student s1,s2;
   s1.readinput();
   s1.displaydata();
   s2.displaydata();
 return 0;
}
```

Sample Input

```
Manikandan 156 168.5 65.3
```

Sample Output

```
Manikandan 156 168.5 65.3
Bhagavan 1593 172.5 60.4
```

Result

Thus, Program " **Bhagavan the Inspirational Teacher** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:26:21 **Register Number:** RA1911026010033

Q. Calculation

Jagan the faculty of SRM has given the task to his student to calculate the simple compound interest with necessary exception handling functions.
Mandatory:
Use keyword try, catch and throw
Refer sample input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
   float a, b,c;
   try{
      cin >> a >> b >> c;
      if(cin){
         float answer = a *pow((1 +b/100),c);
         cout<<"Compound Interest is:"<<answer-a;
      }else{
         throw(false);
      }
   }catch(bool){
     cout<<"Invalid input. Try again";
   }
   return 0;
}
```

Sample Input

```
12
12
12
```

Sample Output

```
Compound Interest is:34.7517
```

Result

Thus, Program " **Calculation** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:25:20 **Register Number:** RA1911026010033

Q. Check input

Vidya mam given the task to student to find the given number is integer or float
If it is not a number then it should print Invalid input
Mandatory:
Use the keyword try, catch and throw.
Refer Testcase input and output.

Source Code

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

int main()
{
    int nr = 0; char ch;
 try
 {
    cin >> nr;
   if(cin)
   {
    cin.get(ch);
    if(ch=='.')
    {
        cout << "Floting" << endl;
    }
    else
    {
         cout << "Integer" << endl;
    }
   }
   else
   {
   throw nr;
        }
   }
   catch(int nr)
    {
      cout<<"Invalid input";
    }
 return 0;
}
```

Sample Input

3

Sample Output

Integer

Result

Thus, Program " **Check input** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:29:11 **Register Number:** RA1911026010033

Q. Checking Valid Data

Bogar was given a task to check whether the entered mark is valid or not. Bogar framed three rules for checking the validity of the mark
Rule 1: The mark should be greater than 0 and less than or equal to 100 [0 < m <=100]
Rule 2: The mark should not exceed 100.
Rule 3: No negative Marks
Rule 4: It should be a valid integer number
Kindly help Bogar - the Tamil SIDDHAR to perform the operations using exceptional handling.
Mandatory:
Use exceptional handling keywords try and catch for develop this program. Otherwise you wont get evaluated

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int marks;
    cin >> marks;
    try{
        if(0 < marks && marks <= 100){
            cout << "Valid Mark\n";
        }else{
            throw(false);
        }

    }catch(...){
        cout << "Invalid Mark\n";
    }
    return 0;
}
```

Sample Input

125

Sample Output

Invalid Mark

Result

Thus, Program " **Checking Valid Data** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 15:50:59 **Register Number:** RA1911026010033

Q. Compare Distance

Ashu is supposed to compare distances but he is to lazy to use the relational operators so many times.
So,he plans to overload the <(less than) operator,can you help min to complete his task?
Input:
First Line contains First Distance(Feet and Inches separated by space)
Second Line contains Second Distance(Feet and Inches separated by space)
Mandatory:
1.Create a class Distance(feet,inches)
2.Overload operator < to perform all three actions of greater than,less than and equal to.
3.Create a method named "displayDistance" to display the result.
Refer Sample test cases.
Programming language need to be used:C++

Source Code

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

class Distance{
  public:
 int feet1,inches1,feet2,inches2;
   Distance(int a,int b,int c,int d){
  feet1 = a;
       inches1 = b;
        feet2 = c;
        inches2 = d;
   }

   void displayDistance(){
     ;
   }

    void operator <(int a){
      if(feet1>feet2)
        cout<<"First One is Greater";
     else if(feet1==feet2 && inches1>inches2)
        cout<<"First One is Greater";
     else if(feet1 < feet2)
        cout<<"Second One is Greater";
     else if(feet1==feet2 && inches1 < inches2)
        cout<<"Second One is Greater";
     else if(feet1==feet2 && inches1 == inches2)
       cout<<"Both are equal";
    }
};

int main(){
  int a,b,c,d;
  cin >> a >> b >> c >> d;
  Distance obj(a,b,c,d);
  obj.displayDistance();
  obj.operator <(a);

 return 0;
}
```

Sample Input

```
10 13
10 16
```

Sample Output

```
Second One is Greater
```

Result

Thus, Program " **Compare Distance** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:28:20 **Register Number:** RA1911026010033

Q. Compare two string

Ravi is given the two string and ask the student to compare and find exception for given strings with necessary exception handling functions
Mandatory:
Use the keyword try, catch and throw.
Refer Testcase input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    string a = "-1",b = "-1";
    cin >> a >> b;
    try{
        if(a == b){
            cout << a << " is " << b << endl;
        }else if(a == "-1" || b =="-1"){
            throw(true);
        }else{
            cout << a << " is not " << b << endl;
        }
    }catch(...){
        cout << "Invalid input Try again\n";
    }
    return 0;
}
```

Sample Input

```
srm
sr
```

Sample Output

```
srm is not sr
```

Result

Thus, Program " **Compare two string** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:53:33 **Register Number:** RA1911026010033

Q. Complex Game

Rahul and Kuldeep plays a mathematical game with each other.
The game is all about complex numbers.Where they have to ask for real and imaginary part of two complex numbers, and display the real and imaginary parts of their sum.
Mandatory:
1.Create a class "Complex"
2.Create a CONSTRUCTOR to get the values of real and imaginary part of complex number.
3.Create a member function addcomplex() to add the real and imaginary values of complex number.
4.Create a member function displaycomplex() to display the result after addition.
5.Create an object as 'obj' for the class Complex. Call the member function addcomplex() and displaycomplex() using 'obj' from the main function.
Refer sample testcases..
Note:
Programming Language need to be used:C++

Source Code

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

class complex{
  public:
 int r1,r2,i1,i2,an1,an2;
   complex(){
     cin >> r1 >> i1 >> r2 >> i2;
       an1 = 0;
        an2 = 0;
   }
   void addcomplex(){
     an1 = r1 + r2;
       an2 = i1 + i2;
   }
   void displaycomplex(){
     cout << r1 << "+" << i1 << "i" << endl;
       cout << r2 << "+" << i2 << "i" << endl;
       cout << an1 << "+" << an2 << "i" << endl;
   }

};


int main() {
 complex obj;
   obj.addcomplex();
   obj.displaycomplex();
 return 0;
}
```

Sample Input

```
10 5
5 3
```

Sample Output

```
10+5i
5+3i
15+8i
```

Result

Thus, Program " **Complex Game** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:03:09 **Register Number:** RA1911026010033

Q. Concatenate

Your task is to Concatenate two given strings using Overloading + operator.
Mandatory:
1. Create the class name as "concatenate".
2. Declare public data member and define the variable.
3. Using the function read() to get the input string.
4. Define the functions "operator +" and access the looping to concatenate the strings.
5. Create an object named "obj" for the concatenate class.
6. Access the function read() using the object of concatenate class and print the result in main method.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class concatenate{
   public:
      string answer,a;
      void read(){
         cin >> answer >> a;
      }
      void operator +(concatenate &){
         answer = answer + a;
      }
};

int main(){
   concatenate obj;
   obj.read();
   cout <<  (obj.answer =  obj.answer + obj.a ) << endl;
   return 0;
}
```

Sample Input

```
Happy
Programming
```

Sample Output

```
HappyProgramming
```

Result

Thus, Program " **Concatenate** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:46:18 **Register Number:** RA1911026010033

Q. Counselling

In an application entry slip the admission cell of Educational Institute seeks basic details.
In which dad has to tell his name, mother name also his son's counselling cut off marks.
Display all the details using sub class object by Interface Concept.
Note:
1. Create a class named "Student" and declare methods getDetails() and displayDetails() of void return type and has no arguments
2. Create a class "StudentDetails" that implement "Student" interface and the methods of the interfaces
3. Create instance in the main class for "StudentDetails" as "sd" that invokes the methods in the "StudentDetails" class

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Student{
   public:
   string name1,name2;
   float marks;
      void getDetails(){
         cin >> name1 >> name2 >> marks;
      }
      void displayDetails(){
         cout << name1 << endl;
         cout << name2 << endl;
         cout << marks << endl;
      }
};

class StudentDetails:public Student{

};

int main(){
   StudentDetails sd;
   sd.getDetails();
   sd.displayDetails();
   return 0;
}
```

Sample Input

```
Jayaraman
Vani
193.45
```

Sample Output

```
Jayaraman
Vani
193.45
```

Result

Thus, Program " **Counselling** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:20:11 **Register Number:** RA1911026010033

Q. Database Administrator

Dhiya have been given a task to manage student database which has student names.
Take input from user the student name and print it along with the default value "New Student" using Constructor Overloading Concept.
Mandatory:
1.Create a new class named "StudentData"
2.Create a constructor for the class "StudentData"
3.Create a variable name "stuName" to get the default string and also get the new name of the student from the user.
4.Create a object named "myobj" and "myobj2" for the class "StudentData" in the main class "TestClass".
5.Access the "StudentData" class from the main class to print the default name and the user inputted student name
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include<string.h>
using namespace std;

class StudentData
{char stuName[50];
  public:
 StudentData()
  {
   cout<<"Student Name is: New Student"<<endl;
 }
 StudentData(char *n)
 { strcpy(stuName,n);
  cout<<"Student Name is: "<<stuName;}
};

  class TestClass
{ char n[50];
 public:
 TestClass()
 {StudentData myobj;
  cin>>n;
  StudentData myobj2(n);}
};

int main() {
 TestClass t;
 return 0;
}
```

Sample Input

```
Harsh
```

Sample Output

```
Student Name is: New Student
Student Name is: Harsh
```

Result

Thus, Program " **Database Administrator** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:52:43 **Register Number:** RA1911026010033

Q. DATE CLASS

Create C++ program that class named "Date" a which contains member variable day, month, year. For initialization purpose constructor should be used.
Example : int day,month,year;
Write necessary member functions to accept and display a date using >> and << operators.

Source Code

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

class Date{
   public:
   int day,month,year;
   Date(){
     cin >> day >> month >> year;
    }
   void getDate(){
     string arr[13] = {"a","January","February","March","April","May","June","July","August","September","October","November","December"};
       cout << arr[month] << " " << day << " " << year << endl;
    }
};

int main() {
 Date day;
   day.getDate();
 return 0;
}
```

Sample Input

23 12 2016

Sample Output

December 23 2016

Result

Thus, Program " **DATE CLASS** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:06:09 **Register Number:** RA1911026010033

Q. Decimal Decrement

Your task is to overload the prefix decrement operator ++ to decrement the digit after decimal.
Mandatory:
1. Create a class named as "Decimal"
2. Declare the public data member and define the member variable.
3. Use the function named as "operator --()" of void type to increase the decimal value.
4. Create an object named "obj" for the Decimal class.
5. Access the function "operator --()" using the object of Decimal class and print the result in main method.
Refer Sample test cases.
Programming language need to be used:C+

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Decimal{
    public:
        double number;
        void getx(){
            cin >> number;
        }
        void operator --(){
            number -= 0.1;
            cout << number << endl;
        }
};

int main(){
    Decimal obj;
    obj.getx();
    obj.operator --();
    return 0;
}
```

Sample Input

17.8

Sample Output

17.7

Result

Thus, Program " **Decimal Decrement** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:05:46 **Register Number:** RA1911026010033

Q. Decimal Increment

Your task is to overload the prefix increment operator ++ to increment the digit after decimal.
Mandatory:
1. Create a class named as "Decimal"
2. Declare the public data member and define the member variable.
3. Use the function named as "operator ++()" of void type to increase the decimal value.
4. Create an object named "obj" in main for the Decimal class.
5. Access the function "operator ++()" using the object of Decimal class and print the result in main method.
Refer Sample test cases.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Decimal{
    public:
        double number;
        void getx(){
            cin >> number;
        }
        void operator ++(){
            number += 0.1;
            cout << number << endl;
        }
};

int main(){
    Decimal obj;
    obj.getx();
    obj.operator++();
    return 0;
}
```

Sample Input

12.7

Sample Output

12.8

Result

Thus, Program " **Decimal Increment** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:17:26 **Register Number:** RA1911026010033

Q. Deque

Given a set of arrays of size N and an integer K, you have to find the maximum integer for each and every contiguous subarray of size K for each of the given arrays.
Input Format
First line of input will contain the number of test cases T.
For each test case, you will be given the size of array N and the size of subarray to be used K.
This will be followed by the elements of the array Ai.
Output Format
For each of the contiguous subarrays of size K of each array, you have to print the maximum integer.
Mandatory:
1. Should Use "deque" class
2. Use "push_back" and "pop_back" function of deque class
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <cstdio>
#include <deque>
#include <algorithm>
#include <iostream>

using namespace std;

int a[1000000];
int x[1000000], y[1000000];
deque<int> dq2;

int main()
{
 int T;
    cin >> T;
 while(T--){
  dq2.clear();
  int n, k;
  scanf("%d %d", &n, &k);

  for (int i = 0; i < n; i++) scanf("%d", a + i);

  for (int i = 0; i < k - 1; i++){

   while (dq2.size() && a[dq2[dq2.size() - 1]] <= a[i]) dq2.pop_back();
   dq2.push_back(i);
  }

  for (int i = 0, j; (j = i + k - 1) < n; i++){
   while (dq2.size() && a[dq2[dq2.size() - 1]] <= a[j]) dq2.pop_back();
   dq2.push_back(j);

   y[i] = a[dq2[0]];
   if (dq2[0] == i) dq2.pop_front();
  }

  for (int i = 0; i <= n - k; i++) printf("%d%c", y[i], i == n - k ? '\n' : ' ');
 }
 return (0);

}
```

