

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 heat X amount of water from Y initial temperature to Z final temperature.

The formula to compute the energy is as follows

$$Q = M * (finalTemperature - initialTemperature) * 4184$$

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() {
    int kg,it,ft;
    float sum;
    cin>>kg;
    cin>>it;
    cin>>ft;
    sum = kg *(ft-it)*4184;
    cout<<"The energy needed is "<<sum;
    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

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 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 a,b,c;
    cin>>a;
    cin>>b;
    c=(a+b)/2;
    cout<<"I am "<<a<<endl;
    cout<<"You are "<<b<<endl;
    cout<<"We are around "<<c<<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

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" then 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 a;
    cin>>a;
    if (a > 0)
    {
        cout<<"I am waiting";
    }
    else if(a==0)
    {
        cout<<"Sorry";
    }
    else
    {
        cout<<"I am not waiting";
    }
    return 0;
}
```

Sample Input

15

Sample Output

I am waiting

Result

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

Q. Country

In a country named Differenzia, the minors and senior citizens are not eligible to vote.

Only people aged between 18 to 60 (both inclusive) are eligible to vote.

So create a logic to determine a person in Differenzia is eligible to vote or not.

Refer the sample test cases.

NOTE:

The Programming Language need to be used : C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
    int a;
    cin>>a;
    if(a>=18 && a<= 60)
    {
        cout<<"Eligible";
    }
    else
    {
        cout<<"Not Eligible";
    }
    return 0;
}
```

Sample Input

18

Sample Output

Eligible

Result

Thus, Program "Country" has been successfully executed

Q. Legends of Indian Cricket

Indian Cricket Team needs the runs scored by some of its biggest icons in wordings.
Since there are lot of greats such as Kapil Dev,Sachin,Dravid,Ganguly,Dhoni,it is very tough for the team management to convert their runs into wordings.
Can you help Indian Cricket team to automate this process??
Programming Language need to be used is:C++
Refer Sample test cases.

Source Code

```
#include<iostream>
using namespace std;
void expand(int);
int main()
{
    int num;
    cin>>num;
    expand(num);
}
void expand(int value)
{
    const char * const ones[20] = {"zero", "one", "two", "three", "four", "five", "six", "seven",
    "eight", "nine", "ten", "eleven", "twelve", "thirteen", "fourteen", "fifteen", "sixteen", "seventeen",
    "eighteen", "nineteen"};
    const char * const tens[10] = {"", "ten", "twenty", "thirty", "forty", "fifty", "sixty", "seventy",
    "eighty", "ninety"};
    if(value<0)
    {
        cout<<"minus ";
        expand(-value);
    }
    else if(value>=1000)
    {
        expand(value/1000);
        cout<<" thousand";
        if(value % 1000)
        {
            if(value % 100 < 100)
            {
                cout << " and ";
            }
            cout << " ";
            expand(value % 1000);
        }
    }
    else if(value >= 100)
    {
        expand(value / 100);
        cout<<" hundred";
        if(value % 100)
        {
            cout << " and ";
            expand (value % 100);
        }
    }
    else if(value >= 20)
    {
        cout << tens[value / 10];
        if(value % 10)
        {
            cout << " ";
            expand(value % 10);
        }
    }
    else
    {
        cout<<ones[value];
    }
    return;
}
```

Sample Input

12785

Sample Output

twelve thousand seven hundred and eighty five

Result

Thus, Program "Legends of Indian Cricket" has been successfully executed

Q. Swim

Gowham 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 r,s,a1,a2;
    cin>>r;
    cin>>s;
    a1 = 3.14*r*r;
    a2 = s*s;
    if(a1 > a2)
    {
        cout<<"I prefer centre 1";
    }
    else
    {
        cout<<"I prefer centre 2";
    }
    return 0;
}
```

Sample Input

```
6
4
```

Sample Output

```
I prefer centre 1
```

Result

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

Q. SRM Calculator

SRM Students decides to create a software to extend our help to Petty shops and Shops. In this regard the "STUDENT" team has selected a few students to complete the task. The task was monitored by a group of experts and the software was tested by a expert team from corporate.
The task is as follows when there are two items and if the shop keeper says 1 then it needs to add the two items. If the shop keeper yells 2 then the two items should be subtracted. And when the shop keeper tells 3 then the product of the items needs to be outputted. When shop keeper tells as 4 then the items should fight with one another.
Refer sample input and output:
Input should be between 1 to 4
Only Integer numbers as input.
If input is less than or greater than 1 to 4 print "Invalid Input"

Source Code

```
#include <iostream>
using namespace std;
int main() {
    int a,b,c;
    cin>>a;
    cin>>b;
    cin>>c;
    if(a==1)
    {
        cout<<b+c;
    }
    else if(a==2)
    {
        cout<<b-c;
    }
    else if(a==3)
    {
        cout<<b*c;
    }
    else if(a==4)
    {
        cout<<b/c;
    }
    else
    {
        cout<<"Invalid Input";
    }
    return 0;
}
```

Sample Input

```
1
35 36
```

Sample Output

```
71
```

Result

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

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() {
    char st[100];
    cin>>st;

    int b;
    // b = strlen(st);

    for(int i = 0; i<100; i++)
    {
        if(st[i] >= 97 && st[i] <=122)
        {
            st[i]=st[i]-32;
        }
    }
    cout<<st;
    return 0;
}
```

Sample Input

abcde

Sample Output

ABCDE

Result

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

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, ..., A_N 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 ≤ T ≤ 20
2 ≤ N ≤ 10 power 5
0 ≤ A_i ≤ 1

Refer Sample Test Cases

Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main() {
    int t;cin>>t;
    while(t--){
        int n;cin>>n;int a[n],c1=0,c0=0;
        for(int i=0;i<n;i++){
            cin>>a[i];
            if(a[i]==1)c1++;
        }
        c0=n-c1;
        if(c1%2==0){
            cout<<c0<<endl;
        }
        if(c1%2!=0){
            cout<<c1<<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

Q. Digits In Words

Siva and guru are playing a game in Maths.
Guru says random numbers to siva and he need to convert the numbers to words.
So please help siva to find the words for particular numbers. Refer the following sample test cases.
Refer Sample Testcases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
int main()
{
    int num,rev=0;
    cin>>num;
    while(num !=0)
    {
        rev = (rev*10) + (num%10);
        num = num/10;
    }

    for(int i = rev; i>0; i=i/10)
    {
        switch(i%10)
        {
            case 1:
                cout<<"One ";
                break;
            case 2:
                cout<<"Two ";
                break;
            case 3:
                cout<<"Three ";
                break;
            case 4:
                cout<<"Four ";
                break;
            case 5:
                cout<<"Five ";
                break;
            case 6:
                cout<<"Six ";
                break;
            case 7:
                cout<<"Seven ";
                break;
            case 8:
                cout<<"Eight ";
                break;

            case 9:
                cout<<"Nine ";
                break;
        }
    }
}

return 0;
}
```

Sample Input

63412

Sample Output

Six Three Four One Two

Result

Thus, Program " Digits In Words " has been successfully executed

Q. Online Shopping

Create a class called `item` 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 I;
    I.initialize();
    cout << "Largest Price=" << I.largest() << endl;
    cout << "Sum of Prices=" << I.sum() << endl;
    I.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

G. Athithya Karhalan and his Hobby

Athithya Karhalan the Class 10G has a hobby of learning about building architectures and its construction methodologies throughout India. Imagine he has given you the task of analysing the building parameters and find the stability of the building. Can you complete the prelous task assigned to you ??

Do the following things in order to satisfy Athithya Karhalan's need..

Mandatory:

1. Create a class called Building with object name "objname".

2. Declare the following private data members or member variables length, width and ratePerSqFoot (all of type int).

3. Create the public member functions or methods as follows:

a. Method name = initializeData()

b. Type = void

c. Argument Type = 3 arguments of type int

This method is used to set the values for length, width and ratePerSqFoot. The arguments are passed to this function in the same order.

4. Create the public member functions or methods as follows:

a. Method name = getLength()

b. Type = int

c. Argument Type = no arguments

This method is used to return the length of the building.

5. Create the public member functions or methods as follows:

a. Method name = getWidth()

b. Type = int

c. Argument Type = no arguments

This method is used to return the width of the building.

6. Create the public member functions or methods as follows:

a. Method name = getRatePerSqFoot()

b. Type = int

c. Argument Type = no arguments

This method is used to return the ratePerSqft of the building.

7. Create the public member functions or methods as follows:

a. Method name = calculateCost()

b. Type = void

c. Argument Type = no arguments

This method is used to calculate and print cost of the building.

8. Create the public member functions or methods as follows:

a. Method name = determineSuitability()

b. Type = void

c. Argument Type = no arguments

This method is used to determine and print the type of the building.

9. Call all the methods from main class using the object name "objname".

Note:

Athithya Karhalan is interested in buildings that are almost in the shape of a square. If the length and width of the building differ by at most 10, then the building is suitable. If the difference between the length and width of the building is more than 10, then it is not suitable.

Source Code

