ASSIGNMENT 8

DATA BASE

Problem Statement :-

Design a C++ base class consisting of the data members such as name of the student, roll number and subject. The derived class consists of the data members subject code,internal assessment and university examination marks. Construct a virtual base class for the item name of the student and roll number. The program should have the facilities.

i) Build a master table
ii) List a table
iii) Insert a new entry
iv) Delete old entry
v) Edit an entry
vi) Search for a record

Learning Objectives :-

Virtual base class

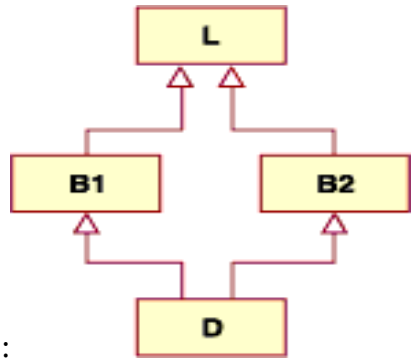
Theory :-

Virtual base classes

Suppose you have two derived classes B and C that have a common base class A, and you also have another class D that inherits from B and C. You can declare the base class A as *virtual* to ensure that B and C share the same subobject of A.

In the following example, an object of class D has two distinct subobjects of class L, one through class B1 and another through class B2. You can use the keyword virtual in front of the base class specifiers in the *base lists* of classes B1 and B2 to indicate that only one subobject of type L, shared by class B1 and class B2, exists.

For Example:

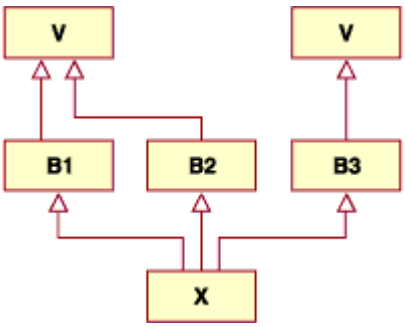


:

```
class L { /* ... */ }; // indirect base class
class B1 : virtual public L { /* ... */ };
class B2 : virtual public L { /* ... */ };
class D : public B1, public B2 { /* ... */ }; // valid
```

Using the keyword virtual in this example ensures that an object of class D inherits only one subobject of class L.

A derived class can have both virtual and nonvirtual base classes. For example:




```
class V { /* ... */ };
class B1 : virtual public V { /* ... */ };
class B2 : virtual public V { /* ... */ };
class B3 : public V { /* ... */ };
class X : public B1, public B2, public B3 { /* ... */
};
```

In the above example, class X has two subobjects of class V, one that is shared by classes B1 and B2 and one through class B3.

When two or more objects are derived from a common base class, we can prevent multiple copies of the base class being present in an object derived from those objects by declaring the base class as virtual when it is being inherited. Such a base class is known as virtual base class. This can be achieved by preceding the base class' name with the word virtual.

Consider following example:

```
class A
{
public:
int i;
};

class B : virtual public A
{
public:
int j;
};

class C: virtual public A
{
public:
int k;
};

class D: public B, public C
{
public:
int sum;
};

int main()
{
D ob;
ob.i = 10; //unambiguous since only one copy of i is inherited.
ob.j = 20;
ob.k = 30;
```

```
ob.sum = ob.i + ob.j + ob.k;
cout << “Value of i is : ”<< ob.i<<”\n”;
cout << “Value of j is : ”<< ob.j<<”\n”; cout << “Value of k is :”<< ob.k<<”\n”;
cout << “Sum is : ”<< ob.sum <<”\n”;

return 0;
}.
```

Related Mathematics :-

Phase 1:-Input :-

Here we take input as student name,roll no,subject code,internal marks,university marks. 5 variables input so we have 5 different sets

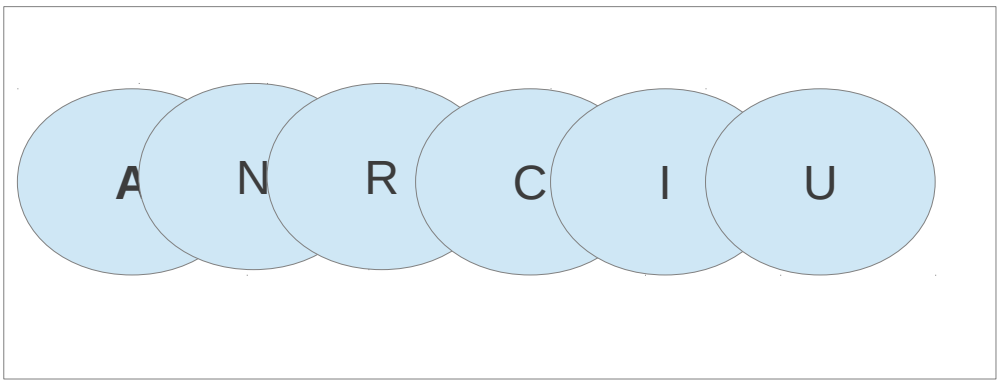
1. student_name (Set N)
2. Roll_no (Setr R)
3. Subject_code (Set C)
4. Internal_marks(Set I)
5. University_marks(Set U)