Sample Input

```
2
5 2
3 4 6 3 4
7 4
3 4 5 8 1 4 10
```

Sample Output

```
4 6 6 4
8 8 8 10
```

Result

Thus, Program " **Deque** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:05:25 **Register Number:** RA1911026010033

Q. Dhoni and Ziva in Chennai

Dhoni's daughter Ziva is hyper active child,so she used to ask lot of question to Dhoni while playing with him.
One fine evening Dhoni and Ziva were palying in Chepak Stadium in Chennai,at that time ziva looking at the Moon in sky asked Dhoni what is the gravity in moon? Dhoni said it's 16.6 percentage that of earth.
Ziva didn't got satisfied with that then she asked what will be my weight in moon?
Dhoni was little bit confused to answer ziva !!!!!
Can you help Dhoni to answer the question by creating a logic which calculates the weight of the person in moon so that Ziva will be happy knowing her weight.
Input Format:
Get the actual weight of the person
Output Format:
Print the weight in moon.
Refer Sample Testcases.
Programming Language need to be use:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
 double weight;
   cin >> weight;
   cout <<"Your weight on moon is : " << weight * 0.166 << endl;
 return 0;
}
```

Sample Input

17

Sample Output

Your weight on moon is : 2.822

Result

Thus, Program " **Dhoni and Ziva in Chennai** " has been successfully executed

Course: OOPS | **Session:** Function and Constructor Overloading | **Timestamp:** 2020-10-30 16:22:10 | **Register Number:** RA1911026010033

Q. Dhoni the CEO

Dhoni is the CEO of the company in Ranchi and he have to manage all the salaries of employees.
He is finding it bit difficult to manage that because of his national duties as Indian Cricketer.
He is interested in automating the salary credit process of his employees.
So he is looking for the software which credits the default salary to the employees and get the feedback from the employee "Expected Salary" so that Dhoni can know the expectations of his employees.
Use the Contructor Overloading Concept to develop what Dhoni expects..
The Default Salary of employees is 10000.
Can you help Dhoni?
Mandatory:
1.Create a new class named "Salary"
2.Create a constructor for the class "Salary"
3.Create a variable name "deftsalary" to get the default salary and also get the expected salary of the employee.
4.Create a object named "myobj" for the class "Salary" in the main class.
5.Access the "Salary" class from the main class to print the default salary and the employee expecting salary.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class TestClass
{
  public:
class Salary
{
  public:
  Salary()
  {
    int deftsalary;
    deftsalary=10000;
    cout<<deftsalary<<endl;
  }
  Salary(int ExpectedSalary)
  {
    cin>>ExpectedSalary;
    cout<<ExpectedSalary<<endl;
  }
};
};
int main()
{
  TestClass::Salary myobj;
  int ExpectedSalary;
  cin>>ExpectedSalary;
  TestClass::Salary myobj2(ExpectedSalary);
  return 0;
}
```

Sample Input

```
17500
```

Sample Output

```
10000
17500
```

Result

Thus, Program " **Dhoni the CEO** " has been successfully executed

Course:	Session:	Timestamp:	Register Number:
OOPS	Abstract Class Virtual Function and Friend Function	2020-10-30 15:35:20	RA1911026010033

Q. Difference Problem

Mandatory:
1. Create an Abstract class as "parent"

2. Declare a virtual function as public member as following:
Hint : virtual void difference(int a, int b)=0;

3. Create a child class as "derived" by inheriting "parent" class
Hint : class child:public parent

4. Define the difference() function in Derived class with two parameter
a. Function Name = difference()
b. Return type = void()
c. Argument = Two argument of type integer
d. Usage = To display the difference of two values.

In main method:

1.Create pointer instance for base class: parent *p;

2. Create an instance for derived class: child c;

3. Assign the address of d to pointer b:
Hint: p=&c;

4. Declare a variable and read it:
Hint: int n; cin>>a>>b;

5. Call the sum function using b:
Hint: p->difference(a,b);

Refer Sample testcases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class parent{
   public:
      virtual void difference(int a, int b)= 0;
};

class child:public parent{
   public:
      void difference(int a,int b){
         cout << "Difference=" << a-b << endl;
      }
};

int main(){
   parent *p;
   child c;
   p = &c;
   int a,b;
   cin >> a >> b;
   p->difference(a,b);
   return 0;
}
```

Sample Input

```
189 172
```

Sample Output

```
Difference=17
```

Result

Thus, Program " **Difference Problem** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 18:43:22 **Register Number:** RA1911026010033

Q. Digital Library

Tamilnadu Educational Minister has ordered the Director of Higher education to make the Libraries in Government schools advanced.

So they are planning to create a software which keeps track of the books availability and respond to students request for books.

Can you help the government to do this?

Mandatory:

1.Create a class "library"

2.Create the following datamembers:
a)name
b)roll number,
c)book code and
d)counter

3.Create a PARAMETERIZED CONSTRUCTOR to initialize the values to the above data members.

4.Create a member function show() to display the details of the book

5.Create a member function count() to display counter value.

6.Create two objects lib1 and lib2. Assign values to the members using parameterized constructor.

Note:
Use implicit method of call for first object and explicit method of call for second object and display the details using show function.

Let counter variable be a static member of the class.

Input Format:
The first line of the input must contain a single space separated roll number, name and book code.
The first line of the input is also a single space separated roll number, name and book code.
Both lines of input must be passed to parameterized constructor.

Output Format:
Print the details of both objects.

Refer sample testcases..

Note:

Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class library
{
   public:
   string name;
   int roll,bc,c=0;
   library(int r,string nam,int bookcode){
      name = nam;
      roll = r;
      bc = bookcode;
   }
   void show(){
      cout<<"Roll No:"<<roll<<endl<<"Name of the Student:"<< name<<endl<<"Code of Book Accessed:"<<bc<<endl;
   }
   void count()
   {
      c++;
   }
};

int main(){
   int rol,boco,rol2,boco2;
   string name1, name2;
   cin>>rol>>name1>>boco>>rol2>>name2>>boco2;
   library lib1(rol,name1,boco);
   lib1.show();
   library lib2(rol2,name2,boco2);
   lib2.show();
   return 0;
}
```

Sample Input

```
7 Dhoni 531
13 Raina 578
```

Sample Output

```
Roll No:7
Name of the Student:Dhoni
Code of Book Accessed:531
Roll No:13
Name of the Student:Raina
Code of Book Accessed:578
```

Result

Thus, Program " **Digital Library** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:05:20 **Register Number:** RA1911026010033

Q. Distance

Your task is to add two distances using binary plus (+) operator overloading concept.
Input format:
Get the two feet and inch values
Mandatory:
1. Create a class name as "Distance".
2. Declare the public and private data member function and define the member variable.
3. Declare the function "readDistance(void)" of void type with argument type void to get input variable.
4. Use the function as "operator +" to add the two objects.
5. Access the function of "dispDistance()" of type void using the object and print the result in main method.
Output Format:
Print the sum of feet and inch values.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Distance
{
   private:
      int feet,inches;

   public:
      void readDistance(void){
         cin >>feet;
         cin >>inches;
      }

      void dispDistance(){
         cout << "Feet:" << feet << " " << "Inches:" << inches << endl;
      }
      Distance operator +(Distance &dist1){
         Distance tempD;
         tempD.inches= inches + dist1.inches;
         tempD.feet  = feet   + dist1.feet + (tempD.inches/12);
         tempD.inches=tempD.inches%12;
         return tempD;
      }
};
int main(){
   Distance D1,D2,D3;
   D1.readDistance();
   D2.readDistance();
   D3=D1+D2;
   D3.dispDistance();
 return 0;
}
```

Sample Input

```
20
10
30
15
```

Sample Output

```
Feet:52 Inches:1
```

Result

Thus, Program " **Distance** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:40:06	**Register Number:**
OOPS			RA1911026010033

Q. District Sports Meet

Jagadeshvaran the Physical Trainer in Thanjavur Govt School is finding participants in various sports for the district level sports meet.He cant able to collect those data manual which is tedious.
Can you help him collecting the student details such as student name and registration number so that Jagadeshvaran can process the application of sports meet soon.
Mandatory:
1.Create a class named "Sports"
2.Create a virtual function named "getdata" of type void.
3.Create a virtual function named "display" of type void.
4.Create a class "Student" derived from class "Sports"
5.Invoke the virtual function getdata() and display() from the Sports class.
6.Display the result in the main method.
Refer sample testcases.
Programming language need to be used is :C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Sports{
   public:
      string roll;
      virtual void getdata(){
         cin >> roll;
      }
      virtual void display(){
         cout << "Student Roll no is: " <<  roll << endl;
      }
};

class Student:public Sports{
   public:
      string name;
      void getdata(){
         cin >> name;
      }
      void display(){
         cout << "Student Name is: " << name << endl;;
      }
};

int main(){
   Sports obj;
   obj.getdata();
   Student oo;
   oo.getdata();
   oo.display();
   obj.display();
   return 0;
}
```

Sample Input

```
2018100777
Mahi
```

Sample Output

```
Student Name is: Mahi
Student Roll no is: 2018100777
```

Result

Thus, Program " **District Sports Meet** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:26:52 **Register Number:** RA1911026010033

Q. Divide by zero exception

Ravi is assign the task to his student to Write a program for input numerator and denominator and display their result of division.
The program should generate an exception if the denominator is zero.
Input:
Numerator:
12
Denominator:
0
Output:
INVALID:
Exception: 0

Mandatory:

Use the keyword try, catch and throw.

Refer Testcase input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int a,b;
    cin >> a >> b;
    try{
        if(b!=0){
            cout << "VALID" << endl;
        }else{
            throw(0);
        }
    }catch(...){
        cout << "INVALID: Exception: 0";
    }
    return 0;
}
```

Sample Input

```
2
3
```

Sample Output

```
VALID
```

Result

Thus, Program " **Divide by zero exception** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:26:38 **Register Number:** RA1911026010033

Q. User defined Exception - Division

Create an custom - user defined exception for Division of two numbers.

1. Include the header file "exception".

2. Create a class "Divide_By_Zero_Exception" that inherits "exception" base class.

3. Declare the what() method and create custom exception as follows:
public:
const char * what() const throw() {
return "Divide By Zero Exception"; }

4. In main method, input the two numbers and if the second value is "ZERO" then throw the exception.
Hint: Divide_By_Zero_Exception d;
throw d;

Kindly use same object name for the class "Divide_By_Zero_Exception" as "d"

5. Use what() method to display the message and the object name for exception class should be "e".
Hint: catch(exception& e) {
cout << e.what(); }

Refer sample input and Output

Use exceptional handling keywords try and catch for develop this program. Otherwise you wont get evaluated.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
using namespace std;
class Divide_By_Zero_Exception : public exception
{
  public:
  const char * what() const throw() {
    return "Divide By Zero Exception";}
};
int main()
{
try{
    int a, b;
    cin>>a>>b;
    if(b!=0){
        cout<<a/b;

    }else{
       Divide_By_Zero_Exception d;
      throw d;
    }
  }
  catch(exception& e){
    cout<<e.what();
  }
  return 0;
}
```

Sample Input

```
10
0
```

Sample Output

```
Divide By Zero Exception
```

Result

Thus, Program " **User defined Exception - Division** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:14:32 **Register Number:** RA1911026010033

Q. Remove Duplicate

Manasvi the technical head of the training centre in Chennai has planned to conduct the surprise test for his students.
She has given the task of removing the duplicate elements from a sorted linked list.
But she has imposed the following restriction to the students.
Mandatory:
Should use "push_back" function and "unique" function of "list" library of Standard template library.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include <list>

using namespace std;

int  main() {
 list <int> m;
 int n;
 cin >> n;
 int x;
 for (int i=0; i<n; i++) {
  cin >> x;
  m.push_back(x);
 }
 m.unique();
 for (auto v:m)
  cout << v << " ";
 return 0;
}
```

Sample Input

```
15
5 5 5 5 7 9 9 10 11 11 12 15 15 18 18
```

Sample Output

```
5 7 9 10 11 12 15 18
```

Result

Thus, Program " **Remove Duplicate** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:47:39 **Register Number:** RA1911026010033

Q. Fill Water

Yash have to fill water in a box (cuboid) in shape.
Initialize Length,breadth,height to 0. Print the initial volume and then take input from the user the parameters of cuboid,based on the values calculate the volume of the water in the cuboid and print it.
Use the Constructor Overloading Concept to develop to do this.
Mandatory:
1.Create a new class named "Box"
2.Create a constructor for the class "Box"
Box(double samevalue)
3.Create a function named "volume" of type double.
4.Create a object named "mybox1" and "mybox2" for the class "Box" in the main class "TestClass".
5.Access the "Box" class from the main class to print the initial volume and the newly calculated volume of water in cuboid.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Box{
   public:
      int length;
      Box(){
         length = 0;
      }
      Box(double samevalue){
         length = samevalue;
      }
      double volume(){
         return pow(length,3);
      }
};

int main(){
   Box mybox1;
   cout << mybox1.length << endl;
   double length;
   cin >> length;
   Box mybox2(length);
   cout << mybox2.volume() << endl;
   return 0;
}
```

Sample Input

```
12
```

Sample Output

```
0
1728
```

Result

Thus, Program " **Fill Water** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:24:42 **Register Number:** RA1911026010033

Q. Finding Alphabets

Siva the teacher of maths is given the task to his student , write a program to calculate the checking alphabet with necessary exception handling functions

Mandatory:

Use the keyword try, catch and throw.