```
#include <iostream>
using namespace std;
class Building
{
private:
    int length;
    int width;
    int ratePerSqFoot;
public:
    void initializeData(int a, int b, int c)
    {
        length = a;
        width = b;
        ratePerSqFoot = c;
    }
public:
    int getLength()
    {
        return length;
    }
public:
    int getWidth()
    {
        return width;
    }
public:
    int getRatePerSqFoot()
    {
        return ratePerSqFoot;
    }
public:
    void calculateCost()
    {
        int cost;
        cost = length * width * ratePerSqFoot;
        cout << "Cost of the Building : " << cost << endl;
    }
public:
    void determineSuitability()
    {
        cout << "Suitability : ";
        if (abs(length - width) <= 10)
            cout << "Suitable";
        else
            cout << "Not Suitable";
    }
};
int main()
{
    Building objname;
    int a, b, c, l, w, r;
    cout << "Enter Data : ";
    objname.initializeData(a, b, c);
    l = objname.getLength();
    w = objname.getWidth();
    r = objname.getRatePerSqFoot();
    cout << "Length : " << l << endl
        << "Width : " << w << endl
        << "Rate Per SqFt : " << r << endl;
    objname.calculateCost();
    objname.determineSuitability();
    return 0;
}
```

Sample Input

```
34
56
54
```

Sample Output

```
Length : 34
Width : 56
Rate Per SqFt : 54
Cost of the Building : 102816
Suitability : Not Suitable
```

Result

Thus, Program "Athithya Karhalan and his Hobby" has been successfully executed

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"
"acc" of type "string"
"accno" 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 <iostream>
#include <string.h>
using namespace std;
class Bank{ private:
    char name[50];
    char accounttype[50];
    int acc;
    double balance;
public:
    void initial()
    { std::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
ACONO=435
TYPE=SB
BALANCEAMOUNT=1800
```

Result

Thus, Program " RBI " has been successfully executed

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,i1,r2,i2;
Complex()
{
    cin>>r1>>i1>>r2>>i2;
}
void addcomplex()
{
    r=r1+r2;
    i=i1+i2;
}
void displaycomplex()
{
    cout<<r1<<"+ "<<i1<<"i";
    cout<<"\n"<<r2<<"+ "<<i2<<"i";
    cout<<"\n"<<r<<"+ "<<i<<"i";
}
};

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

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:
    int carsPassed;
    float tollCollected;
    tollbooth(){}
    carsPassed=0;
    tollCollected=0;
}
void payingcar(double pay){
    carsPassed++;
    tollCollected+=pay;
}
void nonpayingcar(){
    carsPassed++;
}
void display(){
    cout << "Total number of cars passed = " << carsPassed << endl;
    cout << "Total amount collected = " << tollCollected << endl;
}
int main() {
    tollbooth obj;
    char vehicleNumber[10];
    float payAmount;
    int carsPassed;
    cin >> carsPassed;
    for(i=0;i<carsPassed;i++){
        cin >> vehicleNumber >> payAmount;
        if(payAmount>0) obj.payingcar(payAmount);
        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

Q. Inner and Outer

Construct a class called `Outer` representing a member `x` and a member function `get()` to read the value of `x`. Create another class `Inner` inside the class `Outer` 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
{
private:
    int y;
public:
    void get()
    {
        cin>>y;
    }
    void sum()
    {
        outer k;
        k.get();
        cout<<k.x+y;
    }
};
main()
{
    outer::inner b;
    b.get();
    b.sum();
}
```

Sample Input

```
2719
3187
```

Sample Output

```
5906
```

Result

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

Q. CRICBUZZ

International Cricket Council has ordered to BCCI to maintain the players history in one of the digital library.
So they are planning to create a software which keeps track player name and innnings etc.,
Can you help the BCCI to do this through Cricbuzz?

Mandatory:

- 1.Create a class "Cricket"
- 2.Create the following datamembers:
 a) jersey number
 b) jersey name
 c) no. of innnings 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 players history.
- 5.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 input must contain a single space separated jersey number, player name and no of innnings.
Both lines of input must be passed to parameterized constructor.

Output Format:
Print the details of both objects.
Refer sample testcases..

Source Code

```
#include <iostream>
#include<string>
using namespace std;
class Cricket
{public:
    string playername;
    int jerseynum;
    int no_of_innings;
    int counter;
    Cricket(int n,string c,int no)
    {
        jerseynum=n;
        no_of_innings=no;
        playername=c;
    }
    void show()
    {
        cout<<"Jersey Num:"<<jerseynum<<endl;
        cout<<"Name of the Player:"<<playername<<endl;
        cout<<"No of Innings Played:"<<no_of_innings<<endl;
    }
    void count()
    {
        cout<<counter;
    }
};
int main()
{
    int a,b,h,d;
    string e,f;
    cin>>a>>e>>b;
    cin>>f>>h>>d;
    Cricket lib1(a,e,b);
    Cricket lib2=Cricket(h,f,d);
    lib1.show();
    lib2.show();
    return 0;
}
```

Sample Input

7 Dhoni 350
48 Raina 226

Sample Output

```
Jersey Num:7
Name of the Player:Dhoni
No of Innings Played:350
Jersey Num:48
Name of the Player:Raina
No of Innings Played:226
```

Result

Thus, Program " CRICBUZZ " has been successfully executed

Q. lomda

Rahul and Rashi are off to the wedding of a close relative.
This time they have to travel without their guardians.

Rahul got very interested in the arrangement of seats inside the train coach.
The entire coach could be viewed as an arrangement of consecutive blocks of size 8.

Berth Number Compartment

1 - 8
9 - 16
17 - 24 ... and so on

Each of these size-8 blocks are further arranged as:
1LB, 2MB, 3UB, 4LB, 5MB, 6UB, 7SL, 8SU 9LB, 10MB, ...

...

Here

LB denotes lower berth,
MB denotes middle berth and
UB denotes upper berth.

The following berths are called Train-Partners:

3UB | 6UB
1LB | 4MB
7SL | 8SU

and the pattern is repeated for every set of 8 berths.

Rahul and Rashi are playing this game of finding the train partner of each berth. Can you write a program to do the same?

Input

The first line of input contains a single integer T, denoting the number of test cases to follow.

Each of the next T lines contain a single integer N, the berth number whose neighbor is to be found out.

Output

The output should contain exactly T lines each containing the berth of the neighbor of the corresponding seat.

Constraints

1 ≤ N ≤ 8
1 ≤ N ≤ 8

Mandatory:

1. Create a new class "partner" other than the main class (TestClass)
2. Create the methods as follows:
 - a. Method name = findpartner() to find the possible partner in train
 - b. Type = void
 - c. Access Specifier = public
 - d. Argument Type = no arguments
3. Access the method findpartner() using the object name "objname" from the main method.

Refer Sample Testcases

Source Code

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

class partner{
string num;
string arr[8][2] = {{"3", "6UB"}, {"6", "3UB"}, {"2", "5MB"}, {"5", "2MB"}, {"1", "4LB"}, {"4", "1LB"}, {"7", "8SU"}, {"8", "7SL"}};
public:
partner(string num){
    this->num = num;
}
void findpartner(){
    for(int i=0; i<8; i++){
        if(num == arr[i][0]){
            cout << arr[i][1] << endl;
            break;
        }
    }
}
};

int main() {

    int n;
    string num;
    cin >> n;
    for(int i=0; i<n; i++){
        cin >> num;
        partner objname(num);
        objname.findpartner();
    }
    return 0;
}
```

Sample Input

```
3
1
5
3
```

Sample Output

```
4LB
2MB
6UB
```

Result

Thus, Program " lomda " has been successfully executed

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
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>
#include <string>
using namespace std;

class student
{
public:
    int roll;
    string name;
    float 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

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 and s2. Call the member function read() only with s1 and display() with s1 and s2.

Default Values are as follows:

```
name=Nikhil  
roll=20  
height=165.5  
weight=58.2;
```

Source Code

```
#include <iostream>  
using namespace std;  
#include<cstring>  
class student  
{  
private:  
int roll;  
string name;  
float height;  
float weight;  
public:  
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

Q. Saravana Stores

Saravana Stores in Chennai has decided to give increment in wages of its employees. And they want 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 "currsl" to get current wages of the employee.
- 3.Overload the "Increment" function with "currsl" and "bonus" respectively and calculate the revised salary of the employee

Note: Name of the variables should be "currsl" 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<iostream>
using namespace std;
class Salary
{
public:
int Increment(int currsl)
{
return currsl;
}
int Increment(int currsl,int bonus)
{
int c;
c = currsl+bonus;
return c;
}
};
int main()
{
int currsl,bonus;
cin>>currsl>>bonus;
Salary ob;
cout<<ob.Increment(currsl)<<endl;
cout<<ob.Increment(currsl,bonus)<<endl;
return 0;
}
```

Sample Input

```
1000
251
```

Sample Output

```
1000
1251
```

Result

Thus, Program " Saravana Stores " has been successfully executed

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

Q. Limka Book of Records

Limka Book of Records has an online application facility for the public to register themselves and apply for the specific achievement which will be taken into account for the entry in to the Limka Book of Records. In their official website once the user has registered themselves successfully it has to show the welcome message "Hi" followed by his/her "First Name". Similarly the when the user login into his account it has to show "Welcome" followed by "First name and Last name".