Phase 2:- Processing

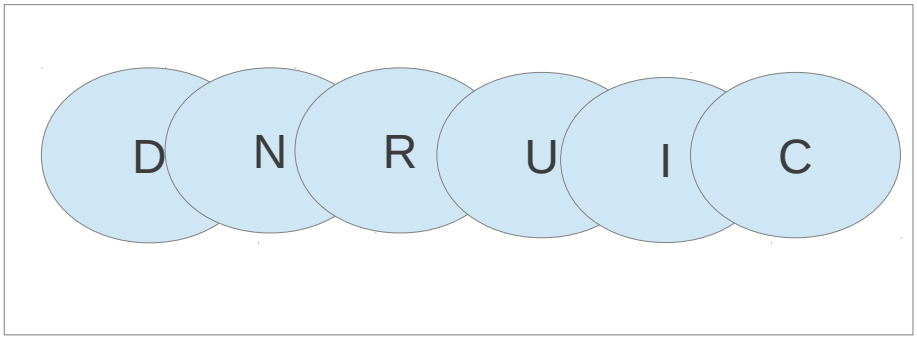
The functions which we have are

1. Accept data() Set A
2. Display data() Set D
3. Insert() Set I
4. Delete() Set De
5. Edit () Set E
6. Search() Set S

For accepting and displaying of data we take of all the inputs and the respective function for accept and display

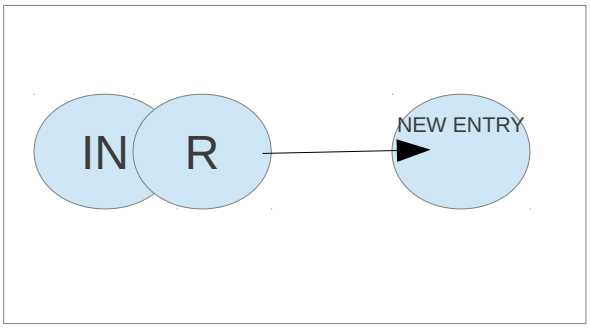


Accept data={A U N U R U C I U U}

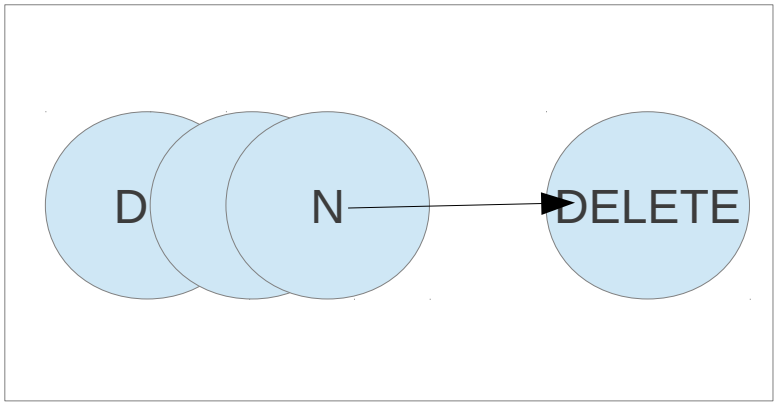


Display data={D U N U R U U I U C}

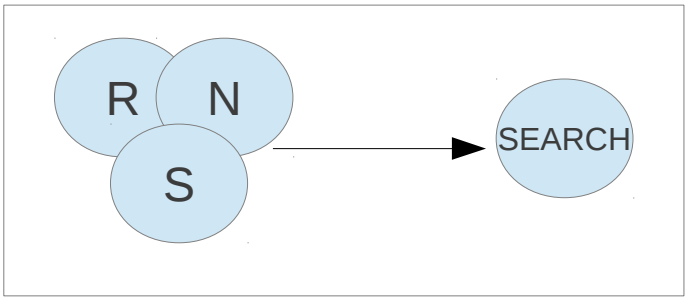
NEW ENTRY



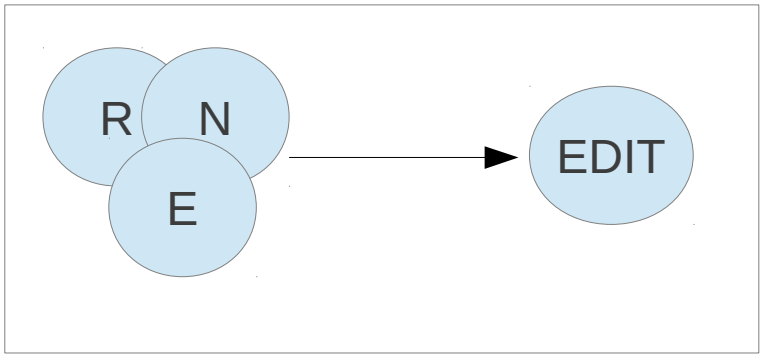
DELETE:



Search:



Edit**:**



Algorithm :-

1. start
2. define a base class with private data members for the character variables name[20] and subject[20]
3. declare member functions in public accepting and displaying the data.
4. declare member functions for searching & editing data.
5. now declare the derived class which is inherits the base class as virtual public.

6. this class contains data members declare private to store the subject code,internal marks,university marks.
7. this class contains members function for accepting,displaying and editing of the data.
8. the third class mark is declared which is actually used to progress contains data members for name,roll no.,object array of the derived class & the choice variable.
9. it contains the member functions for processing of data.
10. in the function to build a master table,we accept data from the user.This is done by the function of both base & derived class member functions for accepting data.
11. second to list a table we use the displaying functions of both base & derived class to displaying the accepted data on the screen.
12. to insert a new entry we ask the location by making the user insert new roll no. and new details we insert to the new master table.
13. simillarly for deleting any existing entry we ask for the student name & rollno. and using the search function we find the entry.
14. editing an entry includes searching of the entry in the master table and then provide a menu of existing entry by one compare with the entries in our master table.
15. in the search function,we ask for the student name & roll no. as the input from the user and then one by one compare with the entries in our master table.
16. in main function:-
17. we create an object of the class marks & call the member function process.
18. stop

Conclusion :-
Using virtual base class we can perform operations