Refer Testcase input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    char a,b;
    cin >> a >> b;
    try{
        if('A'<=a &&'Z'>=a || 'a' <= a && 'z' >= a){
            cout << "character "<< a << " is alphabetic " << endl;
           throw(b);
        }

    }catch(char b){
        cout << "character "<< b << " is not alphabetic " << endl;
    }
    return 0;
}
```

Sample Input

```
C+
```

Sample Output

```
character C is alphabetic
character + is not alphabetic
```

Result

Thus, Program " **Finding Alphabets** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:47:14 **Register Number:** RA1911026010033

Q. friends in maths tution

Mandatory:
1. Create a base class named "A"
2. Create and define the member function "display()" to get the number of pens as input and to display it.
3. Create a base class named "B"
4. Create and define the member function "display()" to get the price of the single pen as input and to display it.
5. Create the class named "C" derived from "A" and "B".
4. Create and define the member function "display()" calculate the total price of the pens.
6. Declare the object for the derived class "C" named "sample" and call the display() functions of Class A and B and C from the main method to display the result.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class A{
public:
  int pen;
  void display(){
  cin>>pen;
  }
};
class B{
public:
  int price;
  void display(){cin>>price;}
};
class C:public A,public B{
public:
  void display(){
   A::display();
    B::display();
    cout<<pen*price;
  }
};
int main() {
    C sample;
   sample.display();
    return 0;
  }
```

Sample Input

```
5
100
```

Sample Output

```
500
```

Result

Thus, Program " **friends in maths tution** " has been successfully executed

Course: OOPS | **Session:** Function and Constructor Overloading | **Timestamp:** 2020-10-30 16:19:47 | **Register Number:** RA1911026010033

Q. Hospital Bill

One of the famous politician was admitted in one of the famous hospital in chennai.Since the politician is one of the icon of the politics she has been given one of the best facilities available in the hospital.

The politician was admitted in the hospital for more than a month so hospital wanted to calculate the Bill for Rooms and Medicines every week.

Use Function Overloading to calculate the bills by taking into account the the expenses and number of days

Mandatory:

1.Create a class named "Hospital"

2.Create a function named "bill" under the class "Hospital" of type float with two parameter as "medicines" and "days" to get the total amount bill amount for medicines.

float bill(float medicines, float days)

3.Overload the "bill" function with "room" and "days" respectively to the bill amount for room.

Note:Name of the variables should be "room" and "days" of type int.

4.Create the objects "ob" for the "Hospital" class.Access the function "bill" using the object name from the main class to print the medicine and room expenses of the politician in the hospital for a week.

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Hospital
{
  public:
    int bill(int room, int days)
    {
      long tot;
      tot=room*days;
      return tot;
    }
    float bill(float medicines, float days)
    {
      long tot;
      tot=medicines*days;
      return tot;
    }
};
int main() {
    Hospital ob;
    int medicines,rooms,days;
    cin>>medicines>>days>>rooms>>days;
    cout<<endl<<ob.bill(medicines,days);
    cout<<endl<<ob.bill(rooms,days);
    return 0;
}
```

Sample Input

```
5000
7
15000
7
```

Sample Output

```
35000
105000
```

Result

Thus, Program " **Hospital Bill** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:16:46 **Register Number:** RA1911026010033

Q. Ice Cream Seller

An ice-cream stall sells both green tea and mocha ice cream.
A small portion of either costs $0.75 and a large portion costs $1.25.
During a short period of time, the number of ice creams sold is taken as a matrix(2*2) which contains the no of small and large portions of both flavours.
Find out the sales of the green tea and mocha flavour.
Mandatory:
1. class name is matrix
2. Overload the operator * as follows
matrix operator *
3. Create a method named "get" of type void to get the inputs.
4. Create a method named "put" of type void to print the outputs.
Input Format:
Input:First and Second line contains the small and large portion of green tea.
Third and Fourth line contains the small and large portion of mocha.
Fifth and sixth line contains the price of small and large portion respectively.

Source Code

```
#include <iostream>
using namespace std;
class matrix
{
   int a, b, c, d;
   float e, f, z, r;

public:
   void get()
   {
      cin >> a >> b >> c >> d >> e >> f;
   }
   matrix operator *()
   {
      float x, y, z, p, q, r;
      x = a * e;
      y = b * f;
      p = c * e;
      q = d * f;
      z = x + y;
      r = p + q;
     cout << z << endl
          << r;
   }
   void put()
   {

   }
};
int main()
{
   matrix obj;
   obj.get();
   *obj;
   obj.put();
   return 0;
}
```

Sample Input

```
3
4
6
3
0.75
1.25
```

Sample Output

```
7.25
8.25
```

Result

Thus, Program " **Ice Cream Seller** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:49:58 **Register Number:** RA1911026010033

Q. Interface for Rectangle

Develop a cpp program for calculating Area and Perimeter of the Rectangle uing "multiple inheritance"
Mandatory:
1.Create a class with name "Area"
a. Declare the method getArea() with type float that takes 2 arguments of type float and the name of the arguments should be "l" and "h" respectively of type float.
2.Create an class with name "Perimeter"
a. Declare the method getPerimeter() with type float that takes 2 arguments of type float.
3.Create a class named "Rectangle" that implements the multiple inheritance "Area" and "Perimeter" and calculate the area and perimeter of the rectangle using getArea() and getPerimeter() methods.
4.Create an objectname "d" for the Rectangle class in main method and access the methods "getArea" and "getPerimeter" from the main method of the main class.
Note: avoid spaces for example xxx yyy:ccc fff,ddd and yyy();
Refer Sample Testcases:

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Area{
   public:
      float getArea(float l,float h){
        return l * h;
      }
};

class Perimeter{
   public:
      float getPerimeter(float l,float h){
        return 2*(l + h);
      }
};

class Rectangle:public Area,public Perimeter{
   public:

};

int main(){
   Rectangle d;
   float a,b;
  cin >> a >> b;
   cout << setprecision(2) << fixed <<  d.getArea(a,b) << endl;
   cout << setprecision(2) << fixed << d.getPerimeter(a,b) << endl;
   return 0;
}
```

Sample Input

```
7.7
4.9
```

Sample Output

```
37.73
25.20
```

Result

Thus, Program " **Interface for Rectangle** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:49:01 **Register Number:** RA1911026010033

Q. Inner and Outer

Construct a class called â€œouterâ€ representing a member x and a member function get() to read the value of x.
Create another class â€œinnerâ€ inside the class â€œouterâ€ with member y and the following member functions:
get(): to read the value of x.
sum(): to calculate and print the sum of x (outer class) and y (inner class).
Note:
Create object for outer class inside inner class.
Call get() using outer class object to read the value of x.
Create inner class object inside main function.
Call get() and sum() using inner class object.
Input:
First line: value of x.
Second line: value of y.
Output:
The output must print the sum of x and y.
Refer Sample Testcases

Source Code

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

class outer{

  public:
   int x;
   void get(){
     cin >> x;
    }

    class inner{
       public :
           void get(){
               cin >> y;
           }
           void sum(){
                outer a;
                a.get();
                cout << a.x + y;
             }
           int y;

       };
};

int main(){
   outer::inner b;
   b.get();
   b.sum();
 return 0;
}
```

Sample Input

```
2719
3187
```

Sample Output

```
5906
```

Result

Thus, Program " **Inner and Outer** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:05:12 **Register Number:** RA1911026010033

Q. IOST1

You work in tourism company and now you want sale the available tickets in offer price. the company announced a offer for touring package.
Many of the IT employees formed the group to get all tickets in offer price. now company faced a critical situation to sale the tickets over the crowd from IT industry.
The management of tourism company decided to allocate some percentage of seats for IT employees. now tourism company decided to conduct a online test for all IT employees.
One of the question for online test was, they have to use IO stream concepts to read the array of character from user.
The input should contains collection of character (like sentences).
The input strings should be ends with floating point number followed by single space (.)dot.
Mandatory:
You should used IO Streams Concept only then you will get evaluated to 100%.
my_stream.seekg(-7,ios::end);
stringstream my_stream(ios::in|ios::out);
std::string dat(a);
Refer Sample Test Cases

Source Code

```
#include <iostream>
#include <sstream>
#include <string>
using namespace std;
int main() {
string a;
getline(cin,a,':');
float f;
cin >> f;
stringstream my_stream(ios::in|ios::out);
my_stream << a;
my_stream.seekg(-7,ios::end);
std::string dat(a);
cout << "I have a double : " << f*f;
return 0;
}
```

Sample Input

I have a double : 74.7 .

Sample Output

I have a double : 5580.09

Result

Thus, Program " **IOST1** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:06:30 **Register Number:** RA1911026010033

Q. IOST2

you have a task to set padding for integers. For this concepts, you have to mandatorily use the following default functions "setw(10)", "setfill('0')" and " "setfill('.');" padding refers to the character used to fill in the unused space in an output field.- By default the pad character for justified output is the space (blank) character.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;
int main(){
    long long int number;
    cin >> number;
    cout<< "0123456789" << endl;
    cout<< setw(10) << number << endl;
    cout<< setw(10) << setfill('0')<< number << endl;
    cout<< setw(10) << setfill('.')<< number << endl;
    return 0;
}
```

Sample Input

```
123456
```

Sample Output

```
0123456789
    123456
0000123456
....123456
```

Result

Thus, Program " **IOST2** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:03:27 **Register Number:** RA1911026010033

Q. IOST3

Bamar is leading the fablab. He announced the recruitment process for newly joint engineering students. He received more applications than required application. So he asked the technical team to conduct online test. Technical team prepared a question like, user need to enter integer number and hexadecimal number. Finally the user need to display the integer number and eqivalent value of hexadecimal number. Mandatory declaration is "std::hex"

Source Code

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int a,s;
    cin >> a >> std::hex >> s;
    cout << "You have entered integer: " <<  a << endl;
    cout << "Equivalent value of given hexadecimal number is: " << s << endl;
}
```

Sample Input

```
5
6e
```

Sample Output

```
You have entered integer: 5
Equivalent value of given hexadecimal number is: 110
```

Result

Thus, Program " **IOST3** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:07:38 **Register Number:** RA1911026010033

Q. IOST6

Mariappan loves Quantitative Aptitude and is always curious to learn new things. Recently, he learned about c++ program the concept is to print count the number of characters in given string. Now teaches some sample programs in c++ concepts to his friends asking them to write the own program for count the number of characters. Mandatory declaration are "cin.getline" and "cin.gcount()"

Source Code

```
#include<bits/stdc++.h>
using namespace std;

int main(){
    char str[100];
    cin.getline(str,100);
    cout << "the number of characters extracted are:" << cin.gcount() << endl;
    return 0;
}
```

Sample Input

```
virtual
```

Sample Output

```
the number of characters extracted are:7
```

Result

Thus, Program " **IOST6** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:05:50 **Register Number:** RA1911026010033

Q. IOST8

This question will help you to study the concept of "istream_withassign class". This class is variant of istream that allows object assignment. The predefined object cin is an object of this class and thus may be reassigned at run time to a different istream object. User need to write a program, to get two integers from user and print the same as output. they have to use istream concepts to read the class with friend function.

Mandatory declarations of this program is "friend void operator>>", "operator >>"

Sample input ; 4 5
Sample output : dx=4 dy=5

Source Code

```
#include <iostream>
using namespace std;
class Time
{
private:
int hour, min;
public:
friend ostream & operator << (ostream &out, const Time &c);
friend istream & operator >> (istream &in, Time &c);
friend void operator >>(Time &hourw, Time &minw);
};
istream & operator>>(istream &in, Time &c)
{
in >> c.hour;
in >> c.min;
return in;
}
ostream & operator << (ostream &out, const Time &c)
{
cout << "dx="<< c.hour << " dy=" << c.min;
return out;
}
int main()
{
Time c1;
cin >> c1;
cout << c1;
return 0;
}
```

Sample Input

```
4 5
```

Sample Output

```
dx=4 dy=5
```

Result

Thus, Program " **IOST8** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:05:32 **Register Number:** RA1911026010033

Q. IOST12

Prof. Malarselvi conducting Student technical club coordinator recruitment for CSE department. Professor received many applications from students. Prof.Malarselvi decided to conduct written test for all applicants. One of the question was numerical number pattern like pyramid. For input output operations getline and write iostream method should be used.

Mandatory declarations are "cout.precision", "pi=(float)22/7"

Source Code

```
#include <iostream>
using namespace std;
int main() {
    double pi;
    pi=(float)22/7;
    int n; cin>>n; int i;
    for( i=n;i>0;i--){
        cout.precision(i);
        cout<<pi<<endl;
    }
    cout << endl;
    cout<<" previous Setting:" << 1;
 return 0;
}
```

Sample Input

```
15
```

Sample Output

```
3.14285707473755
3.1428570747375
3.142857074738
3.14285707474
3.1428570747
3.142857075
3.14285707
3.1428571
3.142857
3.14286
3.1429
3.143
3.14
3.1
3

 previous Setting:1
```

Result

Thus, Program " **IOST12** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:06:13 **Register Number:** RA1911026010033

Q. IOST13

Ganapathy is preparing for GATE exam. He got one reference book from his friend Anand. One of the cpp question was, the user need to print the string as right justification. Remaining empty symbol has to be filled as symbol "*". The output length should be 20.

Mandatory declarations are "cout.fill", "cout.width(20)"

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;
int main(){
    string a,b;
    cin >> a >> b;
    cout.width(20);
    cout.fill('*');
    cout << a << endl;
    cout.width(20);
    cout.fill('-');
    cout << b << endl;
    cout << endl;
    cout << "WEL DONE\n";
    return 0;
}
```

Sample Input

```
SRM
University
```

Sample Output

```
**********SRM
----------University

WEL DONE
```

Result

Thus, Program " **IOST13** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:04:53 **Register Number:** RA1911026010033

Q. IOST14

Professor Kalaivani conducting faculty recruitment for cse department. Professor received many applications from graduates. Prof.Kalaivani decided to conduct written test for all applicants. One of the question was numerical number pattern. For input output operations getline and write iostream method should be used.

Mandatory declarations are "cout.fill", "pi=(float)22/7", "cout.width","cout.precision".