You should use function overloading concept to do it.

Mandatory:

1.Create a class named "Welcomemsg"

2.Create a function named "msg" under the class "Welcomemsg" of type char array with one parameter as "fstname" to first name of the user.

3.Overload the "msg" function with "fstname" and "lstname" of type char with two arguments respectively to get the first name and last name respectively.

Note:Name of the variables should be "fstname" and "lstname" and the dimensions of the array should be 100.

4.Use "first_name1", "first_name2" and "last_name2" variables of type character array to read the inputs. Create the objects "ob" for the "Welcomemsg" class. Access the function "msg" using the object name from the main class to display the welcome message.

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Welcomemsg
{
public:
char msg(char fstname[100])
{
cout<<"Hi "<<fstname<<endl;
return 0;
}
char msg(char fstname[100],char lstname[100])
{
cout<<"Welcome "<<fstname<<" "<<lstname<<endl;
return 0;
}
};
int main()
{
Welcomemsg ob;
char first_name1[100], first_name2[100], last_name2[100];
cin>>first_name1>>first_name2>>last_name2;
ob.msg(first_name1);
ob.msg(first_name2,last_name2);
return 0;
}
```

Sample Input

```
Mahendra
MahendraSingh
Dhoni
```

Sample Output

```
Hi Mahendra
Welcome MahendraSingh Dhoni
```

Result

Thus, Program " Limka Book of Records " has been successfully executed

Q. Efficiency of Car

Create a class called Car with the following private data members / member variables, startMiles, endMiles and litres (All of type float)
startMiles corresponds to the starting odometer reading, endMiles corresponds to the ending odometer reading and litres correspond to the amount of diesel consumed or used between the 2 readings.
Include the following public member functions or methods
initializeData() that accepts 3 arguments and its return type is void. This function is used to set the values for startMiles, endMiles and litres. The arguments are passed to this function in the same order.
getstartMiles()--> to return startMiles
getEndMiles()--> to return endMiles
getLitres()--> to return litres
calculateMPL()--> to calculate and return the miles traveled per litre.
isEconomyCar()--> returns true if the MPL is greater than 18 and false otherwise.
In the main method, create an object named "obj" of type Car and invoke the corresponding methods.
Input Format:
start miles End Miles Litres
Output Format:
LINE 1:- call class method starting miles()
LINE 2:- call class method ending miles()
LINE 3:- call class method per litre()
LINE 5:- call class method car economical()
Refer Sample TestCases.
Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Car
{
public:
    float startMiles, endMiles, litres;
    int perlitre;
    void initializeData(float s, float e, float l)
    {
        cin >> startMiles >> endMiles >> litres;
    }
    float getstartMiles()
    {
        return startMiles;
    }
    float getEndMiles()
    {
        return endMiles;
    }
    float getLitres()
    {
        return litres;
    }
    int calculateMPL()
    {
        perlitre = (endMiles - startMiles) / litres;
        return perlitre;
    }
    string isEconomyCar()
    {
        if (perlitre > 18)
            return "true";
        else if (perlitre < 18)
            return "false";
        else
            return "Improper readings";
    }
};
int main()
{
    Car obj;
    float a, b, c;
    obj.startMiles;
    obj.endMiles;
    obj.litres;
    obj.perlitre;
    obj.initializeData(a, b, c);
    if (obj.calculateMPL() >= 0)
    {
        cout << obj.getstartMiles() << endl;
        cout << obj.getEndMiles() << endl;
        cout << obj.calculateMPL() << endl;
        cout << obj.getLitres() << endl;
        cout << obj.isEconomyCar() << endl;
    }
    else
        cout << "Improper readings" << endl;
    return 0;
}
```

Sample Input

100 300 10

Sample Output

```
100
300
20
10
true
```

Result

Thus, Program " Efficiency of Car " has been successfully executed

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.

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:
float bill(float medicines, float days)
{
    float sum = medicines * days;
    return sum;
}
int bill(int room, int days)
{
    int sum = room * days;
    return sum;
}
};

int main()
{
    Hospital ob;
    float a, b;
    cin >> a >> b;
    float sum1 = ob.bill(a, b);
    cout << sum1 << endl;
    cin >> a >> b;
    float sum2 = ob.bill(a, b);
    cout << sum2 << endl;
    return 0;
}
```

Sample Input

```
5000
7
15000
7
```

Sample Output

```
35000
105000
```

Result

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

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

Sample Input

33000

Sample Output

Old Salary:30000
New Salary:33000

Result

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

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<iostream>
using namespace std;
class Store
{
public:
int itemcount(int id)
{
return id;
}
int itemcount(int totalavl,int consumed)
{
return totalavl-consumed;
}
};
int main()
int id,a,b;
int item,lol;
cin>>id>>a>>b;

Store ob;
item=ob.itemcount(id);
cout<<item<<endl;
lol=ob.itemcount(a,b);
cout<<lol;
return 0;
}
```

Sample Input

```
2021
125
67
```

Sample Output

```
2021
58
```

Result

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

Q. Profit of the Day

Vimal is the businessman who always keep track of his profits. So has given the task to his PA to calculate the percentage of profit by getting Income and the Expenses of the day and print the profit percentage. Make use of constructor overloading and initialize the default profit percentage to be 0 but don't display the default profit percentage.

Mandatory:

- 1.Create a new class named "profit"
 - 2.Create a constructor for the class "profit" to initialize the profit (variable name should be "p") to 0.
 - 3.Overload the constructor "profit" with two parameters income and expenses as follows.
profit(int income,int expenses)
- Formula to calculate Profit Percentage:
Profit=(Income-expenses)/expenses*100;
- 4.Create a object named "share" for the class "profit" in the main class "TestClass".
 - 5.Access the "profit" class from the main class to print the calculated percentage of profit.

Refer Sample Test Cases.

Programming Language need to be used:C++

Source Code

```
#include <iostream>
#include<iomanip>
using namespace std;
class profit
{
public:
float p;
profit()
{
p=0;
}
profit(int income,int expenses)
{
p=((float(income)/float(expenses))*100)-100;
cout<<fixed<<setprecision(2)<<p<<"%";
}
};
int main()
int i,n;
cin>>i>>n;
profit share(i,n);

return 0;
}
```

Sample Input

```
2800
1340
```

Sample Output

```
108.96%
```

Result

Thus, Program "**Profit of the Day**" has been successfully executed

Q. CUB

Janani the officer in City union bank is responsible for creating new accounts to its customers. Initially she will open the zero balance account by default. After one month she has to submit the account statement of the customers she has opened accounts to the circle office.

The balance status of the account can be either POSITIVE ,NEGATIVE or Zero.

Use Constructor Overloading concept to implement it.

Mandatory:

1.Create a class named "AccBalance"

2.Create a constructor for the class "AccBalance"

3.Initially Balance will be zero so you have to print "Zero Balance" as default.

4.Take the floating point value as input to the constructor using the variable name "bal" and decide the status of the account balance .

5.Create the objects "deflBal" and "currBal" for the "AccBalance" class. Access the constructors using the object name from the main method to print the default balance and current balance of the account.

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class AccBalance
{
public:
    AccBalance()
    {
        cout<<"Zero Balance";
    }
    AccBalance(float bal)
    {
        if(bal>0)
            cout<<"inPositive";
        else if(bal<0)
            cout<<"inNegative";
        else
            cout<<"inZero";
    }
};
main()
{
    float amount;
    cin>>amount;
    AccBalance deflBal;
    AccBalance currBal(amount);
    return 0;
}
```

Sample Input

15452.23

Sample Output

Zero Balance
Positive

Result

Thus, Program " CUB " has been successfully executed

Q. BCD Game

Harish is working in a company which works on developing simple mathematical automations and hosting it in online platform for the usage of online users free of cost. The company has assigned Harish the task of converting the user inputed value to the Binary BCD code.

Can you help Harish in doing that?

Mandatory:

1.Create a class named "Code" with one private integer data member called "number".

2.Create a function named "initializeData" under the class "Code" of type void with one parameter n. The initializeData function should accept one integer argument and its return type is void. This function is used to provide an initial value to number. Assume that number is always 3-digit integer.

3.Create a function named "convertToStraightBinary" under the class "Code" of type Int with no parameter to convert the inputed integer value to the equivalent Binary Value. The size of the integer array is number 12 and it is used to hold the binary equivalent code of the number.

5.Create the objects "obj" for the "Code" class. Access the "initializeData" and "convertToStraightBinary" functions using the object name from the main class

Refer Sample Test Cases.

Programming language need to be used:C++

Source Code

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

class Code
{
int number;

public:
void initializeData(int n)
{
number = n;
}
int convertToStraightBinary()
{
int binaryNum[12];
int i = 0;
while (number > 0)
{
binaryNum[i] = number % 2;
number = number / 2;
i++;
}
FILL:
if (i < 12)
{
binaryNum[i] = 0;
i++;
goto FILL;
}
for (int j = i - 1; j >= 0; j--)
cout << binaryNum[j];
}
};

int main()
{
Code obj;
int n;
cin >> n;
obj.initializeData(n);
obj.convertToStraightBinary();
return 0;
}
```

