Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:37:11 **Register Number:** RA2031241010094

Q. Payslip Generation

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

Refer sample Testcases:

Source Code

```
#include <iostream>
using namespace std;
class c1
{
  public:
  int length,breadth;
  c1()
  {
    cin>>length>>breadth;
  }
};
class c2:public c1
{
public:
void area(int length,int breadth)
{
cout<<2*(length+breadth);
}
};
int main()
{
  c2 one;
  one.area(one.length,one.breadth);
 return 0;
}
```

Sample Input

```
10
20
```

Sample Output

```
60
```

Result

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

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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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:38:09 **Register Number:** RA2031241010094

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;
  virtual void displayDetails()=0;
};
class StudentDetails:public Student
{
string fname,mname;
float num;
public:
void getDetails()
{
cin>>fname>>mname>>num;
}
void displayDetails()
{
cout<<fname<<endl<<mname<<endl<<num<<endl;
}
};
int main()
{
  StudentDetails sd;
  sd.getDetails();
  sd.displayDetails();
 return 0;
}
```

Sample Input

```
Jayaraman
Vani
193.45
```

Sample Output

```
Jayaraman
Vani
193.45
```

Result

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:38:36 **Register Number:** RA2031241010094

Q. Student and Sports

Mandatory:

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

Programming Language need to be used:C++

Source Code

```
#include <iostream>
using namespace std;
class student
{
  public:
  int roll,mark1,mark2;
  void get()
  {
    cin>>roll;
    cin>>mark1;
    cin>>mark2;
  }
};
class sports
{
  public:
  int sportsm;
  void getsm()
  {
    cin>>sportsm;
  }
};
class statement:public student,public sports
{
  public:
  int total,avg;
  void display()
  {
    total=mark1+mark2+sportsm;
    avg=(mark1+mark2+sportsm)/3;
    cout<<roll<<endl;
    cout<<total<<endl;
    cout<<avg;
  }
};
int main()
{
  statement obj;
  obj.get();
  obj.getsm();
  obj.display();
 return 0;
}
```

Sample Input

```
100
90
80
90
```

Sample Output

```
100
260
86
```

Result

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:39:00 **Register Number:** RA2031241010094

Q. Bank

Develop a program to find the interest.

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

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

Source Code

```
#include <iostream>
using namespace std;
class Customer
{
  public:
  string name;
  void get()
  {
    cin>>name;
  }
};
class Bank
{
  public:
  int id,acc,bal;
  void gets()
  {
    cin>>id;
    cin>>acc;
    cin>>bal;
  }
};
class Account:public Customer,public Bank
{
public:
int i;
void display()
{
i=bal*.36;
cout<<"Customer Name="<<name<<endl;
cout<<"Customer Id="<<id<<endl;
cout<<"Account No="<<acc<<endl;
cout<<"Account Balance="<<bal<<endl;
cout<<"Interest="<<i;
}
};
int main()
{
  Account obj;
  obj.get();
  obj.gets();
  obj.display();
 return 0;
}
```

Sample Input

```
shiva
12345
456789012
100000
```

Sample Output

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

Result

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:39:25 **Register Number:** RA2031241010094

Q. Interface for Rectangle

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

Source Code

```
#include <iostream>
#include<iomanip>
using namespace std;
class Area
{
  public:
float getArea(float l,float h)
{
  return l*h;
}
};
class Perimeter
{
  public:
  float getPerimeter(float x,float y)
  {
    return 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);
 return 0;
}
```

Sample Input

```
7.7
4.9
```

Sample Output

```
37.73
25.20
```

Result

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:39:52 **Register Number:** RA2031241010094

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,mark1,mark2;
  void get()
  {
    cin>>roll;
    cin>>mark1;
    cin>>mark2;
  }
};
class sports
{
  public:
  int smarks;
  void gets()
  {
    cin>>smarks;
  }
};
class statement:public student,public sports
{
public:
int total,avg;
void display()
{
total=mark1+mark2+smarks;
avg=(mark1+mark2+smarks)/3;
cout<<"Roll No:"<<roll<<endl;
cout<<"Total:"<<total<<endl;
cout<<"Average:"<<avg<<endl;
}
};
int main()
{
  statement obj;
  obj.get();
  obj.gets();
  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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:40:18 **Register Number:** RA2031241010094

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:40:41 **Register Number:** RA2031241010094

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,mark3;
  void accept_details()
  {
    cin>>mark1>>mark2>>mark3;
  }
};
class Total : public AddData
{
  public:
  int d;
  void total_of_three_subjects()
  {
    d=(mark1+mark2+mark3);
  }
};
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.total_of_three_subjects();
  p.calculate_percentage();
  p.show_result();
 return 0;
}
```

Sample Input

79 81 99

Sample Output

86

Result

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

Course: OOPS **Session:** Inheritance **Timestamp:** 2021-4-1 10:41:08 **Register Number:** RA2031241010094

Q. Single Level Inheritance - Rectangle

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

Source Code

```
#include <iostream>
using namespace std;
class A
{
  public:
  int x;
  void getxval()
  {
    cin>>x;
  }
};
class B
{
  public:
  int y;
  void getyval()
  {
    cin>>y;
  }
};
class C:public A,public B
{
  public:
  int c;
  void sum()
  {
  c=x+y;
  cout<<"Sum = "<<c<<endl;
  }
  void mul()
  {
  c=x*y;
  cout<<"Product="<<c;
  }
};
int main()
{
  C obj;
  obj.getxval();
  obj.getyval();
  obj.sum();
  obj.mul();
 return 0;
}
```

Sample Input

150 5

Sample Output

Sum = 155
Product=750

Result

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