Input : It specifies number of digits

Output: pattern for numerical number "Pi"

Source Code

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

int main()
{
int  n;
float pi;
cin >> n;
int i = 0;
int n1 = n;
while (n > 0)
{
pi=(float)22/7;
cout.precision(n);
cout << pi;
while (i)
{
cout << "*";
i--;
}
i = n1 - n + 1;
n--;
cout << endl;
}
cout << "3" << endl
<< "Fill Setting:*";

return 0;
}
void d()
{
cout.fill('a');
cout.width(10);
}
```

Sample Input

10

Sample Output

```
3.142857075
3.14285707*
3.1428571**
3.142857***
3.14286****
3.1429*****
3.143******
3.14*******
3.1********
3*********
3
Fill Setting:*
```

Result

Thus, Program " **IOST14** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:06:49 **Register Number:** RA1911026010033

Q. IOST17

Prof. Manoj conducting Student technical club coordinator recruitment for CSE department, Professor received many applications from students. Prof.Malarselvi decided to conduct written test for all applicants. One of the question was, the user need to get integer numbers and display the hexadecimal, Octal and Decimal number
Mandatory declarations are "cout.setf" , "ios::hex" ,"ios::oct" , "ios::dec"

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int number;
    cin >> number;
    cout.setf(ios::hex,ios::basefield );
    cout<<"Hexadecimal is:" << hex << number <<"\n";
    cout.setf(ios::oct,ios::basefield );
    cout<<"Octal is:"<< oct << number <<"\n";
    cout.setf(ios::dec,ios::basefield );
    cout<<"Decimal is:"<< dec <<number;
    return 0;
}
```

Sample Input

```
50
```

Sample Output

```
Hexadecimal is:32
Octal is:62
Decimal is:50
```

Result

Thus, Program " **IOST17** " has been successfully executed

Course: OOPS **Session:** IO Streams **Timestamp:** 2020-10-30 15:07:10 **Register Number:** RA1911026010033

Q. IOST19

Professor kannan conducting placement trainer faculty recruitment for cse department, Professor received many applications from graduates. Prof.Kannan decided to conduct written test for all applicants. One of the question was string pattern like pyramid. Input entered by user as integer and output displayed as pyramid.

Mandatory declarations are "cout.precision", "cout.setf", "ios::fixed", "cout.width"

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int size;
    cin >> size;
    int a = 1;
    long double answer = 1;
    for(int i = 1; i <= size; i++){
        answer = i * answer;
        cout.width(size);
        cout.setf(ios::fixed);
        cout.precision(0);
        cout << answer << endl;
    }
    return 0;
}
```

Sample Input

```
15
```

Sample Output

```
              1
              2
              6
             24
            120
            720
           5040
          40320
         362880
        3628800
       39916800
      479001600
     6227020800
    87178291200
  1307674368000
```

Result

Thus, Program " **IOST19** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:35:00	**Register Number:**
OOPS			RA1911026010033

Q. Jadeja and Googly

Ravindra jadeja one of the india's best spinner has a habit of bowling the googly on the odd number of balls of his over.So can you help him to find whether his next ball is to a googly or not?

Mandatory:

1. Create a class named "googly"
2. Create a method named "void getballnumber" to get the number of ball of the over.
3. Use the friend function named "isgoogly" of type int to decide weather the ball jadeja going to bowl is a googly or not.
4. Create a object named "e1" for class googly.
5. Access the friend function "isgoogly" using the object of googly class in the main method.

Refer Sample testcases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class googly{
   public:
      int number;
      void getballnumber(){
         cin  >> number;
      }
      friend int isgoogly();
};

int  isgoogly(class googly e1){
   if(e1.number % 2 != 0){
      cout << "Googly Ball" << endl;
   }else{
      cout << "Not a Googly Ball" << endl;
   }
};


int main(){
   googly e1;
   e1.getballnumber();
   isgoogly(e1);
   return 0;
}
```

Sample Input

```
5
```

Sample Output

```
Googly Ball
```

Result

Thus, Program " **Jadeja and Googly** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:42:06	**Register Number:**
OOPS			RA1911026010033

Q. Jaganath and his Juniours

Jaganath the Developer is trying to analyze the operation of Post increment.Fot that purpose he has give some of the tasks to his juniors in the team.

But he has the following restriction in doing that task

Mandatory:

1. Define a class name "Point" with one data member and three member functions. (Two functions and one constructor)

2. Define a parameterized Constructor for the class "Point" that takes one argument.

Name = Point()
Arguments = One Argument
Type = Integer
Usage = Assigns the value to the data member of the class
Hint: Point(int px)

3. Define a function named "show"

Name= show()
Arguments= default argument
Access specifier=public
type = void
Usage=Display the value of the data member.

4. Define a function overloading ++ operator(as friend Data type operator++(classname &))

Hint = friend void operator++(Point &

5. Define the operator overloading as follows:
Hint = void operator++(Point &p)

6. In main function create object for class "Point" and object name as "ob1" that takes one argument. [The Value to be Incremented]

7.Invoke show() method from main using the object "ob1".

Can you help they to complete the task given by Jaganath??

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Point{
   public:
      int a;
      Point(int x){
         a = x;
      }
      void show(){
         cout << a << endl;
      }
      friend void operator++(Point &p);
};

void operator++(Point &p){
   p.a = p.a + 1;
}

int main(){
   int x;
   cin >> x;
   Point ob1(x);
   operator++(ob1);
   ob1.show();
   return 0;
}
```

Sample Input

179

Sample Output

180

Result

Thus, Program " **Jaganath and his Juniours** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:37:31	**Register Number:**
OOPS			RA1911026010033

Q. Kajal and her Shopping

Kajal is the newly married women went to super market for his family shopping.Since she has purchased lot of items.There was a two separate bills given by the representative in super market.So kajal is interested in calculating the average amount she spent in the shopping.

Help her to find it.Get the total amount of two bills and find the average amount spent by kajal.

Mandatory:

1. Create a class named "Bill"
2. Create a method named "getamount" of type void to get the amount of two bills.
3. Use the friend function named "billavg" of type float to calculate the average amount spent for shopping.
4. Create a object named "obj" for class Bill.
5. Access the friend function "billavg" using the object of Bill class in the main method.

Refer Sample testcases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Bill{
   public:
      int amount,a2;
      void getamount(){
         cin >> amount >> a2;
      }
      friend float billavg();
};

float billavg(Bill obj){
   return(float)(obj.amount + obj.a2)/2;
}


int main(){
   Bill obj;
   obj.getamount();
    cout << "Average amount spent:"<< billavg(obj)<< endl;
   return 0;
}
```

Sample Input

```
1567
1965
```

Sample Output

```
Average amount spent:1766
```

Result

Thus, Program " **Kajal and her Shopping** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:33:16 **Register Number:** RA1911026010033

Q. Largest of Long

You are required to find the greatest of two numbers using function template
Mandatory:
1. Create a function template "template "
2. Declare a template Function as "GetMax" that takes three arguments of type long
3. Inside the function template find the greatest of two numbers and return the result to the main function.
4. In Main Function, input 3 long values
5. Invoke the template function and display the biggest of three numbers.
Input Format:
First Line Corresponds to long Values.
Output Format:
Display the greatest long number.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template <class T>
T GetMax(T a,T b, T c){
    return (max(max(a,b),c));
}

int main(){
    long a,b,c;
    cin >> a >> b >> c;
    cout << GetMax(a,b,c) << endl;
    return 0;
}
```

Sample Input

537354 835383 124

Sample Output

835383

Result

Thus, Program " **Largest of Long** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:31:07 **Register Number:** RA1911026010033

Q. Largest Number

Person A buys a share in NSE with the interest rate of x%. He is expecting to sell it when the interest rate raises beyond x%. The day the interest rate increases, A has sold his share for y%. Find the interest rate which A has sold his share.

Input:

1.Get the two integer values in first line of the input.

2.Get the two float values in second line of the input.

Mandatory:
1.Create a Template Class as
template

2. Create the "Large" template function that accepts two arguments n1 and n2 of integer and float type.

3.Call the Large function from the main method to display the largest number.

Output:

Display the output in the separate line to the separate data types.

Refer the following testcases.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>
T Large(T n1,T n2){
    T l = (n1 > n2) ? n1 : n2;
    return l;
}


int main(){
    for(int i = 0; i < 2; i++){
        float a,b;
        cin >> a >> b ;
        cout << Large(a,b) << endl;
    }
    return 0;
}
```

Sample Input

```
1 2
3.5 4.5
```

Sample Output

```
2
4.5
```

Result

Thus, Program " **Largest Number** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:06:01 **Register Number:** RA1911026010033

Q. Letter Pattern

Jammy is the trainer in Secondary school, he has given the task of printing the letter pattern.
Students has to create a logic which get the integer number which specify the number of rows and according to that students has to print the letter pattern
Programming language need to be used:C++
Refer Sample testcases

Source Code

```
#include <iostream>
#include<bits/stdc++.h>
using namespace std;
int main() {
 int number;
   cin >> number;
   int ascii= 'A';
   for(int i = 1; i <= number; i++){
     for(int j = 0; j < i; j++){
        if(ascii <= 90){
           cout << (char)ascii;
             ascii++;
          }else{
           ascii = 65;
    cout << (char)ascii;
             ascii++;
          }
       }
      cout << endl;
   }
 return 0;
}
```

Sample Input

7

Sample Output

```
A
BC
DEF
GHIJ
KLMNO
PQRSTU
VWXYZAB
```

Result

Thus, Program " **Letter Pattern** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:17:08 **Register Number:** RA1911026010033

Q. Light House

Light House in charge in maria beach is interested in sending the current time to his official in proper time format when he joins the duty in the morning and when he leave the duty in the night.
Can you help him to convert the input time into proper format and to display it?
Mandatory:
1.Create a class Time with data members hours,mins,secs.
2.Overload operator <
3.Overload operator >> to get the input time
Input Format :
First Line contains Time (hours mins secs)
Refer Sample test cases.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Time{
   public:
      int hours,mins,secs;
      void read();
      void operator >> (int h){
         cin >> hours >> mins >> secs;
      }
      void operator << (int h){
         cout << hours << " Hours " <<  mins << " Mins " << secs << " secs" << endl;
      }
};

int main(){
      Time clock;
      clock.operator>>(10);
      clock.operator<<(10);
   return 0;
}
```

Sample Input

20 10 12

Sample Output

20 Hours 10 Mins 12 secs

Result

Thus, Program " **Light House** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:09:12 **Register Number:** RA1911026010033

Q. Marks and Vector

You are appointed as the assistant to a teacher in a school and she is correcting the answer sheets of the students.

Your task is to calculate the marks given by the teacher and to Store the given values into a vector and find the maximum and minimum value using *min_element and *max_element.

Mandatory:-

1. Create vector using
vector myvector;

2. Find maximum and minimum value using
* min_element and *max_element.

Refer Sample testcases.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int size;
    cin >> size;
    vector<int> myvector;
    for(int i = 0; i < size; i++){
        int a;
        cin >> a;
        myvector.push_back(a);
    }
    cout << *min_element(myvector.begin(),myvector.end()) << " " << *max_element(myvector.begin(),myvector.end()) << endl;
    return 0;
}
```

Sample Input

```
5
1 6 5 5 1
```

Sample Output

```
1 6
```

Result

Thus, Program " **Marks and Vector** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:32:18 **Register Number:** RA1911026010033

Q. Minimum of given elements (Banglore)

Rahul Sharma is traveling from Bangalore to Chennai.

He has three different kind of route map to reach Chennai.

Help him to find the shortest route to reach Chennai on time.

Input:
Get the three integer or float values.

Mandatory:

1.Create a Template Class as
template

2.Create the "min" template function that accepts three arguments in n1,n2 and n3 as
void min(T n1,T n2,T n3)

3.Call the min template function from the main method to display the minimum value.

Output:

Print the minimum value.

Refer the following testcases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template <class T>
void min(T n1,T n2,T n3){
    cout << min(min(n1,n2),n3) << endl;
}

int main(){
    float a,b,c;
    cin >> a >> b >> c;
    min(a,b,c);
    return 0;
}
```

Sample Input

19 12 3

Sample Output

3

Result

Thus, Program " **Minimum of given elements (Banglore)** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:15:23 **Register Number:** RA1911026010033

Q. My Pair

Pair is used to combine together two values which may be different in type. Pair provides a way to store two heterogeneous objects as a single unit.
Create a pair of given two different type of values (int,string) and print them.
Mandatory
1. Create a pair named "mypair".
pair mypair;
2. Print the first and second value.
Refer Sample TestCases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){

    int a;
    string b;
    cin >> a >> b;
    pair<int,string> mypair(a,b);
    cout << mypair.first << " " << mypair.second << endl;
    return 0;
}
```

Sample Input

```
10
Bogar
```

Sample Output

```
10 Bogar
```

Result

Thus, Program " **My Pair** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:28:46 **Register Number:** RA1911026010033

Q. Number Exception

Maths teacher is given the task to student that. Write a program to input a number num and run a loop from 0 to num. The program should throw an exception whenever the loop counter variable is a multiple of 4, and display the number of exceptions at the end. If it is not an integer then give "Invalid input".

Input:
Enter the number of iterations : 12
Output:
Number of exceptions :3

Mandatory:

Use the keyword try, catch and throw.