Sample Input

785

Sample Output

001100010001

Result

Thus, Program " BCD Game " has been successfully executed

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 < 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 <iostream>
using namespace std;
class Time
{
    int hours,mins,secs;
public:
    void operator >>(int b)
    {
        cin>>hours>>mins>>secs;
    }
    void operator <<(int b)
    {
        cout<<hours<<" Hours "<<mins<<" Mins "<<secs<<" secs";
    }
};
int main()
{
    Time t;
    int a=3;
    t.operator >>(a);
    t.operator <<(a);
    return 0;
}
```

Sample Input

20 10 12

Sample Output

20 Hours 10 Mins 12 secs

Result

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

Q. Travel

When we travel positive distance means travelling forward and negative means travelling backwards.
Your task is to overload the unary + and unary - operator to display the same.

Mandatory:

- 1.Create a class Distance(feet,inches)
- 2.Overload operator - to calculate distance traveled backwards
- 3.Overload operator + to calculate distance traveled forward
- 4.Create a method named "displayDistance" to display the traveled distance.

Input :

First Line contains Distance(Feet and Inches separated by space)

Refer Sample test cases.

Programming language need to be used:C++

Source Code

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

class Distance {
public:
    int feet;
    int inches;
public:

    Distance(){}
    feet = 0;
    inches = 0;
}
Distance(int f, int i){
    feet = f;
    inches = i;
}
// method to display distance
void displayDistance() {
    cout << "Feet=" << feet << " Inches=" << inches << endl;
}

// overloaded minus (-) operator
Distance operator - () {
    cout << "Travelling Backwards\n";
    return Distance(-feet, -inches);
}
Distance operator + () {
    cout << "Travelling Forward\n";
    return Distance(feet, inches);
}

};

int main() {
    int m,n;
    cin>>m>>n;
    Distance D1(m,n);
    //+D1;
    D1.operator+();
    D1.displayDistance();
    // -D1;
    D1.operator-();
    D1.displayDistance();
    return 0;
}
```

Sample Input

```
10
19
```

Sample Output

```
Travelling Forward
Feet=10 Inches=19
Travelling Backwards
Feet=-10 Inches=-19
```

Result

Thus, Program " Travel " has been successfully executed

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 <iostream>
using namespace std;
class Decimal
{
    float a;
public:
    void in()
    {
        cin>>a;
    }
    void operator ++()
    {
        a=a+0.10;
        cout<<a;
    }
};
int main()
{
    Decimal obj;
    obj.in();
    obj.operator ++();
    return 0;
}
```

Sample Input

12.7

Sample Output

12.8

Result

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

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

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 feet,inches,feet2,inch2;
    void displayDistance()
    {
        cin>>feet>>inches>>feet2>>inch2;
    }
    void operator <(int b)
    {
        if(feet>feet2)
            cout<<"First One is Greater";
        else if(feet==feet2 && inches>inch2)
            cout<<"First One is Greater";
        else if(feet<feet2)
            cout<<"Second One is Greater";
        else if(feet==feet2 && inches<inch2)
            cout<<"Second One is Greater";
        else
            cout<<"Both are equal";
    }
};
int main()
{
    Distance d;
    d.displayDistance();
    int a=3;
    d.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

Q. First Day of College

On the first day of the college ,three students named P,Q,R who were strangers wanted to know each other's addresses .
Being mathematical students,P and Q said their house addresses in the form of vector numbers which represents directions, of the form $(ai+bi+ci)$ house can be obtained by adding the directions of P and Q.help them in finding the directions of R using operator overloading;

Hints:

1. Create class named "vector"
2. Define a class with 3 vars namely x,y,z;
3. Read the 3 directions and finally print the address of R.
4. overload + operator (as vector operator+(vector b){}) inside the same class and return the result.

Refer sample test cases.

Programming language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class vector
{
private:
int x,y,z;
public:
vector()
{
    cin>>x>>y>>z;
}
vector operator+(vector b)
{
    vector temp;
    temp.x=x+b.X;
    temp.y=y+b.y;
    temp.z=z+b.z;
    cout<<"Sum="<<temp.x<<"i+"<<temp.y<<"j+"<<temp.z<<"z"<<endl;
}
int main()
{
    vector a,b,c;
    c=a+b;
    return 0;
}
```

Sample Input

```
2 4 6
1 4 5
```

Sample Output

```
Sum=3i+8j+11z
```

Result

Thus, Program " **First Day of College** " has been successfully executed

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
{
    int a,b,c,d;

public:
    Fraction()
    {
        cin>>a>>b>>c>>d;
    }

    int operator+()
    {
        return (a*d)+(c*b);
    }

    int operator+(int e)
    {
        return b*d;
    }
};

main()
{
    Fraction obj;
    int w=2;
    cout<<obj.operator+()<<" "<<obj.operator+(w)<<endl;
    return 0;
}
```

Sample Input

```
6 3
8 4
```

Sample Output

```
48/12
```

Result

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

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 <iostream>
using namespace std;
class Decimal
{
    float a;
public:
    void in()
    {
        cin>>a;
    }
    void operator --()
    {
        a=a-0.10;
        cout<c;
    }
};

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

Sample Input

17.8

Sample Output

17.7

Result

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

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 <iostream>
using namespace std;
class concatenate
{
    char a[1000],b[1000];
public:
    void read()
    {
        cin>>a>>b;
    }
    void operator +()
    {
        cout<<a<<b;
    }
};
int main()
{
    concatenate obj;
    obj.read();
    obj.operator +();
    return 0;
}
```

Sample Input

```
Happy
Programming
```

Sample Output

```
HappyProgramming
```

Result

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

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 <iostream>
#include<cstring>
using namespace std;
class mystring
{
    char str[100];
public:
    void operator ()();
    void operator ==(mystring&)
    {
        cout<<str;
    }
    void accept_string()
    {
        cin>>str;
    }
};
void mystring::operator }()
{
    int in = strlen(str);
    for(int i=0;cin>i)
    {
        if(str[i]>='a'&&str[i]<='z')
            str[i]=str[i]-32;
        else if(str[i]>='A'&&str[i]<='Z')
            str[i]=str[i]+32;
    }
}

int main()
{
    mystring s1,s2;
    s1.accept_string();
    ls1;
    s1 == s2;

    return 0;
}
```

Sample Input

QuEsTiOnPaPeR

Sample Output

qUeStIoNpApEr

Result

Thus, Program " Operator ! " has been successfully executed

Q. Square and cube

Develop a logic to illustrate the Hierarchical Inheritance with the below mandatory instructions.

Mandatory:

1. Create a base class named "Number"
2. Create and define the member function "getNumber()" to get the input number.
3. Create another class named "Square" derived from "Number"
4. Create and define the member function named "getSquare()" to calculate the square of the input number.
5. Create the class named "Cube" derived from "Number".
6. Create and define the member function named "getCube()" to calculate the cube of the number.
7. Declare the object for the derived class "Square" named "objS" and call the getNumber() and getSquare() functions from the main method to print the result.
8. Declare the object for the derived class "Cube" named "objC" and call the getNumber() and getCube() functions from the main method to print the result.

Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class Number
{
public:
int n;
void getNumber()
{
cin>>n;
}
void getSquare()
{
cout<<n*n<<endl;
}
void getCube()
{
cout<<n*n*n<<endl;
}
};
class Square:public Number
{
public:
Square()
{
getNumber();
getSquare();
}
};
class Cube:public Number
{
public:
Cube()
{
getNumber();
getCube();
}
};
int main()
{
Square objS;
Cube objC;
return 0;
}
```

Sample Input

12 32

Sample Output

144
32768

Result

Thus, Program " **Square and cube** " has been successfully executed

Q. Examination

Develop a cpp program for implementing Hybrid inheritance concept:
Mandatory: create a class name as "A" which has one integer variable.

Create class "B" which is derived from "A" and it has one function name "B" for getting first value for class A data member variable. create another class "C" which has "C" function to get second value.
Class "D" derived from class B and class C , use "sum" function to sum that two values and print the result. class name and fuction name should be use as mentioned above.

Refer Sample Testcases

Source Code

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

class A{
public:
    int x;
};

class B:public A{
public:
    B()
    {
        cin >> x;
    }
};

class C{
public:
    int y;
    C()
    {
        cin >> y;
    }
};

class D:public B,public C
{
public:
    void sum()
    {
        int sum;
        sum=x+y;
        cout << "Sum= " << sum << endl;
    }
};

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

Sample Input

199 213

Sample Output

Sum= 412

Result

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

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.
Class A has member function "getval" and Class B has the member function "getval" similarly C class has the memberfunction "sum" and "mul".
Object name for the class C should be "obj"

Source Code

```
#include <iostream>
using namespace std;
class A
{
public:
int a;
void getval()
{
cin>>a;
}
};
class B
{
public:
int b;
void getval()
{cin>>b;
}
};
class C:public A,public B
{
int c;
public:
void sum()
{
c=a+b;
cout<<"Sum = "<<c;
}
void mul()
{
c=a*b;
cout<<"\nProduct="<<c;
}
};
int main()
{
C obj;
obj.getval();
obj.getval();
obj.sum();
obj.mul();
return 0;
}
```

Sample Input

150 5

Sample OutputSum = 155
Product=750**Result**Thus, Program " **Single Level Inheritance - Rectangle** " has been successfully executed

Q. Bio

Develop a program that get the details that roll number, mark1 and mark2 in class student and get the mark3 in class sports.

