Q1. Write a C++ Program to shown the concept of inheritance also define a specific problem where we can use this concept for solving the specified problem using the inheritance concept.

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

//Base class
class brand
{
	public:
	string brand;
};

// Sub class inheriting from Base Class
class model : public brand
{
	public:
	int model;
};

//main function
int main()
{

		model latest;
		latest.brand = "Iphone";
		latest.model = 13;
		cout << "Latest brand is " << latest.brand <<" Latest model is "<<
latest.model<<endl;

		return 0;
}
```

```
Latest brand is Iphone Latest model is 13
```

Q2. Write a C++ Program to illustrates how constructor are implemented when the classes are inherited.

```
#include <iostream>

using namespace std;

class Base

{

public:

  // default constructor

  Base()

  {

    cout << "Base default constructor\n";

  }

};


class Derived : public Base

{

 public:

  // default constructor

  Derived()

  {

    cout << "Derived default constructor\n";

  }


};


int main()

{

  Derived d;

  return 0;
```

}

```
Base default constructor
Derived default constructor
```

Q3. Write a C++ to create a class Country, State, City and Village and arrange them in hierarchical manner using the Inheritance feature.

```
#include <iostream>

using namespace std;

class country

{

public:

  country()

  {

    cout << "India\n";

  }

};


class state : public country

{

 public:


  state()

  {

    cout << "Himachal Pradesh\n";

  }


};


class city : public state

{

   public:
```

```
    city()
    {
        cout<<"Kullu\n";
    }
};

class village : public city{
    public:
    village(){
        cout<<"Malana";
    }
};
int main()
{
  village a;
   return 0;
}
```

```
India
Himachal Pradesh
Kullu
Malana
```

Q4. Write a C++ Program Where Imagine a publishing company that markets both book and audiocassette versions of its works. Create a class publication that stores the title (a string) and price (type float) of publication. From this class derive two classes: book, which adds a page count (type int); and tape, which adds a playing time in minutes (type float). Each of these three classes should have a getdata ( ) function to get its data from the user at the keyboard and a putdata ( ) function to display its data. Write a main( ) program to test the book and tape classes by creating instance of them, asking the user to fill in data with getdata( ) and then displaying data with putdata( ).

```
#include <iostream>
#include <string>

using namespace std;
```

```
class publication
{
private:
 // stores the title (a string) and price (type float) of a publication.
 string title;
 float price;
public:

 publication(){}
 //Destructor
 ~publication(){}
 // a getdata() function to get its data from the user at the keyboard
 virtual void getdata()
 {
 cout << "Enter a title of publication: ";
 cin >> title;
 cout << "Enter a price of publication: ";
 cin >> price;
 }
 //putdata() function to display its data.
 virtual void putdata()
 {
 cout << "The publication title: " << title << endl;
 cout << "The Publication price: " << price<<endl;
 }
};
// book, which adds a page count (type int),
class book :public publication
{
private:
```

```
 int pagecount;
public:
 book(){}
 //Destructor
 ~book(){}

 void getdata()
 {
 publication::getdata(); //call publication class function to get data
 cout << "Enter Book Page Count: "; //Acquire book data from user
 cin >> pagecount;
 }
 void putdata()
 {
 publication::putdata(); //Show Publication data
 cout << "Book page count: " << pagecount << endl; //Show book data
 }
};

class tape :public publication
{
private:
 // and tape, which adds a playing time in minutes (type float)
 float playingtime;
public:
 tape(){}
 //Destructor
 ~tape(){}
 void getdata()
 {
 publication::getdata();
```

```
 cout << "Enter tape playing time: ";
 cin >> playingtime;
 }
 void putdata()
 {
 publication::putdata();
 cout << "Tape's playing time: " << playingtime << endl;
 }
};
int main(void){
 book newBook;
 tape newTape;
 newBook.getdata();
 newTape.getdata();

 newBook.putdata();
 newTape.putdata();

 return 0;
}
```

```
Enter a title of publication: abc
Enter a price of publication: 100
Enter Book Page Count: 200
Enter a title of publication: def
Enter a price of publication: 200
Enter tape playing time: 20
The publication title: abc
The Publication price: 100
Book page count: 200
The publication title: def
The Publication price: 200
Tape's playing time: 20
```

Q5. Write a C++ Program to design a student class representing student roll. No. and test class drive from the student class representing score of the various subjects and sports class representing the score in the sports. The sports and test class should be inherited by a result class having the functionalities to add the score and display the final result for a student.

```
#include<iostream>
using namespace std;
class Student
{
    protected:
        int roll;
};

class Test:virtual public Student
{
    protected:
        int marks1,marks2;
        Test(int m1,int m2): marks1(m1),marks2(m2) {}
        void show()
        {
            cout<<"The marks are "<<marks1<<" & "<<marks2<<endl;
        }
};

class Sports:virtual public Student
{
    protected:
        int score;
        Sports(int s):score(s) {}
        void show()
        {
            cout<<"Score = "<<score<<endl;
        }
};

class Result:public Test,Sports
{
    public:
    Result(int r,int m1,int m2,int s) : Test(m1,m2),Sports(s)
```

```
    {
        roll = r;
    }
    void show()
    {
        cout<<"Roll : "<<roll<<endl;
        Test::show();
        Sports::show();
        cout<<"Total Marks : "<<marks1+marks2+score<<endl;
    }
};

int main()
{
    Result r(5,80,90,95);
    r.show();
    return 0;
}
```

```
Roll : 5
The marks are 80 & 90
Score = 95
Total Marks : 265
```