Refer Testcase input and output.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    float a;
    cin >> a;
    int b = a;
    try{
        if(a){
            cout << "Number of exceptions: " <<(int)(a/4) << endl;
        }else{
            throw(a);
        }
    }catch(...){
        cout << "Invalid input\n";
    }

    return 0;
}
```

Sample Input

12

Sample Output

Number of exceptions: 3

Result

Thus, Program " **Number Exception** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:37:10	**Register Number:**
OOPS			RA1911026010033

Q. Numbers

Suresh is interested in finding the sum of N numbers but he wants to do it using the concept of virtual function.

Can you help him to do it?

Mandatory:
1. Create an Base class as "Super"

2. Declare a virtual function as public member as following:
Hint : virtual void nSum()=0;

3. Create a child class as "Sub" by inheriting "Super" class
Hint : class Sum:public Super

4. Define three data members of type integer and two functions as follows:

5. Define the first function read() in Sub class with default parameter
a. Function Name = read()
b. Return type = void()
c. Argument = Default argument
d. Usage = To input the value for finding sum of "n" numbers.

6. Define the second function nSum() in Sub class with default parameter
a. Function Name = nSum()
b. Return type = void()
c. Argument = Default argument
d. Usage = To compute the sum of "n" numbers and display the result

In main method:

1.Create pointer instance for base class: Super *s;

2. Create an instance for derived class: Sub sb;

3. Assign the address of s to pointer sb:
Hint: s=&sb;

4. Call the read() function using instance of Sub class:
Hint: sb.read();

5. Call the nSum function using instance of super class:
Hint: s->nSum();

Refer sample test cases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Super{
   public:
      virtual void nSum()=0;
};

class Sub:public Super{
   public:
      int numbers;
      void read(){
         cin >> numbers;
      }
      void nSum(){
         cout << (numbers * (numbers + 1))/2 << endl;
      }
};

int main(){
   Super *s;
   Sub sb;
   s = &sb;
   sb.read();
   s->nSum();
   return 0;
}
```

Sample Input

25

Sample Output

325

Result

Thus, Program " **Numbers** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:41:26 **Register Number:** RA1911026010033

Q. Olympic Gold for India

Ram is an athlete practicing hard for the upcoming Olympics in 1000 meter Relay.He practice only for 5 days in a week and participates in local tournaments onSaturday and Sunday. He has a pattern for evaluating his own performance.For the first two days he used to cover some distance X in 3 mins.For the next three days of the week he used to cover some distance Y in 3 min.

If the comparative result on applying the sum of distance in first 2 days and sum of distance of next 3 days comes as expected he believes he can achieve GOLD for INDIA in Olympics.

For finding that he need the total distance he covered in first 2 days and last 3 days.

Use Function Overloading to find the total Distance Covered by Ram.

Mandatory:

1.Create a class named "Olympic"

2.Create a function named "distance" under the class "Olympic" of type int with two parameter as "D1" and "D2" to get the distance covered by ram in Day 1 and Day 2.

3.Overload the "distance" function with "D3","D4" and "D5" respectively to find the distance covered by ram in Day 3,4 and 5.

Note:Name of the variables should be "D3","D4" and "D5" of type int.

4.Create the objects "ob" for the "Olympic" class.Access the function "distance" using the object name from the main class to calculate the total distance covered combining Day 1,2 and Day 3,4,5 Respectively.

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

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

class Olympic{
  public:
 int distance(int D1,int D2){
     return D1+D2;
    }
   int distance(int D3,int D4,int D5){
     return D3 + D4 + D5;
    }
};

int main() {
   Olympic ob;
   int a,b,c;
   cin >> a >> b;
   cout << ob.distance(a,b) << " meters" << endl;
   cin >> a >> b >> c;
   cout << ob.distance(a,b,c) << " meters" << endl;
 return 0;
}
```

Sample Input

```
90
63
71
34
47
```

Sample Output

```
153 meters
152 meters
```

Result

Thus, Program " **Olympic Gold for India** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:50:04 **Register Number:** RA1911026010033

Q. Online Shopping

Create a class called â€œitemâ€ representing no. of items (int), item code (int) and price (float).
Also, define the following member functions.
initialize() of type void: to initialize no. of items and read item code and price.
largest() of type float: to find and return an item with largest price.
sum() of type float: to calculate and return the sum of prices of all items;
and
displayitems() of type void: to display all items with code and price.
Input:
The no. of items must be less than or equal to 10.
The first line of the input must contain the no. of items.
The subsequent lines must contain item code and price for each item.
Output:
The output must print the largest price among all items, the total price of all items and print all items with code and price.
Refer Sample Testcases
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class item{
  public:
  int items;
  int itemCode[20];
  float price[20];
  void initialize(){
    cin >> items;
    int i;
    for(i=0;i<items;i++){
      cin >> itemCode[i] >> price[i];
    }
  }
  float largest(){
    int i,largest=price[0];
    for(i=1;i<items;i++){
      if(price[i]>largest)
        largest = price[i];
    }
    return largest;
  }
  float sum(){
    float sum=0;
    int i;
    for(i=0;i<items;i++){
      sum+=price[i];
    }
    return sum;
  }
  void displayitems(){
    cout << "Code and Price" << endl;
    int i;
    for(i=0;i<items;i++){
      cout << itemCode[i] << " and " << price[i] << endl;
    }
  }
};
int main(){
  item obj;
  obj.initialize();
  cout << "Largest Price=" << obj.largest() << endl;
  cout << "Sum of Prices=" << obj.sum() << endl;
  obj.displayitems();
  return 0;
}
```

Sample Input

```
5
101 23.60
107 45
112 67
190 93
110 456
```

Sample Output

```
Largest Price=456
Sum of Prices=684.6
Code and Price
101 and 23.6
107 and 45
112 and 67
190 and 93
110 and 456
```

Result

Thus, Program " **Online Shopping** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:18:51 **Register Number:** RA1911026010033

Q. Exceptional - Operator Checking

Madhan the Maths teacher asked his students ti do the following to check whether the given operator is valid of not using exceptional handling.
According to him the valid operators are (+ , - , / , *).
Mandatory:
1. Declare three variables in type "double" and one variable of type "char"
2. Get the input of operator (+ , - , * , /) and operands to perform operations. (Addition, Subtraction, Multiplication, Division)
3. Use switch case to perform operations.
4. If the operator is valid (+, - , / , *) then perform respective operations and if the operator is not valid then throw the exception and display the error message.
Note:
Use Exceptional Handling concepts, otherwise code will not evaluated to 100%.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){

    double a,b,c;
    char op;
    cin >> a >> op >> b;
    try{
        if(op == '+'){
            cout << a << op << b << "="<< a + b << endl;
        }else if(op == '-'){
            cout << a << op << b << "="<< a - b << endl;
        }else if(op == '*'){
            cout << a << op << b << "="<< a * b << endl;
        }else if(op =='/'){
            cout << a << op << b << "="<< a / b << endl;
        }else{
            throw(op);
        }
    }
    catch(char){
        cout << "Operation Error " << op <<  " is not a valid operator" << endl;
    }
    return 0;
}
```

Sample Input

```
25 + 23
```

Sample Output

```
25+23=48
```

Result

Thus, Program " **Exceptional - Operator Checking** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 15:53:32 **Register Number:** RA1911026010033

Q. Operator !

Your task is to overload operator ! to reverse the case of each alphabet in the string.
Mandatory:
1. Create a class name as "mystring".
2. Declare the public data member function and define the member variable.
3. Declare the function "operator!()" of void type to compare the string.
4. Use the function as "operator ==" to copy the string.
5. Create an object name as "s1" and "s2" for the "mystring" class.
6. Access the function declared using the object of "mystring" class and print the result in main method.
Refer sample testcases.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class mystring{
   public:
      string name;
      void a(){
       cin >> name;
      }
      void operator !(){
         for(int i = 0; i < name.size(); i++){
            if (islower(name[i])){
               name[i] = toupper(name[i]);
            }
            else if (isupper(name[i])){
               name[i] = tolower(name[i]);
            }
         }
      }
      void operator ==(mystring&){
         cout << name << endl;
      }
};

int main(){
   string name;
   mystring s1,s2;
  s1.a();
   !s1;
   s1 == s2;
   return 0;
}
```

Sample Input

```
QuEsTiOnPaPeR
```

Sample Output

```
qUeStIoNpApEr
```

Result

Thus, Program " **Operator !** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:50:30 **Register Number:** RA1911026010033

Q. Pamban Bridge

Central Government TollBooth is located at Pamban Bridge

A Car passing by the booth is expected to pay a toll.

The tollbooth keeps the track of the number of cars that gone by and the total amount of cash collected.

Mandatory:

1. Create a class named "tollbooth" with the following data members:

total number of cars passed
total toll collected.

2.Create a member function as follows to keep track of paying cars:

Name : payingcar()
Return type:Void
Parameters :One parameter of type double

Note:When any car passes through the tollbooth,that much toll gets added into total toll collected and total number of cars passed should be incremented by one.

3.Create another member function as follows to keep track of non paying cars:

Name : nonpayingcar()
Return type:Void
Parameters :No parameters

Note:Should increment the car total but adds nothing to cash total.

4.Create a member function as follows to display total number of cars passed and the total amount collected.

Name : display()
Return type:Void
Parameters :No parameters

Note:Should increment the car total but adds nothing to cash total.

5.Create a constructor that initialises both data members to zero.

6.Create an object named "obj" for the class TollBooth and access the member function payingcar(), nonpayingcar() and display() from the main function and print the result.

Input Format:

First line is the Number of Testcases

From the next line Number of testcase with Vehicle number and Toll amount collected for each testcase follows

Output Format:

Print the number of cars passed and total amount collected.

Programming Language need to be used:C++

Refer sample testcases.

Source Code

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

class tollbooth{
 public:
    double tollCollected;
    int carsPassed;
    tollbooth(){
         carsPassed = 0;
          tollCollected = 0;
       }
    void payingcar(double price){
          carsPassed++;
         tollCollected += price;
       }
    void nonpayingcar(){
        carsPassed++;
      }
    void display(){
        cout << "Total number of cars passed = " << carsPassed << endl;
         cout << "Total amount collected = " << tollCollected << endl;
       }
};

int main() {
 tollbooth obj;
   int t;
   string number;
   double price;
   cin >> t;

   for(int i = 0; i < t; i++){
     cin >> number >> price;
       if(price != 0){
       obj.payingcar(price);
       }else{
        obj.nonpayingcar();
       }
   }
   obj.display();
 return 0;
}
```

Sample Input

```
3
TN401 39.5
PY401 80
TN402 0
```

Sample Output

```
Total number of cars passed = 3
Total amount collected = 119.5
```

Result

Thus, Program " **Pamban Bridge** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:44:18 **Register Number:** RA1911026010033

Q. Payroll

Develop a Payroll application using Single Level Inheritance

Hint:

1. Create a class "SingleInheritance" and do the following in the data-members and method

Data members
a. name and gender of type String
b. salary and age of type integer

Method:

Method name = getDetails
Get the input from user such as; name, gender, age and salary.

2. Inherit a â€œinheritedclassâ€ class from "SingleInheritance" class
Method name = getDetails
Display the output to user such as; name, gender, age and salary.

3. Create instance for " inheritedclass " as "tc" and access the getDetails() and display() methods.

Refer Sample Testcases

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class SingleInheritance{
   public:
      string name,gender;
      int salary,age;
      void getDetails(){
         cin >> name >> gender >> age >> salary;
      }
};

class inheritedclass:public SingleInheritance{
   public:
      void display(){
         cout << "Name=" << name << endl << "Gender=" << gender << endl << "Age=" << age << endl << "Salary=" << salary << endl;
      }
};

int main(){
   inheritedclass tc;
   tc.getDetails();
   tc.display();
   return 0;
}
```

Sample Input

```
Bogar
Male
2000
12000
```

Sample Output

```
Name=Bogar
Gender=Male
Age=2000
Salary=12000
```

Result

Thus, Program " **Payroll** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:49:03 **Register Number:** RA1911026010033

Q. Payslip Generation

Vasu has a home, she needs to find the perimeter of the same.
(Hint: Class C1 gets length and breadth as input which is used by class C2 derived from C1.
C2 calculates perimeter of the house)

Refer sample Testcases:

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class C1{
   public:
      int length,breadth;
      void get(){
         cin >> length >> breadth;
      }
};

class C2:public C1{
   public:
      void perimeter(){
         cout << 2 *(length + breadth) << endl;
      }
};

int main(){
   C2 obj;
   obj.get();
   obj.perimeter();
   return 0;
}
```

Sample Input

```
10
20
```

Sample Output

```
60
```

Result

Thus, Program " **Payslip Generation** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:46:54 **Register Number:** RA1911026010033

Q. Percentage of Student

Illustration of Multiple Inheritance
Mandatory:
1. Create a base class named "AddData"
2. Create and define the member function "accept_details()" to get the marks of the student
3. Create another class named "Total" derived from "AddData" . class Total : public AddData
4. Create and define the member function named "total_of_three_subjects()" to calculate and store the total of all the subject marks.
5. Create the class named "Percentage" derived from "Total" . class Percentage : public Total
6. Create and define the member function named "calculate_percentage()" to calculate the percentage of the student.
7. Create and define the member function named "show_result()" to display the percentage of the student.
8. Declare the object for the derived class "Percentage" named "p" and call the following functions from the main method.
accept_details(),total_of_three_subjects(),calculate_percentage(),show_result()

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class AddData{
   public:
      int a,b,c;
      void accept_details(){
         cin >> a >> b >> c;
      }
};

class Total : public AddData{
   public:
      int total;
      void total_of_three_subjects(){
         total = a + b + c;
      }
};

class Percentage : public Total{
   public:
      int percentage;
      void calculate_percentage(){
         percentage = total/3;
      }
      void show_result(){
         cout << percentage << endl;
      }
};

int main(){
   Percentage p;
   p.accept_details();
   p.total_of_three_subjects();
   p.calculate_percentage();
   p.show_result();
   return 0;
}
```

Sample Input

79 81 99

Sample Output

86

Result

Thus, Program " **Percentage of Student** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:03:43 **Register Number:** RA1911026010033

Q. Play with Fraction

Your task is to perform addition of fraction(normalization is not required) by overloading the + operator.

Create a class Fraction with two variables numerator and denominator.

Input Method:

Line 1: First line consists of the first fraction with numerator and denominator separated by space.
Line 2: Second line consists of the second fraction with numerator and denominator separated by space.

Mandatory:

1. Create a class named as "Fraction".
2. Declare the public data member and define member variable.
3. Using the "operator+" of Fraction class to perform the addition of fraction.
4. Create an object named "obj" for the Fraction class.
5. Access the operator of Fraction class and print the result in main method.

Refer Sample testcases.