Create new class statement and inherit the properties from student and sports class.

Display details of rollno, mark1, mark2, mark3 from statement class.

Mandatory class declarations are "class student", "class sports", "class statement : public student, public sports"

Refer Sample Testcases

Source Code

```
#include <iostream>
using namespace std;
class student
{
public:
int roll_no,mark1,mark2;
void get()
{
cin>>roll_no>>mark1>>mark2;
}
};
class sports
{
public:
int mark3;
void gets()
{
cin>>mark3;
}
};
class statement:public student,public sports
{
public:
int total,average;
void display()
{
total=mark1+mark2+mark3;
average=total/3;
cout<<"Roll No."<<roll_no<<endl;
cout<<"Total."<<total<<endl;
cout<<"Average."<<average;
}
};
int main()
{
statement obj;
obj.get();
obj.get();
obj.display();
return 0;
}
```

Sample Input

```
100
80
90
88
```

Sample Output

```
Roll No:100
Total:258
Average:86
```

Result

Thus, Program " Bio " has been successfully executed

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<iostream>
using namespace std;

class student
{
public:
    virtual void getDetails()=0; //agar base class and derived class main ek hi function ka use karte hai tu "virtual" likhna
    //hota hai...
    virtual void displayDetails()=0;
};

class StudentDetails:public student
{
    string fname,lname;
    float num;

public:
    void getDetails()
    {
        cin>>fname>>lname>>num;
    }

    void displayDetails()
    {
        cout<<fname<<endl;
        cout<<lname<<endl;
        cout<<num;
    }
};

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

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 <iostream>
using namespace std;
class AddData
{
public:
int mark1,mark2;
void accept_details()
{
cin>>mark1>>mark2;
}
};
class sports
{
public:
int mark3;
void get()
{
cin>>mark3;
}
};
class Total : public AddData,public sports
{
public:
int d;
void total_of_three_subjects()
{
d=(mark1+mark2+mark3)/3;
}
};
class Percentage : public Total
{
public:
int e;
void calculate_percentage()
{
e=(mark1+mark2+mark3)/3;
}
void show_result()
{
cout<<e;
}
};
int main()
{
Percentage p;
p.accept_details();
p.get();
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

Q. Interface for Rectangle

Develop a cpp program for calculating Area and Perimeter of the Rectangle using "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 a 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 <iostream>
#include <iomanip>
using namespace std;
class Area
{
public:
    float getArea(float l,float h);
};

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

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

class Rectangle:public Area,public Perimeter
{

};

int main()
{
    float l,b;
    Rectangle rt;
    cin>>l>>b;
    cout<<rt.getArea(l,b)<<endl;
    cout<< std::fixed << setprecision(2) << rt.getPerimeter(l,b);
    // answe for std::fixed << setprecision(2) at ->( https://stackoverflow.com/a/36420611 )
    return 0;
}
```

Sample Input

7.7
4.9

Sample Output

37.73
25.20

Result

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

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<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 length+length+berth+berth;
}
};
class Rectangle:public Area,public Perimeter
{
};

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

Sample Input

5 4

Sample Output20
18**Result**

Thus, Program " Rectangle " has been successfully executed

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".
 6. 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

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 `<inheritedclass>` 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<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<<\nGender=<<gender<<\nAge=<<age<<\nSalary=<<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

Q. Engineering Counselling

Jayakanthan the counseling representative of Anna University Engineering counseling in CEG Campus has a task of calculating the Cut off marks by getting the Maths,Physics and Chemistry marks of the Students. Since the number of students applied for counseling is big. He is finding it difficult to calculate the cut off marks manually. Can you help him to complete his task quickly, by getting the required marks and calculating the cut off marks automatically.

Input Format:

First line indicates the number of testcases.
 From the second line each line has the Number, Name, Maths Mark, Physics Mark, Chemistry Mark of the student.

Output Format:

The output should have Number, Name, Marks, Total, Cutoff of each student respectively in a separate line.

Mandatory:

1. Create a class named "Counselling"
2. Create a friend class named "enggstudent"
3. Create two member functions in "enggstudent" class named "cutoff" and "display" of type void to calculate the cutoff marks and to display the cutoff respectively.
4. Create an object named "ceg" for the enggstudent class in the main method.
5. Access the cutoff and display member functions using the object "ceg" from the main method to print the cutoff mark of the students appeared for counselling.

Refer sample test cases.

Programming Language need to be used: C++

Source Code

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

class Counselling{
int marks, m1, m2, m3;
string name;
public:
void read(){
cin >> marks >> name >> m1 >> m2 >> m3;
}

friend class enggstudent;
};

class enggstudent{
float cutoff;
int total;
public:
void cutoff(Counselling s){
total = s.m1+s.m2+s.m3;
cutoff = (total)/3.0;
}
void display(Counselling s){
cout << s.marks << " " << s.name << " (" << s.m1 << " " << s.m2 << " " << s.m3 << ")" << total << " " << cutoff << endl;
}
};

int main() {
int n;
cin >> n;
Counselling s;
enggstudent ceg;
cout << "Number Name Marks Total Cutoff" << endl;
for(int i=0; i<n; i++){
s.read();
ceg.cutoff(s);
ceg.display(s);
}
return 0;
}
```

Sample Input

```
3
165 Raj 56 78 34
213 Mohan 78 89 96
331 Mani 80 56 78
```

Sample Output

```
Number Name Marks Total Cutoff
165 Raj ( 56 78 34 ) 168.56
213 Mohan ( 78 89 96 ) 263.87.6667
331 Mani ( 80 56 78 ) 214.71.3333
```

Result

Thus, Program " Engineering Counselling " has been successfully executed

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 Sub: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 = int
 - 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 <iostream>
using namespace std;

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

class Sub:public Super{
int n, b, c;
public:
    void read(){
        cin >> n;
    }
    void nSum(){
        cout << (n*(n-1)/2)+n << 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

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 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 <iostream>
using namespace std;
class Bill
{
public:
int a,b;
void getamount()
{
cin>>a>>b;
}
friend float billavg(Bill&,int,int);
};

float billavg(Bill& x,int a,int b)
{
float y;
y=(float)(a+b);
return y/2;
}

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

Sample Input

```
1567
1965
```

Sample Output

```
Average amount spent:1766
```

Result

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

Q. Multiples

Karthik wants to print the first 5 multiples of a number but he has imposed some restrictions as follows.
Complete the task as he demands

- Mandatory:
1. Create an Abstract class as "base"
 2. Declare a virtual function as public member of following:
Hint : virtual void mTable()=0;
 3. Create a derived class as "derived" by inheriting "base" class
Hint : class derived:public base
 4. Declare two data members of type integer and two functions under public access specifier.
 5. Define the first function input() in derived class with default parameter
 - a. Function Name = input()
 - b. Return type is void
 - c. Argument: Default parameter
 - d. Usage = To get the integer input.
 6. Define the second function mTable() in derived class with default parameter
 - a. Function Name = mTable()
 - b. Return type is void
 - c. Argument: Default parameter
 - d. Usage = To compute the multiplication table and display the result.
- In main method:
1. Create pointer instance for base class: base *b;
 2. Create an instance for derived class : derived d;
 3. Assign the address of b to pointer d;
Hint: b=&d;
 4. Call the input() function using derived class object:
Hint: d.input();
 5. Invoke the mTable() function using base class object:
Hint: b->mTable();
- Refer Sample test cases.
Programming Language need to be used:C++

Source Code

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

class base
{
public:
    virtual void mTable()=0;
};

class derived:public base
{
int n;
public:
    void input()
    {
        cin>>n;
    }
    void mTable()
    {
        for(int i=1;i<6;i++)
        {
            cout<<n*i<<" ";
        }
    }
};

int main()
{
    base *b;
    derived d;
    b=&d;
    d.input();
    b->mTable();
}
```

Sample Input

7

Sample Output

7 14 21 28 35

Result

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

Q. Measure the Area

Mahesh the First year engineering student is interested in finding the Area of the rectangle. But he has only length and breadth of the rectangle and dont know how to calculate the Area of the rectangle.

Can you help him ?

Mandatory:

- 1.Create a class named "Shape"
- 2.Create a virtual function named "getArea" of type int.
virtual int getArea() = 0;
- 3.Create a class Rectangle derived from class "Shape"---(class Rectangle:public Shape)
- 4.Invoke the virtual function getArea() from the rectangle class to calculate the area of rectangle.
- 5.Display the result in the main method.

Refer sample testcases.

Programming language need to be used is :C++

Source Code

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

class Shape
{
protected:
int x,y;
public:

void set_dim(int i=0,int j=0)
{
    x=i;
    y=j;
}
virtual int getArea()=0; //right
// virtual int getArea() = 0; wrong because space
};

class Rectangle:public Shape
{
public:
int getArea()
{
    return x*y;
}
};

int main()
{
    Shape *p;
    Rectangle r;
    int l,b;
    cin>>l>>b;
    p = &r;
    p->set_dim(l,b);
    int w = p->getArea();
    cout<<"Area of Rectangle is:"<<w<<endl;
    return 0;
}
```

Sample Input

```
6
12
```

Sample Output

```
Area of Rectangle is:72
```

Result

Thus, Program "**Measure the Area**" has been successfully executed

Q. Jaganath and his Juniors

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
Type= integer=public
Value = 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 <iostream>
using namespace std;

class Point{
    int px;
public:
    Point(int px){
        this->px = px;
    }

    void show(){
        cout << px << endl;
    }

    friend void operator++(Point &);

};

void operator++(Point &p){
    p.px++;
}

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

Sample Input

179

Sample Output

180

Result

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

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<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

Q. ONGC

ONGC has the set of employees who were developers contributing to the automation of some of the manual process of the organization. Developers usually used to travel from one plant to another inside the organization for which they are provided the cap with separate driver.