Programming languages need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Fraction{
   public:
      int a,b;
      Fraction(){
      a = 0;
      b = 0;
      }
      void read(){
      cin >> a >> b;
      }

      Fraction operator+(Fraction obj){
         Fraction c;
         c.a =(a * obj.b)+(b * obj.a);
         c.b = b * +obj.b;
         return c;
      }
 };

int main(){
   Fraction d,e,answer;
   d.read();
   e.read();
   answer = d + e;
   cout << answer.a << "/" << answer.b;
return 0;
}
```

Sample Input

```
6 3
8 4
```

Sample Output

```
48/12
```

Result

Thus, Program " **Play with Fraction** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:16:19 **Register Number:** RA1911026010033

Q. Play with Streams

Stringstream is a stream class to operate on strings. It basically implements input/output operations on memory (string) based streams.
Stringstream can be helpful in different type of parsing.
The following operators/functions are commonly used here
1.Operator >>
Extracts formatted data.
2.Operator <<
Inserts formatted data.
3.Method str()
Gets the contents of underlying string device object.
4.Method str(string)
Sets the contents of underlying string device object.
Mandatory:
1.You have to write the function vector parseInts(string str)
2.str will be a string consisting of comma-separated integers, and you have to return a vector of int representing the integers.
Note:Header files need to be included without any spaces.
Input Format
The first and only line consists of n integers separated by commas.
Output Format
Print the integers after parsing it.
Refer Sample test cases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    string str;
    cin >> str;
    vector<int>parseInts(string str);
    for(int i = 0; i < str.size();i++){
       if(str[i] != ','){
         cout << str[i];
        }else{
         cout << endl;
        }

    }
    return 0;
}
```

Sample Input

```
23,4,56
```

Sample Output

```
23
4
56
```

Result

Thus, Program " **Play with Streams** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:05:43 **Register Number:** RA1911026010033

Q. Play with XOR

Janani has written N binary integers (i.e. either zero or one) on a blackboard. She recently learned about XOR operation. Now she wants to erase exactly one integer in the array so that the XOR of the remaining N - 1 numbers is zero. Please help her to calculate the number of ways of doing so.

Input Format:

The first line of the input contains an integer T denoting the number of test cases. The description of T test cases follows.

The first line of each test case contains a single integer N denoting the number of numbers that Janani has written on a blackboard.

The second line contains N space-separated integers A1, A2, ..., AN denoting the numbers she had written.

Output Format:

For each test case, output a single line containing the number of ways to erase exactly one integer so that the XOR of the remaining integers is zero. The ways where you erase the same integer but on different places in the given sequence are considered different.

Constraints:

1 â%¤ T â%¤ 20
2 â%¤ N â%¤ 10 power 5
0 â%¤ A subscript i â%¤ 1

Refer Sample Test Cases

Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include<bits/stdc++.h>
using namespace std;
int main() {
 int t;
   cin >> t;
   while(t--){
     int size;
       cin >> size;
       map<int,int> data;
       for(int i = 0; i < size; i++){
         int a;
           cin >> a;
           data[a]++;
       }
       if(data[1] % 2 != 0){
         cout << data[1] << endl;
       }else{
         cout << data[0] << endl;
       }
   }
 return 0;
}
```

Sample Input

```
2
5
1 0 0 0 0
5
1 1 1 1 1
```

Sample Output

```
1
5
```

Result

Thus, Program " **Play with XOR** " has been successfully executed

Course:	Session:	Timestamp:	Register Number:
OOPS	Abstract Class Virtual Function and Friend Function	2020-10-30 15:36:00	RA1911026010033

Q. Polio

Central Medical Council has created the separate wing to educate people of the country about polio.
As per the order the group of central government employees has collected the data from the people of various states.
Now they want to present the overall picture of the survey to the central ministry.
So the are looking forward to automate the calculation of interdependency of states with respect to polio
Can you hep the officials to do that??
Mandatory:
1.Create a class "country"
2.Create a virtual function named "getdata" of type void.
3.Create a virtual function named "display" of type void.
4.Create a class "state" derived from class "country" and create the necessary member functions to get the details of state.
5.Invoke the getdata and display methods from the main method and display the result.
Refer Sample Testcases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class country{
   public:
      string country_name;
      int polio,literacy;
      virtual void getdata(){
         cin >>  country_name >> polio >> literacy;
      };
      virtual void display(){
         cout << "Country Name " << country_name << endl;
         cout << "Country Polio% " << polio << endl;
         cout << "Country Litteracy%" << literacy << endl;
         cout << "The Measure of Interdependency " << ((float)(polio)/literacy)  << endl;
      };
};

class state:public country{
   public:
      void getdata(){
         cin >> country_name >> polio >> literacy;
      }
      void display(){
         cout << "State Name " << country_name << endl;
         cout << "%Age of Polio of State " << polio << endl;
         cout << "%Age of Literacy of State " << literacy << endl;
         cout << "The Measure of Interdependency " << ((float)(polio)/literacy) << endl;
      }

};

int main(){
   country obj;
   obj.getdata();
   obj.display();
   state objj;
   objj.getdata();
   objj.display();
   return 0;
}
```

Sample Input

```
India
85
50
Tamilnadu
46
23
```

Sample Output

```
Country Name India
Country Polio% 85
Country Litteracy%50
The Measure of Interdependency 1.7
State Name Tamilnadu
%Age of Polio of State 46
%Age of Literacy of State 23
The Measure of Interdependency 2
```

Result

Thus, Program " **Polio** " has been successfully executed

Course: OOPS **Session:** Operator Overloading **Timestamp:** 2020-10-30 16:17:31 **Register Number:** RA1911026010033

Q. Prefix Increment

Your task is to Implement Prefix Increment operator using ++ Operator Overloading
Mandatory:
1. Create the class name as "increment".
2. Declare public data member and define the variable of type double.
3. Using the function getx() to get the input values.
4. Define the function named as "increment::operator ++()" of void type to increment the values of input.
5. Create an object named "obj" for the increment class.
6. Access the function getx() using the object of increment class and print the result in main method.
Refer Sample Test Cases
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class increment{
   public:
      double a,c;
      double b;
      void getx(){
         cin >> a >> b >> c;
      }
      void operator ++();
};

void increment::operator ++(){
   a++,b++,c++;
  cout << a << " " << b << " " << c << endl;
}

int main(){
   increment obj;
   obj.getx();
   obj.operator++();

   return 0;
}
```

Sample Input

10 5.5 18

Sample Output

11 6.5 19

Result

Thus, Program " **Prefix Increment** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:06:18 **Register Number:** RA1911026010033

Q. Print Floyd's

Create a logic to print Floyd's triangle upto the given n rows.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
 int number;
   cin >> number;
   int count = 1;
   for(int i = 1; i <= number; i++){
     for(int j = 0; j < i; j++){
        cout << count;
          count++;
       }
      cout << endl;
    }
 return 0;
}
```

Sample Input

5

Sample Output

1
23
456
78910
1112131415

Result

Thus, Program " **Print Floyd's** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:30:03 **Register Number:** RA1911026010033

Q. Product of numbers

Person X has bought n number of basket ball for his college team. If One ball costs x Rs, find the total cost of the basket balls.

Input:
Get the 2 integer or float values in the input.
First Number Indicates number of balls
Second Number Indicates Cost of one ball

Mandatory:

1.Create a Template Class as
template
2.Create the "displayresult" template function to display the task output.

3.Collect the data from different data types and multiple the data with the cost of product.

4.Use the "displayresult" function to display the output in the main function.

Output:
Print Number of balls in first line
Print Cost of one ball in second line
Print the total cost in third line

Refer the following testcases.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>
T displayresult(T a , T b){
    T c = a * b;
    return c;
}

int main(){
    float a,b;
    cin >> a >> b;
    cout << a << endl;
    cout << b << endl;
    cout << displayresult(a,b) << endl;
    return 0;
}
```

Sample Input

```
50 400.75
```

Sample Output

```
50
400.75
20037.5
```

Result

Thus, Program " **Product of numbers** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:06:34 **Register Number:** RA1911026010033

Q. Professor Omkar

Omkar is the Professor in SRM he has decided to give a simple task to his students.
He asked his students to create a logic for automatically calculating the amount of energy needed to head X amount of water from Y initial temperature to Z final temperature.
The formula to compute the energy is as follows
Q = M * (finalTemperature â€“ initialTemperature) * 4184
Where,
M is the weight of water in kilograms,
Q is the energy measured in joules,
and
Temperatures are in degree Celsius.
Input Format:
Get the input of amount of water in kilograms , initial temperature of water and final temperature of the water.
Output Format:
Print the energy needed to heat the water.
Refer Sample Testcases
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
 float m,finalTemp,initialTemp;
   cin >> m >> initialTemp >> finalTemp;
     float q =m * (finalTemp - initialTemp) * 4184;
   cout<< "The energy needed is " << q;
 return 0;
}
```

Sample Input

567 12 56

Sample Output

The energy needed is 1.04382e+08

Result

Thus, Program " **Professor Omkar** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:49:35 **Register Number:** RA1911026010033

Q. RBI

RBI asked the Banks to move towards Core Banking where all the activities of the customers were reflected in all the branches in India.
But some of the banks are finding the transformation tough.
Can you help them to automate the bank process as per their requirements.
Mandatory:
1 . Create a class named "Bank" with the following data members to represent bank account
"name" of type "string"
"accounttype" of type "string"
"acc" of type "int"
"balance" of type "int"
2. Create a member function named "initial" of type "void" to get the initial details of the account such as name,account number,account type and balance.
3.Create a member function named "deposit" of type "void" to deal with the deposits in the account
4. Create a member function named "withdraw" of type "void" and do the following
If the requested amount is less than available balance print "Insufficient amount" else the deduce the amount from the account and print the balance.
5. Create a member function named "disp" of type "void" to display name,account number,account type and account balance.
6.Access the member functions "initial","deposit","withdraw","disp" using the object named "obj" in the main method.

Source Code

```
#include<bits/stdc++.h>
using namespace std;
class Bank{
  private:
  string name;
  string accounttype;
  int acc;
  double balance;
  public:
  void initial(){
    cin>>name>>acc>>accounttype>>balance;
  }
  void deposit(){
    float deposit;
   cin>>deposit;
   balance+=deposit;
  }
  void withdraw() {
    float withdraw;
    cin>>withdraw;
    if(withdraw>balance){
      cout<<"Insufficient amount\n";
    }
    else balance-=withdraw;
  }
  void disp() {
    cout<<"NAME="<<name<<"\nACCNO="<<acc<<"\nTYPE="<<accounttype<<"\nBALANCEAMOUNT="<<balance<<endl;
  }
};

int main(){
  float deposit,withdraw;
  Bank obj;
  obj.initial();
  obj.deposit();
  obj.withdraw();
  obj.disp();
  return 0;
}
```

Sample Input

```
Jack 435 SB 500
1500
200
```

Sample Output

```
NAME=Jack
ACCNO=435
TYPE=SB
BALANCEAMOUNT=1800
```

Result

Thus, Program " **RBI** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:44:49 **Register Number:** RA1911026010033

Q. Rectangle

Mandatory:
1. Create two public classes named "Area" and "Perimeter"
2. Create a member function named "getArea" of type int with two parameters length and berth
3.Create a member function named "getPerimeter" of type int with two parameters length and berth
4.Create a class named "Rectangle" and inherit the Area and Perimeter class.
5.Pass the length and breath values of the rectangle as the parameters to getArea and getPerimeter functions of the Area and Perimeter classes respectively and calculate the area and perimeter of the rectangle.
6.Create an object named "rt" for rectangle class and access the area and perimeter class from main method to print the result.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Area{
   public:
      int getArea( int length,int berth){
         return length * berth;
      }
};

class Perimeter{
   public:
      int getPerimeter(int length,int berth){
         return (2 *(length + berth));
      }
};

class Rectangle:public Area,public Perimeter{
   public:
};

int main(){
   Rectangle rt;
   int a,b;
   cin >> a >> b;
   cout << rt.getArea(a,b) << endl;
   cout << rt.getPerimeter(a,b) << endl;
   return 0;
}
```

Sample Input

```
5 4
```

Sample Output

```
20
18
```

Result

Thus, Program " **Rectangle** " has been successfully executed

Course: OOPS **Session:** Exceptional Handling **Timestamp:** 2020-10-30 15:25:03 **Register Number:** RA1911026010033

Q. Relational Operators - Exceptional Handling

Bogar, the Tamil (Mother of all languages) Siddhar was given a task for checking the OPERATORS in C++. Agathiyar, another siddhar was given the opportunity to select the OPERATOR to be assigned for Bogar. Agathiyar after consulting with 16 Siddhars in Lemuria Continent called as "Kumari Kandam" and decided to assign "RELATIONAL OPERATORS" to Bogar. Now Bogar wants to check the Relational Operators and its functionality.
Bogar was asked to implement the concept using Exceptional Handling (try, catch and throw)

Note:For catch block,the argument name should be msg .

Refer Sample Input and Output.Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main()
{
  int a,b;
  cin>>a>>b;
  try
  {
    if(a>0 && b>0)
    {
      if(a>b)
      {
        cout<<a<<"<"<<b<<"=0"<<endl;
        cout<<a<<"<="<<b<<"=0"<<endl;
        cout<<a<<"="<<b<<"=0"<<endl;
        cout<<a<<">"<<b<<"=1"<<endl;
        cout<<a<<">="<<b<<"=1"<<endl;
        cout<<a<<"!="<<b<<"=1"<<endl;
      }
      else if(a<b)
      {
        cout<<a<<"<"<<b<<"=1"<<endl;
        cout<<a<<"<="<<b<<"=1"<<endl;
        cout<<a<<"="<<b<<"=0"<<endl;
        cout<<a<<">"<<b<<"=0"<<endl;
        cout<<a<<">="<<b<<"=0"<<endl;
        cout<<a<<"!="<<b<<"=1"<<endl;
      }
      else
      {
        cout<<a<<"<"<<b<<"=0"<<endl;
        cout<<a<<"<="<<b<<"=1"<<endl;
        cout<<a<<"="<<b<<"=1"<<endl;
        cout<<a<<">"<<b<<"=0"<<endl;
        cout<<a<<">="<<b<<"=1"<<endl;
        cout<<a<<"!="<<b<<"=0"<<endl;
      }
    }
    else
      throw a;
  }
  catch(...)
  {
    cout<<"No Negative Numbers";
  }
  return 0;
}
```

Sample Input

25 -2

Sample Output

No Negative Numbers

Result

Thus, Program " **Relational Operators - Exceptional Handling** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:22:31 **Register Number:** RA1911026010033

Q. Saravana Stores

Saravana Stores in Chennai has decided to give increment in wages of its employees.And they wants the automated software which does the job of calculating the revised wages for them based on the increment amount given by the cashier.

You should use function overloading concept to do it.

Mandatory:

1.Create a class named "Salary"

2.Create a function named "Increment" under the class "Salary" of type int with one parameter as "currsal" to gets current wages of the employee.

3.Overload the "Increment" function with "currsal" and "bonus" respectively and calculate the revised salary of the employee

Note:Name of the variables should be "currsal" and "bonus" of type int.

3.Create the objects "ob" for the "Salary" class.Access the function "Increment" using the object name from the main class to calculate the revised salary of employees.

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;


class Salary{
    public:
        int Increment(int currsal){
            return currsal ;
        }
        int Increment(int currsal,int bonus){
            return currsal + bonus ;
        }
};

int main(){
    Salary ob;
    int a,b;
    cin >> a >> b;
    cout <<ob.Increment(a) << endl;
    cout <<ob.Increment(a,b)<< endl;
    return 0;
}
```

Sample Input

```
1000
251
```

Sample Output

```
1000
1251
```

Result

Thus, Program " **Saravana Stores** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:03:51 **Register Number:** RA1911026010033

Q. Scientist Game

Armstrong was one of the great scientist.
The Indian council decided that we need to assign some number as a gift to the great scientist.
There was a suggestion given by the Indian Council. If the sum of cube of each number is again equal to the number then they decided that they can assign the number to the great scientist.
Kindly help the Indian Council to complete the task by writing a simple logic.
Refer sample Inputs and Outputs.
Input 1: 153
Output: Give to Scientist Armstrong
Reason((1*1*1 + 5*5*5 3*3*3=153) which is equal to the number)
Input 2: 134
Output: Don't Give to Scientist Armstrong
Reason((1*1*1 + 5*5*5 2*2*2=134) which is not equal to the number)
NOTE:
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include<bits/stdc++.h>
using namespace std;
int main() {
 int number;
   cin >> number;
   int sum = 0,answer = number;
   while(number != 0){
       int a = number % 10;
     sum += pow(a,3);
       number /= 10;
    }
   if(sum == answer){
     cout << "Give to Scientist Armstrong\n";
    }else{
     cout << "Dont Give to Scientist Armstrong\n";
    }
 return 0;
}
```

Sample Input

371

Sample Output

Give to Scientist Armstrong

Result

Thus, Program " **Scientist Game** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:15:43 **Register Number:** RA1911026010033

Q. Sets

Sets are containers that store unique elements following a specific order.

HINT:

Here are some of the frequently used member functions of sets:

sets; //Creates a set of integers.

int length=s.size(); //Gives the size of the set.

s.insert(x); //Inserts an integer x into the set s.

s.erase(val); //Erases an integer val from the set s.

Coming to the problem, you will be given Q queries. Each query is of one of the following three types:

1 x: Add an element x to the set.
2 x: Delete an element x from the set. (If the number x is not present in the set, then do nothing).
3 x: If the number x is present in the set, then print "Yes"(without quotes) else print "No"(without quotes).

Input Format

The first line of the input contains Q where Q is the number of queries.
The next Q lines contain 1 query each.
Each query consists of two integers y and x where y is the type of the query and x is an integer.

Constraints

1<=Q<= 10 power 5
1<=y<= 3
1<=x<= 10 power 9

Output Format

For queries of type 3 print "Yes"(without quotes) if the number x is present in the set and if the number is not present, then print "No"(without quotes).

Each query of type 3 should be printed in a new line.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    set<int>s;
    int size;
    cin >> size;
    while(size--){
        int y,x;
        cin >> y >> x;;
        if(y == 1){
            s.insert(x);
        }else if(y == 2){
            s.erase(x);
        }else{
            if(s.find(x) != s.end()){
                cout << "Yes\n";
            }else{
                cout << "No\n";
            }
        }
    }
    return 0;
}
```

Sample Input

```
8
1 9
1 6
1 10
1 4
3 6
3 14
2 6
3 6
```

Sample Output

```
Yes
No
No
```

Result

Thus, Program " **Sets** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:34:29	**Register Number:**
OOPS			RA1911026010033

Q. Shape and Measurements

Adarsh the Civil engineering student is interested in finding the perimeter of the rectangle.But he has only length and breadth of the rectangle and dont know hot to calculate the perimeter of the rectangle.
Can you help him ?
Mandatory:
1.Create a class named "Shape"
2.Create a virtual function named "getPerimeter" of type int.
virtual int getPerimeter() = 0;
3.Create a class Rectangle derived from class "Shape"
4.Invoke the virtual function getPerimeter from the rectangle class to calculate the perimeter of rectangle.
5.Display the result in the main method.
Refer sample testcases.
Programming language need to be used is :C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Shape{
   public:
      virtual int getPerimeter()=0;
};

class Rectangle:public Shape{
   public:
      int l,b;
      int getPerimeter(){
         cin >> l >> b;
         return 2 * (l + b) ;
      }
};

int main(){
   Rectangle obj;
   cout << "Perimeter of Rectangle is: "<< obj.getPerimeter() << endl;
   return 0;
}
```

Sample Input

```
5
8
```

Sample Output

```
Perimeter of Rectangle is: 26
```

Result

Thus, Program " **Shape and Measurements** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:49:26 **Register Number:** RA1911026010033

Q. Single Level Inheritance - Rectangle

There was one fine morning Rina, Meena, Sona are playing a game.
They set a rule for that game is Rina and Meena should tell one number for each and the task for Sona is to find the sum and multiplication of Rina and Meena.
Class "A", "B", "C" are the three different classes and C is derived from both A and B.
Calss A has member function "getxval" and Class B has the member function "getyval" similarlly C class has the memberfunction "sum" and "mul".
Object name for the class C should be "obj"

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class A{
   public:
      int x;
      void getxval(){
         cin >> x;
      }
};

class B{
   public:
      int y;
      void getyval(){
         cin >> y;
      }
};

class C:public A,public B{
   public:
      void sum(){
         cout << "Sum = " << x + y << endl;
      }
      void mul(){
         cout << "Product=" << x * y << endl;
      }
};

int main(){
   C obj;
   obj.getxval();
   obj.getyval();
   obj.sum();
   obj.mul();
   return 0;
}
```

Sample Input

```
150 5
```

Sample Output

```
Sum = 155
Product=750
```

Result

Thus, Program " **Single Level Inheritance - Rectangle** " has been successfully executed

Course: OOPS **Session:** Function and Constructor Overloading **Timestamp:** 2020-10-30 16:21:51 **Register Number:** RA1911026010033

Q. Smart Appraisal System

Harsh HR of a Google HQ in Bangalore is looking for the automated appraisal management system.
The current salary of the employee is fixed and based on the results of the performance monitoring software the appraisal management system have to revise the salary of the employee.
Use the Contructor Overloading Concept to develop automated appraisal management system.
The Default Salary of employees is 30000.
sal=30000
Mandatory:
1.Create a new class named "Appraisal"
2.Create a constructor for the class "Appraisal"
3.Create a variable name "sal" to get the default salary and also get the new salary of the employee.
4.Create a object named "myobj" and "myobj2" for the class "Appraisal" in the main class.
5.Access the "Appraisal" class from the main class to print the current salary and the revised salary of the employee.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class TestClass
{
  public:
class Appraisal
{
  int sal;
  public:
  void in()
  {
    cin>>sal;
  }
  void out()
  {
    cout<<"\nNew Salary:"<<sal;
  }
  Appraisal()
  {
    sal=30000;
    cout<<"Old Salary:"<<sal;

  }
};
};
int main() {

 TestClass::Appraisal myobj;
  TestClass::Appraisal myobj2();
  myobj.in();
  myobj.out();
 return 0;
}
```

Sample Input

33000

Sample Output

Old Salary:30000
New Salary:33000

Result

Thus, Program " **Smart Appraisal System** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:16:02 **Register Number:** RA1911026010033

Q. Sort Game

You are given N integers.Sort the N integers and print the sorted order.
Store the N integers in a vector.
Vectors are sequence containers representing arrays that can change in size.
Declaration:
vectorv; (creates an empty vector of integers)
Size:
int size=v.size();
Pushing an integer into a vector:
v.push_back(x); (where x is an integer.The size increases by 1 after this.)
Popping the last element from the vector:
v.pop_back(); (After this the size decreases by 1)
Sorting a vector:
sort(v.begin(),v.end()); (Will sort all the elements in the vector)
Input Format
The first line of the input contains N where N is the number of integers.
The next line contains N integers .
Constraints
1 <=N<= 10 power 5
1 <=Vi<= 10 power 9
where Vi is the ith integer in the vector.
Output Format
Print the integers in the sorted order one by one in a single line followed by a space.

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

int main(){
    int size;
    cin >> size;
    vector<int>v;
    for(int i = 0; i < size; i++){
        int a;
        cin >> a;
        v.push_back(a);
    }
    sort(v.begin(),v.end());
    for(int i = 0; i < size; i++){
        cout << v[i] << " ";
    }
    cout << endl;
    return 0;
}
```

Sample Input

```
5
1 6 10 8 4
```

Sample Output

```
1 4 6 8 10
```

Result

Thus, Program " **Sort Game** " has been successfully executed

Course: OOPS | **Session:** Function and Constructor Overloading | **Timestamp:** 2020-10-30 16:46:49 | **Register Number:** RA1911026010033

Q. SRM Admission

Admission for the current Academic year is happening in SRM University.Once the Students got admitted they are assigned a unique Registration Number.
Admission in charges used to assign give these details in some order.But during enrollment of the student there is a specific order need to be followed.
So your task is to get the name and registration number of the student from admission in charge and to convert it to the correct format.
You should use function overloading concept to do it.
Mandatory:
1.Create a class named "Student"
2.Create a function named "Identity" under the class "student"of type void with two parameters "name" and "id".The function "identity" should accept the name and id values in any order and converter it to correct order.
Note:Name of the variables should be "name" and "id" and the dimension of character array should be 100.
3.Create the objects "s1" for the "Student" class.Access the function using the object name from the main class to print the student details in correct order.
Refer Sample Test Cases.
Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Student{
  public:
    void identity(char name[100],int id){
        cout<<name<<" "<<id<<"\n";
    }
    void identity(int id,char name[100]){
        cout<<name<<" "<<id;
    }
};
int main()
{
    int  id;
    char name[100];

    cin >>name>>id;
    Student s1;
     s1.identity(name,id);
   cin>>id>>name;
    s1.identity(id,name);


    return 0;
}
```

Sample Input

```
Harsh
1930405078
1930405079
Amit
```

Sample Output

```
Harsh 1930405078
Amit 1930405079
```

Result

Thus, Program " **SRM Admission** " has been successfully executed

Course: OOPS | **Session:** Function and Constructor Overloading | **Timestamp:** 2020-10-30 16:18:40 | **Register Number:** RA1911026010033

Q. Store Keeper

Store Keeper of Super market is finding it difficult to keep track of the stocks in the shop.
So he wants a automated script which pick the total nuber of consumed items from each category and calculate the remaining stock and print those details so that store keeper can order for those items.
You should use function overloading concept to do it.
Mandatory:
1.Create a class named "Store"
2.Create a function named "itemcount" under the class "Store" of type int with one parameter as "id"to get the id of the item.
3.Overload the "itemcount" function with "totalavl" and "consumed" respectively to get the total purchased item count and total number of items sold.
Note:Name of the variables should be "totalavl" and "consumed"
3.Create the objects "ob" for the "Store" class.Access the method "itemcount" using the object name from the main class to display the remaining count of items in the store.
Refer Sample Test Cases.
Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class Store{
  public:
 int itemcount(int id){
     return id;
    }
  int itemcount(int totalavl,int consumed){
   return totalavl - consumed;
  }
};


int main(){
    Store ob;
    int a,b,c;
    cin >> a >> b >> c;
    cout << ob.itemcount(a)   << endl;
    cout << ob.itemcount(b,c) << endl;
    return 0;
}
```

Sample Input

```
2021
125
67
```

Sample Output

```
2021
58
```

Result

Thus, Program " **Store Keeper** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:53:04 **Register Number:** RA1911026010033

Q. Student Details

Design a class student representing roll no, name, height, weight.

Include a default constructor to assign values to the above members, a read() member function to get values to the above members and a display() member function to display the same.

Create two objects s1 ans s2. Call the member function read() only with s1 and display() with s1 and s2.

Default Values are as follows:

name=Nikhil
rollno=20;
height=165.5;
weight=58.2;

Source Code

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

class student{
  public:
 int roll;
   string name;
   double height,weight;
   student(){
     name="Nikhil";
       roll=20;
       height=165.5;
       weight=58.2;
    }
   void read(){
     cin >> name >> roll >> height >> weight;
    }
   void display(){
     cout << name << " " << roll << " " << height << " " << weight << endl;
    }
};

int main() {
   student s1,s2;
   s1.read();
   s1.display();
   s2.display();
 return 0;
}
```

Sample Input

Richard 95 168.5 65.3

Sample Output

Richard 95 168.5 65.3
Nikhil 20 165.5 58.2

Result

Thus, Program " **Student Details** " has been successfully executed

Course: OOPS **Session:** Classes Functions and Constructors **Timestamp:** 2020-10-30 16:53:04 **Register Number:** RA1911026010033

Q. Student Details

Design a class student representing roll no, name, height, weight.

Include a default constructor to assign values to the above members, a read() member function to get values to the above members and a display() member function to display the same.