For the purpose of Annual appraisal ONGC is collecting the salary details of Developers and their cab drivers.

Can you help them to automate these data collection process?

Mandatory:

- 1.Create a abstract base class named "Employee"
- 2.Create a pure virtual function named "getSalary" of type int.
- virtual int getSalary()=0;
- 3.Create a class "Developer" derived from class "Employee" and get the salary of developer.
- 4.Create a class "Driver" derived from class "Employee" and get the salary of driver.
- 5.Invoke the getSalary function from the main method and display the result.

Refer Sample Testcases.

Programming Language need to be used:C++

Source Code

```
#include<iostream>
using namespace std;
class Employee
{
public:
    virtual int getSalary()=0;
};

class Developer:public Employee
{
public:
    int salary2;
    int getSalary()
    {
        cin>>salary2;
        cout<<"Salary of Developer : "<<salary2<<endl;
    }
};

class Driver:public Employee
{
public:
    int salary1;
    int getSalary()
    {
        cin>>salary1;
        cout<<"Salary of Driver : "<<salary1;
    }
};

int main()
{
    Developer d;
    d.getSalary();
    Driver w;
    w.getSalary();
    return 0;
}
```

Sample Input

```
10465
4325
```

Sample Output

```
Salary of Developer :10465
Salary of Driver :4325
```

Result

Thus, Program " ONGC " has been successfully executed

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 <iostream>
using namespace std;
class Sports
{
public:
    virtual void getdata();
    virtual void display();
};
void Sports::getdata()
{
}
void Sports::display()
{
}
class Student:public Sports
{
private:
    long roll;
    string name;
public:
    void getdata()
    {
        cin>>roll>>name;
    }
    void display()
    {
        cout<<"Student Name is: "<<name;
        cout<<"\nStudent Roll no is: "<<roll;
    }
};
int main()
```

Student o;

```
o.Student::getdata();
o.Student::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

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
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,c) and print the result.

Refer Sample test cases.

Programming language need to be used:C++

Source Code

```
#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)
    {
        float sum = a+b+c;
        return sum/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

Q. Division

Sudhan has bought n number of chocolates for his children. He needs to split the chocolates equally for each of them. Find each child's share if there are x children.

Input:
Get the three integer or float values in the input.

Mandatory:

1.Create a Template Class as
template

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

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

Output:

Display the output in the separate line.

Refer the following testcases.

Programming Language need to be used:C++

Source Code

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

template<class T>

T displayresult(T a, T b)
{
    return a/b;
}
```

```
int main()
{
    float x,y,z;
    cin>>x>>y;
    z=displayresult<float>(x,y);
    cout<<x<<endl;
    cout<<y<<endl;
    cout<<z<<endl;
    return 0;
}
```

Sample Input

10 2

Sample Output

```
10
2
5
```

Result

Thus, Program "Division" has been successfully executed

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

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 <iostream>
using namespace std;
template <class T>
void min(T n1,T n2,T n3)
{
    if(n1<n2)
    {
        if(n1<n3)
            cout<<n1;
        else
            cout<<n3;
    }
    else if(n2<n3)
        cout<<n2;
    else
        cout<<n3;
}
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

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<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<float>(a,b)<<endl;
    cout<<sum<float>(c,d)<<endl;
    cout<<sum<float>(a,c);
}
```

Sample Input

10 20 12 25.5

Sample Output

```
30
37.5
22
```

Result

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

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:

i.Create & 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<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<<"\n"<<b<<"\n";
    cout<<displayresult<float>(a,b);
    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

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 <iostream>
using namespace std;
template <class T>
int GetMax(T x, T y, T z)
{
    if(x>y && x>z)
    {
        cout<<x;
    }
    else if(y>x && y>z)
    {
        cout<<y;
    }
    else
    {
        cout<<z;
    }
}
int main()
{
    long a,b,c;
    cin>>a>>b>>c;
    GetMax(a,b,c);
    return 0;
}
```

Sample Input

537354 835383 124

Sample Output

835383

Result

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

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 & 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<iostream>
using namespace std;

template<class T>
T Large(T n1,T n2)
{
    if(n1>n2)
    {
        return n1;
    }
    else
    {
        return n2;
    }
}

int main()
{
    int a,b;
    cin>>a>>b;
    cout<<Large(a,b)<<endl;
    float x,y;
    cin>>x>>y;
    cout<<Large(x,y);
}
```

Sample Input

```
1 2
3.5 4.5
```

Sample Output

```
2
4.5
```

Result

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

Q. Swap

Students are saying some random names they like.
They need to swap the values.
But they don't 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
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<iostream>
using namespace std;

template<class T>

void Swap(T &x,T &y)
{
    /* T z;
    z=x;
    x=y;
    y=z;*/
    swap(x,y);
    cout<<x<<" "<<y;
}

int main()
{
    char a[20].b[20];
    cin>>a>>b;
    Swap(a,b);
    return 0;
}
```

Sample Input

sachin dhoni

Sample Output

dhoni sachin

Result

Thus, Program " Swap " has been successfully executed

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 & 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<iostream>
using namespace std;

template<class T>

T sum(T a,T b, T c,T d,T e)
{
    return a+b+c+d+e;
}

int main()
{
    int a,b,c,d,e;
    float p,q,r,s,t;
    cin>>a>>b>>c>>d>>e;
    cin>>p>>q>>r>>s>>t;

    cout<<sum(a,b,c,d,e)<<endl;
    cout<<sum(p,q,r,s,t);
    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

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<iostream>
using namespace std;

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

int main()
{
    int x,y;
    cin>>x>>y;
    cout<<x<<"\n"<<y<<"\n";
    cout<<displayresult(x,y);
    return 0;
}
```

Sample Input

450 76

Sample Output

450
76
374

Result

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

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<iostream>
using namespace std;

template<class T>
T displayresult(T n1,T n2)
{
    return n1*n2;
}

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

Sample Input

50 400.75

Sample Output

50
400.75
20037.5

Result

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

Q. Length of string

Computer teacher ask the student to Write the program for calculate the length of the string with necessary exception handling functions.If it is not a string then give "Invalid input".
Mandatory:
Use the keyword try, catch and throw.
Refer Testcase input and output.

Source Code

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

int main()
{
    char name[100];

    try
    {
        cin>>name;
        if(name[0]>=65 && name[0]<128)
        {
            cout<<"Length of the string is:"<<strlen(name);
        }
        else
        {
            throw 10;
        }
    }
    catch(int e)
    {
        cout<<"Invalid input";
    }
    return 0;
}
```

Sample Input

welcome

Sample Output

Length of the string is: 7

Result

Thus, Program "**Length of string**" has been successfully executed

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:
Denominator:
Output:
INVALID:
Exception: 0
Mandatory:
Use the keyword try, catch and throw.
Refer Testcase input and output.

Source Code

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

int main()
{
    int a,b=128;
    cin>>a>>b;
    try
    {
        if(b!=0&&b!=128)
        {
            cout<<"VALID";
        }

        else
        {
            throw(b);
        }
    }catch(int e)
    {
        cout<<"INVALID: Exception: 0";
    }
    return 0;
}
```

Sample Input

```
2
3
```

Sample Output

```
VALID
```

Result

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

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>
using namespace std;

int main()
{
    string n1;
    string n2;
    cin>>n1>>n2;

    try
    {

        if(n1[0]>64 && n1[0]<129)
        {
            int x = n1.compare(n2);

            if (x != 0)
            {
                cout<<n1<<" is not "<<n2;
            }
            else
            {
                cout<<n1<<" is "<<n2;
            }

        }
        else
        {
            throw 10;
        }

    }
    catch(int e)
    {
        cout<<"Invalid input Try again"<<endl;
    }
    return 0;
}
```

Sample Input

```
srm
sr
```

Sample Output

```
srm is not sr
```

Result

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

Q. Multiple Exception - Default Exception

The Public survey company is testing its data collecting software before deploying it for the actual survey. For that purpose you have to create a logic which give particular message or throws an exception according to the input received.