Create two objects s1 ans s2. Call the member function read() only with s1 and display() with s1 and s2.

Default Values are as follows:

name=Nikhil
rollno=20;
height=165.5;
weight=58.2;

Source Code

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

class student{
  public:
 int roll;
   string name;
   double height,weight;
   student(){
     name="Nikhil";
       roll=20;
       height=165.5;
       weight=58.2;
    }
   void read(){
     cin >> name >> roll >> height >> weight;
    }
   void display(){
     cout << name << " " << roll << " " << height << " " << weight << endl;
    }
};

int main() {
   student s1,s2;
   s1.read();
   s1.display();
   s2.display();
 return 0;
}
```

Sample Input

Richard 95 168.5 65.3

Sample Output

Richard 95 168.5 65.3
Nikhil 20 165.5 58.2

Result

Thus, Program " **Student Details** " has been successfully executed

Course: OOPS **Session:** Inheritance **Timestamp:** 2020-10-30 15:48:20 **Register Number:** RA1911026010033

Q. Student and Sports

Mandatory:
1. Create a base class named "student"
2. Create and define the member function "get()" to get the student details such as roll no,mark 1 and mark 2
3. Create another class named "sports".
4. Create and define the member function named getsm() to read the sports mark.
5. Create the class named "statement" derived from "student" and "sports".
6. Create and define the member function named "display()" to find out the total and average.
7. Declare the derived class object named "obj" and call the functions get(),getsm() and display() from the main method to print the result.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class student{
   public:
      int rollNo,mark1,marks2;
      void get(){
         cin >> rollNo >> mark1 >> marks2;
      }
};

class sports{
   public:
      int sportMark;
      void getsm(){
         cin >> sportMark;
      }

};

class statement:public student,public sports{
   public:
      void display(){
         cout << rollNo << endl;
         int total = sportMark + mark1 + marks2;
         cout << total << endl;
         cout << total/3 << endl;
      }

};

int main(){
   statement obj;
   obj.get();
   obj.getsm();
   obj.display();
   return 0;
}
```

Sample Input

```
100
90
80
90
```

Sample Output

```
100
260
86
```

Result

Thus, Program " **Student and Sports** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:32:41 **Register Number:** RA1911026010033

Q. Subtraction

Person X had purchased groceries from the shop.
He paid x Rs and need to get back the remaining.
Help him to calculate the remaining if he purchased for y Rs.

Input:
Get the 2 integer values in the input.

Mandatory:

1.Create a Template Class as
template

2.Create a "displayresult" template function to find the remaining amount need to be paid and to display it.

3.Call the displayresult function from the main method to display the remaining amount needs to be paid.

Output format;
First line: Cost of Items purchased

Second line:Total amount paid

Third line:Amount have to be paid

Refer the following testcases.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>
T displayresult(T a , T b){
    return a - b;
}

int main(){
    float a,b;
    cin >> a >> b;
    cout << a << endl;
    cout << b << endl;
    cout << displayresult(a,b) << endl;
    return 0;
}
```

Sample Input

```
450 76
```

Sample Output

```
450
76
374
```

Result

Thus, Program " **Subtraction** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:31:55 **Register Number:** RA1911026010033

Q. Sum of Numbers

We have the plan to purchase n number of items from the super market.

Also have the list and have the amount to the products.We got a little confusion to find the total amount to be paid.

Input:

Get the 4 different data values from the user end.

Mandatory:
1.Create a Template Class as
template

2. Create the "sum" template function for the addition of data.

3. Call the sum template function in the main method and print the values.

Output format:

Sum=a+b
Sum=c+d
Sum=a+c

Refer Sample testcases.

Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template <class T>
T sum(T a,T b){
    return (a + b);
}

int main(){
    float a,b,c,d;
    cin >> a >> b >> c >> d;
    cout << sum(a,b) << endl;
    cout << sum(c,d) << endl;
    cout << sum(a,c) << endl;
    return 0;
}
```

Sample Input

10 20 12 25.5

Sample Output

30
37.5
22

Result

Thus, Program " **Sum of Numbers** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:36:51	**Register Number:**
OOPS			RA1911026010033

Q. Super Market

Mohan the owner of new super market is looking for the automated software for calculating the total price of the items purchased by the customer.

Mandatory:

1.Create a class named "consumer"

2.Create a class named "transaction" derived from the consumer class.

3.Both the classes should have the overridden member functions getdata() and display() to get the items and to display the total price of the items respectively.

4.The functions in the base class should be VIRTUAL .

You should used the virtual function concept in order to get evaluated to 100%

Refer Sample testcases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class consumer{
   public:
   string name;
   virtual void getdata(){
      cin >> name;
   }
   virtual void display(){
      cout << "Name : "<<  name << endl;
   }
};

class transaction:public consumer{
   public:
      int code,quantity,price;
      string phone;
      void getdata(){
         cin >> code >> phone >> quantity >> price;
      }
      void display(){
         cout << "Code : " << code << endl;
         cout << "Telephone : " << phone << endl;
         cout << "Quantity : " << quantity << endl;
         cout << "Price : " << price << endl;
         cout << "Total Price : " << price * quantity << endl;
      }
};

int main(){
   consumer one;
   one.getdata();
   one.display();
   transaction i;
   i.getdata();
   i.display();
   return 0;
}
```

Sample Input

```
Janani
5
8374928450
5
299
```

Sample Output

```
Name : Janani
Code : 5
Telephone : 8374928450
Quantity : 5
Price : 299
Total Price : 1495
```

Result

Thus, Program " **Super Market** " has been successfully executed

Course: OOPS **Session:** Templates **Timestamp:** 2020-10-30 15:30:49 **Register Number:** RA1911026010033

Q. Swap

Students are saying some random names they like.
They need to swap the values.
But they dont know how to swap the huge amount of random names in the school.
Help them to complete the task using template concept.
Input:
Get the different data values in the input.
Mandatory:
1. Create a function template "template"
2. Declare a template Function as "Swap" that takes two arguments
void Swap(T &x,T &y)
3. Inside the function template swap the two names.
4. Invoke the template function from the main function to print the result after swapping.
Output Format:
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

template<class T>

void Swap(T &x,T &y){
    T z = x;
    x = y ;
    y = z;
}

int main(){
    string a,b;
    cin >> a >> b;
    swap(a,b);
    cout << a << " " << b << endl;
    return 0;
}
```

Sample Input

sachin dhoni

Sample Output

dhoni sachin

Result

Thus, Program " **Swap** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:17:46 **Register Number:** RA1911026010033

Q. Swapping two Functions

Vidhya the professor of SRM University has planned to conduct a surprise test for her students.The task assigned to the students is to create a swap function which swap two stacks and print the final result.
She has imposed some of the restrictions in completing the task as follows.
Mandatory:
1. Should use "stack" library and "push" , "pop" functions of Standard template Library.
2. Create 2 vectors named "i" and "j" to complete the task
3. Use reverse function of STL library
Refer Sample testcases.
Programming Language need to be used:C++

Source Code

```
#include <bits/stdc++.h>
#include <stack>
#include<vector>
using namespace std;

int main(){
    stack<int> first,second;
    vector<int>i;
   vector<int>j;
    int number;
    cin>>number;
    for(int k = 0; k < number; k++){
        int a;
        cin >> a;
        first.push(a);
    }
    for(int k = 0; k < number; k++){
        int a;
        cin >> a;
        second.push(a);
    }while (!second.empty()) {
        cout<<second.top()<<" ";
        second.pop();
    }

    reverse(i.begin(),i.end());
    reverse(j.begin(),j.end());
    cout << endl;
    while(!first.empty()){
        cout<<first.top()<<" ";
        first.pop();
    }
    return 0;
}
```

Sample Input

```
4
1 2 3 4
5 6 7 8
```

Sample Output

```
8 7 6 5
4 3 2 1
```

Result

Thus, Program " **Swapping two Functions** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:04:36 **Register Number:** RA1911026010033

Q. Swim

Gowtham is planning to go for swimming classes. He would prefer to enroll in the center which has the swimming pool of a greater area.
In the first centre that he visit, the swimming pool is a circular shape(radius-r).
In the next centre that he visit, the swimming pool is of a square shape (side-S).
Create a logic that will help him to make the choice of the swimming pool.
Input :
Input consists of 2 integers.
The first integer correspond to the radius (r) of the circular swimming pool.
The second integer corresponds to the side (S) of the square swimming pool.
NOTE:
The Programming Language need to be used is : C++
Refer sample test cases.

Source Code

```
#include <iostream>
using namespace std;
int main() {
 int radius,size;
   cin >> radius >> size;
   float Carea = 3.14 * radius * radius;
   float Sarea = size * size;
   if(Carea > Sarea){
     cout << "I prefer centre 1" << endl;
    }else{
     cout << "I prefer centre 2" << endl;
    }

 return 0;
}
```

Sample Input

```
6
4
```

Sample Output

```
I prefer centre 1
```

Result

Thus, Program " **Swim** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:04:18 **Register Number:** RA1911026010033

Q. Upper case conversion

Kamal is struggling to convert the characters of given string to upper case.
Help Kamal to convert the given string to upper case.Refer the following sample test cases.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
 string str;
   cin >> str;
   for(int i = 0; i < str.size(); i++){
      putchar(toupper(str[i]));
    }
 return 0;
}
```

Sample Input

abcde

Sample Output

ABCDE

Result

Thus, Program " **Upper case conversion** " has been successfully executed

Course:	**Session:** Abstract Class Virtual Function and Friend Function	**Timestamp:** 2020-10-30 15:36:20	**Register Number:**
OOPS			RA1911026010033

Q. Varun and his Students

Varun the maths teacher assigned his students the task of finding the average of numbers but he imposed some of the constraints in doing that.

Can you help the students to complete their task??

Mandatory:
1. Create an Abstract class as "parent"

2. Declare a virtual function as public member as following:
Hint : virtual float average(int a, int b, int c)=0;

3. Create a child class as "derived" by inheriting "parent" class
Hint : class child:public parent

4. Define the average() function in Derived class with two parameter
a. Function Name = average()
b. Return type = float()
c. Argument = Three argument of type integer
d. Usage = To add three values, find the average and return the value to main function.

In main method:

1.Create pointer instance for base class: parent *p;

2. Create an instance for derived class: child c;

3. Assign the address of d to pointer b:
Hint: p=&c;

4. Declare three variable and read it:
Hint: int a,b,c; cin>>a>>b>d;

5. Call the sum function using:
Hint: p->average(a,b,cd) and print the result.

Refer Sample test cases.

Programming language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
using namespace std;

class parent{
   public:
      virtual float average(int a,int b,int c)= 0;
};

class child:public parent{
   public:
      float average(int a,int b,int c){
         int total = a + b + c;
         return (float)total/3;
      }
};

int main(){
   parent *p;
   child c;
   p = &c;
   int a,b,d;
   cin >> a >> b >> d;
   cout << "Average=" << p->average(a,b,d);
   return 0;
}
```

Sample Input

3 4 6

Sample Output

Average=4.33333

Result

Thus, Program " **Varun and his Students** " has been successfully executed

Course: OOPS **Session:** STL **Timestamp:** 2020-10-30 15:17:07 **Register Number:** RA1911026010033

Q. Vector Iterator

Your task is to Create a vector and to add the given values to it.
Then you need to print the vector values in given order and reverse order using iterator and reverse iterator.
Mandatory:
1. Create a vector named "MyVector".
2. Create a iterator and reverse iterator.
3. Add the values into vector using push_back() function.
4. Use iterator and reverse_iterator to traverse and print the values
Refer Sample Test cases.
Programming Language need to be used:C++

Source Code

```
#include<bits/stdc++.h>
#include<iostream>
#include<vector>
using namespace std;
int main(){
    int size;
    cin >> size;
    vector<int>MyVector;
    for(int i = 0; i < size; i++){
        int a;
        cin >> a;
        MyVector.push_back(a);
        cout << a << " ";
    }
    cout << endl;
   vector<int>::iterator itr = MyVector.begin();
    for(vector<int>::reverse_iterator it = MyVector.rbegin();it!= MyVector.rend();it++){
        cout << *it << " ";
    }
    cout << endl;
    return 0;
}
```

Sample Input

```
3
17 56 34
```

Sample Output

```
17 56 34
34 56 17
```

Result

Thus, Program " **Vector Iterator** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:04:47 **Register Number:** RA1911026010033

Q. Waiting or Not Waiting

Raju's maths teacher gave him a task of identifying the number name.
If the number is greater than 0 then he should utter to the teacher as "I am waiting".
If the number is less than 0 then he should utter the word as "I am not waiting".
If the number is "0" the he should utter the word as "Sorry" Help him by completing his task.
Refer Sample Test Cases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
   int number;
   cin >> number;
   if(number > 0){
     cout << "I am waiting" << endl;
    }else if(number == 0){
     cout << "Sorry" << endl;
    }else{
     cout << "I am not waiting" << endl;
    }
 return 0;
}
```

Sample Input

15

Sample Output

I am waiting

Result

Thus, Program " **Waiting or Not Waiting** " has been successfully executed

Course: OOPS **Session:** I/O Operations **Timestamp:** 2020-10-30 17:05:09 **Register Number:** RA1911026010033

Q. You and Me

In Argentina the COUPLE GAMESHOW named You and Me is going to happen.
In order to complete the application process for the game show the participants need to find their average age.
Can you help them them to find their average age?
NOTE:
The Programming Language need to be used is : C++
Refer sample input and output in the test cases.

Source Code

```
#include <iostream>
using namespace std;
int main() {
 int num1,num2,average;
   cin >> num1 >> num2;
   average = ( num1 + num2 ) / 2;
   cout << "I am " << num1 << endl << "You are " << num2 << endl << "We are around " << average << endl;
 return 0;
}
```

Sample Input

```
28
24
```

Sample Output

```
I am 28
You are 24
We are around 26
```

Result

Thus, Program " **You and Me** " has been successfully executed