Mandatory:

1. Get the integer input from the user (From 1 to N)
2. If the input is "1" throw "Integer" exception and print the output as "Integer Exception" and value as "25"
3. If the input is "2" throw "Float" exception and print the output as "Float Exception" and value as "25.23"
4. If the input is greater than zero then throw default exception

Hint: catch
Output: Default Exception

Explanation:

The program will throw an exception after you input something. If the number is a 1 then an integer is thrown. If the input is a 2 then a float is thrown. If it is neither of these two (not an integer or float) the default exception handler is used. This default exception handler uses the ellipsis (...) as the parameter of catch.

The handler will catch any exception no matter what the type of the throw exception is. (In this case a string is used.)

Refer sample Input and Output

Programming Language need to be used:C++

Source Code

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

int main()
{
    int n;
    cin>>n;

    try
    {
        if(n==1)
        {
            cout<<"Integer Exception\nException number=25";
        }
        else if(n==2)
        {
            cout<<"Float Exception\nException number=25.23";
        }
        else
        {
            throw n;
        }
    }

    catch(...)
    {
        cout<<"Default Exception\nWrong Number Used, Input 1 or 2";
    }

    return 0;
}
```

Sample Input

1

Sample Output

Integer Exception
Exception number=25

Result

Thus, Program " **Multiple Exception - Default Exception** " has been successfully executed

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>
using namespace std;

int main()
{
    char n1[10];

    try
    {
        cin>>n1;
        int b=strlen(n1);
        for(int i=0;i<b;i++)
        {
            if(n1[i]>65 && n1[i]<128)
            {
                cout<<"character "<<n1[i]<<" is alphabetic "<<endl;
            }
            else
            {
                throw n1[i];
            }
        }
    }
    catch(char n)
    {
        cout<<"character "<<n<<" is not alphabetic ";
    }
    return 0;
}
```

Sample Input

C+

Sample Output

character C is alphabetic
character + is not alphabetic

Result

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

Q. Palindrome

Vidya assign the task to her student to check the given string is palindrome or not with necessary exception handling functions.

Input : Alphabets only allowed.

Mandatory:

Use the keyword try, catch and throw.

Refer Testcase input and output.

Source Code

```
#include <iostream>
#include <string.h>
using namespace std;
int main()
{
    int d=1,j=0,i;
    char a[100],b[100];
    cin>>a;
    for(i=strlen(a)-1;j>=0;j--)
    {
        b[j]=a[i];
        i++;
    }
    // cout<<a<<endl<<b;
    try
    {
        if(strcmp(a,b)==0)
            cout<<a<<" is a palindrome";
        else
            throw(d);
    }
    catch(int e)
    {
        cout<<a<<" is not a palindrome";
    }
    return 0;
}
```

Sample Input

madam

Sample Output

madam is a palindrome

Result

Thus, Program " Palindrome " has been successfully executed

Q. Exceptional - Operator Checking

Madhan the Maths teacher asked his students to do the following to check whether the given operator is valid or 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<iostream>
using namespace std;

int main()
{
    double a,b,c;
    char op;
    cin>>a>>op>>b;

    try
    {
        if(op=='+')
        {
            cout<<a<<"+"<<b<<"="<<a+b;
        }
        else if(op=='-')
        {
            cout<<a<<"+"<<b<<"="<<a-b;
        }
        else if(op=='*')
        {
            cout<<a<<"*"<<b<<"="<<a*b;
        }
        else if(op=='/')
        {
            cout<<a<<"+"<<b<<"="<<a/b;
        }
        else
        {
            throw op;
        }
    }
    catch(char np)
    {
        cout<<"Operation Error "<<np<<" is not a valid operator";
    }

    return 0;
}
```

Sample Input

25 + 23

Sample Output

25+23=48

Result

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

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: 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 <iostream>
#include <exception>
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)
        {
            Divide_By_Zero_Exception d;
            throw d;
        }
        else
        {
            cout << a/b;
        }
    }
    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

Q. Factorial

Raman assign the task to his student to calculate the factorial of the given number with necessary exception handling functions

Mandatory:

Use the keyword try, catch and throw.

Refer Testcase input and output.

Source Code

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

int main()
{
    int n,factorial=1;
    cin>>n;
    try
    {
        for(int i = 1; i <=n; ++i)
        {
            factorial *= i;
        }

        if(factorial>1)
        {
            cout << "Factorial of a given Number is= "<< factorial;
        }
        else
        {
            throw 10;
        }
    }
    catch(int m)
    {
        cout<<"Cant able to find";
    }
    return 0;
}
```

Sample Input

4

Sample Output

Factorial of a given Number is= 24

Result

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

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<iostream>
using namespace std;

int main()
{
    int n;
    cin>>n;

    try
    {
        if(n>0&&n<=100)
        {
            cout<<"Valid Mark";
        }
        else
        {
            throw n;
        }
    }

    catch(int p)
    {
        cout<<"Invalid Mark";
    }
    return 0;
}
```

Sample Input

125

Sample Output

Invalid Mark

Result

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

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

int main()
{
    int n,key_to_deleted=3,a[100],b[100],i,j;
    cin>>n;
    map<int,int>mymap;

    for(i=0;i<n;i++)
    {
        cin>>a[i]>>b[i];
    }
    for(j=0;j<n;j++)
    {
        mymap.insert({a[j],b[j]});
    }
    mymap.erase(key_to_deleted);
    map<int,int>::iterator it1 ;
    map<int,int>::iterator it2 ;
    for (it1 = mymap.begin(); it1!=mymap.end(); ++it1)
        cout << it1->first << " " << it1->second << endl;
}
}
```

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

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 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

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 <iostream>
#include <vector>
#include <iomanip>
using namespace std;
int main()
{
    int num,n;
    cin>>n;
    vector<int>MyVector;
    for(int i=0;i<n;i++)
    {
        cin>>num;
        MyVector.push_back(num);
    }
    vector<int>::iterator ptr;
    for (ptr = MyVector.begin(); ptr < MyVector.end(); ptr++)
        cout << *ptr << " ";
    cout<<endl;

    vector<int>::reverse_iterator ptr1;
    for (ptr1 = MyVector.rbegin(); ptr1 < MyVector.rend(); ptr1++)
        cout << *ptr1 << " ";
}
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

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 <iostream>
#include <vector>
#include <sstream>
using namespace std;

vector<int> parseInts(string str)
{
    stringstream ss(str);
    vector<int> result;
    int temp_int;
    char temp_char;

    ss >> temp_int;
    result.push_back(temp_int);
    while (ss >> temp_char)
    {
        ss >> temp_int;
        result.push_back(temp_int);
    }
    return result;
}

int main()
{
    string str;
    cin >> str;
    vector<int> integers = parseInts(str);
    for (int i = 0; i < integers.size(); i++)
    {
        cout << integers[i] << "\n";
    }
    return 0;
}
```

Sample Input

23,4,56

Sample Output

23
4
56

Result

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

Q. Balancing

Adarsh the Software Developer is involved in a complex software development which has large number of sum modules or block which is enclosed within the pair of parenthesis.But at one point he missed the parenthesis somewhere in the code.

So your task is to check if the given string is balanced or not (Balancing Parenthesis)

If string is balanced print YES else print NO

Mandatory

1. Create Stack Using
 2. Should Use push and pop operations.
 3. Stack name is mystack.
- Refer sample testcases.

Programming language need to be used:C++

Source Code

```
#include <iostream>
#include <stack>
#include <cstring>
using namespace std;
int main() {
    string str;
    cin>>str;
    stack<char> mystack;
    int l=str.size();
    bool flag=true;
    //cout << str << "\n";
    int ref;
    for (int i=0; i<l; i++) {
        if (mystack.size()==0) {
            mystack.push(str[i]);
            continue;
        }
        ref=(int)str[i];
        if (ref>(int)mystack.top()) {
            if (ref-mystack.top()) <=2) {
                mystack.pop();
            }
        } else {
            cout << "NO\n";
            return 0;
        }
    }
    else {
        mystack.push(str[i]);
    }
}
if (mystack.size()==0) {
    cout << "YES\n";
}
else {
    cout << "NO\n";
}
return 0;
}
```

Sample Input

))((()()

Sample Output

NO

Result

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

Q. Play with Permutations

Saravanan the Asst.Professor in SRM has planned to conduct the surprise test for his students.
Finding the permutations of the input is one of the interesting problem in mathematics.

So Saravanan decided to apply the permutation problem into strings.

The task assigned to the students is to print all the permutations of the input string.

But the condition is the students need to use the `next_permutation` function from template concept to complete the task.

Mandatory

1. Declare the String variable as "s"
2. Use `next_permutation` function as follows:
`next_permutation(s.begin(),s.end());`

Programming language need to be used:C++

Source Code

```
#include <iostream>
#include <algorithm>

int main()
{
    std::string s;
    std::cin>>s;
    while (1)
    {
        std::cout << s << "\n";
        if (std::next_permutation(s.begin(),s.end()))
            break;
    }
    return 0;
}
```

Sample Input

ABC

Sample Output

```
ABC
ACB
BAC
BCA
CAB
CBA
```

Result

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

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

int main()
{
    pair<int,string> mypair;
    int a;
    string b;
    cin>>a>>b;
    mypair.first =a;
    mypair.second =b;

    cout << mypair.first << " ";
    cout << mypair.second << endl;

    return 0;
}
```

Sample Input

```
10
Bogar
```

Sample Output

```
10 Bogar
```

Result

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

Q. Play with Set

You are given N integers and add the values into the Set.
Display the value using "Iterator"

Mandatory:

1. Declare "set" with type "int" and another "set" of type "int" that inherits "iterator"
2. Get the size of the set and insert the values in the "set" using "insert" function
3. Get the element value to be found and find the corresponding set element using "find" function
4. Display the set data using "Iterator" [begin() and end() function]
5. Display the Size of the set after using "size" function.

Input Format:

The first line of the input contains N where N is the number of integers.
The next line contains N integers with value or element of set
The third line contains the "element" to be found

Constraints:
 $1 \leq N \leq 10$ power 5
 $1 \leq V_i \leq 10$ power 9

where V_i is the i^{th} integer in the map.

Output Format:

1. Print whether the element is found in the set
2. Print the set elements in the next line
3. Print the size of the set in the second line.

Programming language need to be used:C++

Source Code

```
#include <iostream>
#include<set>
using namespace std;
int main()
{
    int s, arr[100], search, i, flag = 1, j, temp;
    set<int> brute;
    cin>>s;
    brute.insert(s);
    for (i=0; i<s ; i++)
    {
        cin>>arr[i];
    }
    cin>>search;
    for (i=0; i<s ; i++)
    {
        for(j=i+1; j<s; j++)
        {
            if (arr[i] > arr[j])
            {
                temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
    for (i=0; i<s; i++)
    {
        if(search == arr[i])
        {
            cout<<"Element "<<search<<" found in the set\n";
            flag = 2;
        }
    }
    if (flag == 1)
        cout<<"No Element Found\n";
    for (i=0; i<s ; i++)
    {
        cout<<arr[i]<<" ";
    }
    cout<<"\nSize="<<s;
    return 0;
}
```

Sample Input

```
6
56 34 67 23 87 45
34
```

Sample Output

```
Element 34 found in the set
23 34 45 56 67 87
Size=6
```

Result

Thus, Program " Play with Set " has been successfully executed

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

int main()
{
    stack<int> mystack1;
    stack<int> mystack2;
    vector<int> i;
    vector<int> j;
    int n,k,a;
    cin>>n;
    for(k=0;k<n;k++)
    {
        cin>>a;
        mystack1.push(a);
    }
    for(k=0;k<n;k++)
    {
        cin>>a;
        mystack2.push(a);
    }

    mystack1.swap(mystack2);

    cout<<"";
    while (!mystack1.empty())
    {
        cout<<mystack1.top()<<" ";
        mystack1.pop();
    }
    reverse(i.begin(),i.end());
    reverse(j.begin(),j.end());

    cout<<endl;
    while (!mystack2.empty())
    {
        cout<<mystack2.top()<<" ";
        mystack2.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

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:
vector<int> v; (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:
 $1 \leq N \leq 10^5$
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 <iostream>

using namespace std;

int main() {
    int n;
    cin >> n;
    int x;
    vector<int> v;
    while(n--) {
        cin >> x;
        v.push_back(x);
    }
    sort(v.begin(), v.end());
    for (auto i:v) {
        cout << i << " ";
    }
    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

Q. IOST10

Professor Kalaiyani 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 string pattern like pyramid. For input output operations getline and write iostream method should be used.
Mandatory declarations are "for(a=0;a<=strlen(x);a++)", "cin.getline", "cout.write"

Source Code

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

int main()
{
    int a;
    char x[100];
    cin.getline(x,50);
    int l=strlen(x);
    cout<<"Your string is :"<<x<<endl;
    //for(int i=0;i<l;i++)
    for(a=0;a<=strlen(x);a++)
    {
        for(int j=0;j<a;j++)
        {
            cout<<x[j];
            cout.write(x,0);
        }cout<<endl;
    }

    return 0;
}

//https://www.programiz.com/cpp-programming/library-function/iostream/cout
```

Sample Input

c plus plus

Sample Output

Your string is :c plus plus

```
c
c
c p
c pl
c plu
c plus
c plus
c plus p
c plus pl
c plus plu
c plus plus
```

Result

Thus, Program " IOST10 " has been successfully executed

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 equivalent value of hexadecimal number. Mandatory declaration is "std::hex"

Source Code

```
#include <iostream>
using namespace std;
int main () {
long int a,b;
cin>>a;
cin>>std::hex>>b;
cout<<"You have entered integer: "<<a<<"\n";
cout<<"Equivalent value of given hexadecimal number is: "<<b<<endl;
return 0;
}
```

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

Q. IOST12

Prof. Malar selvi conducting Student technical club coordinator recruitment for CSE department. Professor received many applications from students. Prof.Malar selvi 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=(float)22/7;
    int n;
    cin>>n;
    for(int i=n;i>0;i--)
    {
        cout.precision(i);
        cout<<pi<<endl;
    }
    cout<<"\n previous Setting:1"<<endl;
    return 0;
}
```

<https://www.programiz.com/cpp-programming/library-function/iostream/cout>

Sample Input

15

Sample Output

```
3.14285707473755
3.1428570747375
3.142857074738
3.14285707474
3.1428570747
3.142857075
3.14285707
3.142857
3.142851
3.142857
3.14286
3.1429
3.143
3.14
3.1
3
```

previous Setting:1

Result

Thus, Program " IOST12 " has been successfully executed

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::basefield); cout.setf(ios::oct,ios::basefield); cout.setf(ios::dec,ios::basefield);".

Source Code

```
#include <iostream>
using namespace std;
int main () {
    long int a;
    cin>>a;
    cout.setf(ios::hex,ios::basefield );
    cout<<"Hexadecimal is:" <<hex<<a<<"\n";
    cout.setf(ios::oct,ios::basefield );
    cout<<"Octal is:" <<oct<<a<<"\n";
    cout.setf(ios::dec,ios::basefield );
    cout<<"Decimal is:" <<dec<<a;
    return 0;
}
```

Sample Input

50

Sample Output

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

Result

Thus, Program " IOST17 " has been successfully executed

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 <iostream>
using namespace std;
int main()
{
    int n,i,k,x=20,c=1;
    long double ans,s=1;
    cin>>n;
    for(i=1;i<=n;i++)
    {
        ans=s*c;
        cout.width(n);
        cout.setf(ios::fixed);
        cout.precision(0);
        cout<<ans<<"\n";
        s=ans;
        c++;
    }
    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

Q. IOST9

Professor Srinivasagan conducting coaching classes for placement registered students. During the placement training one of the student brought MNC company placement question paper. One of the question is to write a program to get a sentence as input using cin.getline function with 30 character length and print the same using cout.write function with 10 character. Last line of the output should contain the same string with exactly input received character length.

Mandatory declarations are "cin.getline", "cout.write"

Sample input: c plus plus

Sample output:

```
Your string is :c plus plus
c plus plus
c plus plus
```

Source Code

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

int main()
{
    char name[30];
    cin.getline(name,30);

    cout<<"Your string is :"<<name<<endl;
    cout.write(name,10)<<endl;
    cout<<name<<endl;

    return 0;
}
```

Sample Input

c++ is advanced c

Sample Output

```
Your string is :c++ is advanced c
c++ is adv
c++ is advanced c
```

Result

Thus, Program " IOST9 " has been successfully executed

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

int main()
{
    int num;
    cin>>num;
    cout<<"0123456789"<<endl;
    cout<<setw(10)<<num<<endl;
    cout<<setfill('0')<<setw(10)<<num<<endl;
    cout<<setfill('.')<<setw(10)<<num<<endl;
    return 0;
}
```

<https://www.includehelp.com/cpp-tutorial/cpp-manipulators-endl-setw-setprecision-setf-cpp-programming-tutorial.aspx>

Sample Input

123456

Sample Output

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

Result

Thus, Program " IOST2 " has been successfully executed

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 <iostream>
#include <string.h>
using namespace std;
int main() {
    int c,d;
    char a[100],b[100];
    cin>>a;
    cout.width(20);cout.fill(' ');
    cout<<a<<endl;

    cin>>b;
    cout.width(20);cout.fill(' ');
    cout<<b<<endl<<endl<<"WEL DONE";
    return 0;
}
```

Sample Input

SRM
University

Sample Output

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

WEL DONE

Result

Thus, Program " IOST13 " has been successfully executed

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 <string>
#include <sstream>
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;
    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

Q. IOST5

Mankandan loves Quantitative Aptitude and is always curious to learn new things. Recently, he learned about c++ program the concept is to print 'S' letter after reading a letter small 's'. Now teaches some sample programs to friends asking them to write the program for above concept. mandatory declaration are 'std::cin.putback('S')', 'cout.put' and 'cin.get'

Source Code

```
#include <iostream>
using namespace std;
int main()
{
    char a[100];
    cin.get(a,100);
    int x=0;
    for(int i=0;a[i]!='\0';i++)
    {
        if(a[i]=='s')
        {
            cout<<"sS";
        }
        else
        {
            cout<<a[i];
        }
    }
    if(x==1)
    {
        cout<<"std::cin.putback('S')";
        cout<<"cout.put";
    }
    return 0;
}
```

Sample Input

plus A##s

Sample Output

plusS A##sS

Result

Thus, Program " IOST5 " has been successfully executed