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OOPs Using C++

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Class and Object

? What is class and object? And how many access specifier in class.

✓ **Class :-** Class is a user defined datatype, which holds its own data member and member function in other word we can say class is collection of data member and member function. Which can accessed and use by creating object of that class.

Object :- An object is an instance of a class. Whenever class is defined, no memory is allocated but when object is initialized memory is allocated of that class.

Their are three types of access specifier in class -

(I) Private
(II) Public
(III) Protected

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Declaration of class

Syntax:-

```
Class  class Name
{
  private:
    data member
    member function
  public:
    data member
    member function
  protected:
    data member
    member function
};
```

Keyword ↙

Every class Ends with Semi-Column.

Declaration of Object:

Syntax:-

```
Class name object name1
        object 2, ..... ;
```

Ex:-

```
demo ob1 , ob2 ... ;
```

Ex :-

```
Class demo
{
  private:
   int a, b;
public:
   void input ()
{
   Cout<<"Enter values";
   cin>> a>>b;
}
 Void shows ()
 {
 cout<<a<<"  "<<b;
  }
};
  Void main ()
{
   demo ob;
   ob.input ();
   ob.show ();
   getch ();
}
```

Inheritance

Inheritance is a mechanism in which one class inherits the property of other class is known as inheritance.

In other word we can say when one class access the property another class is called inheritance

Their are four types of inheritance.-

(I) Single inheritance / Simple inheritance.

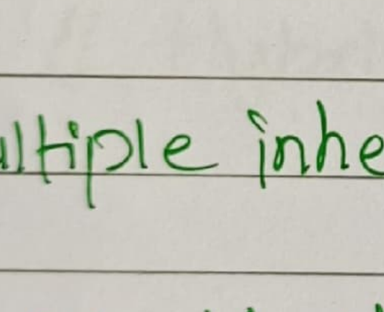
(II) Multi-level inheritance.

(III) Multiple inheritance.

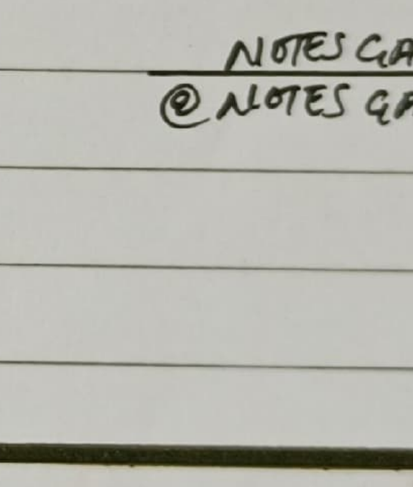
(IV) Hierarachical inheritance.

// Hybrid inheritance.

(I) Simple inheritance.



(II) Multi-level inheritance.



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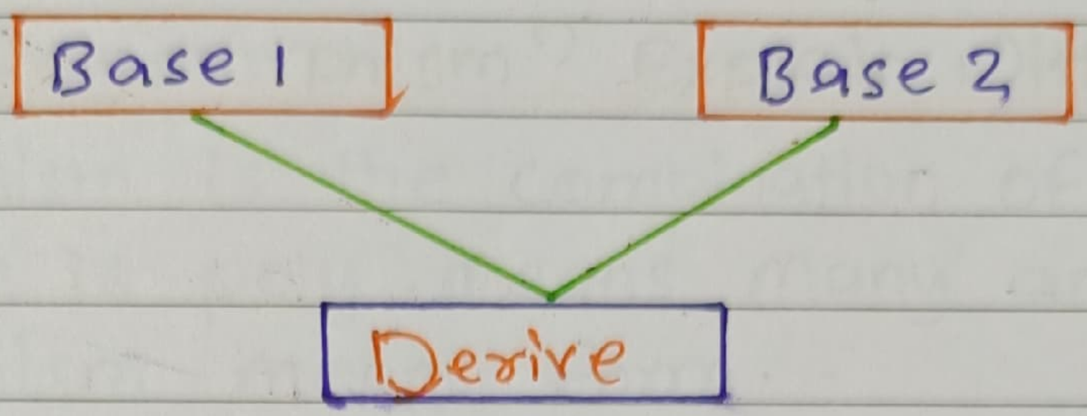
(III) Multiple - Inheritance:



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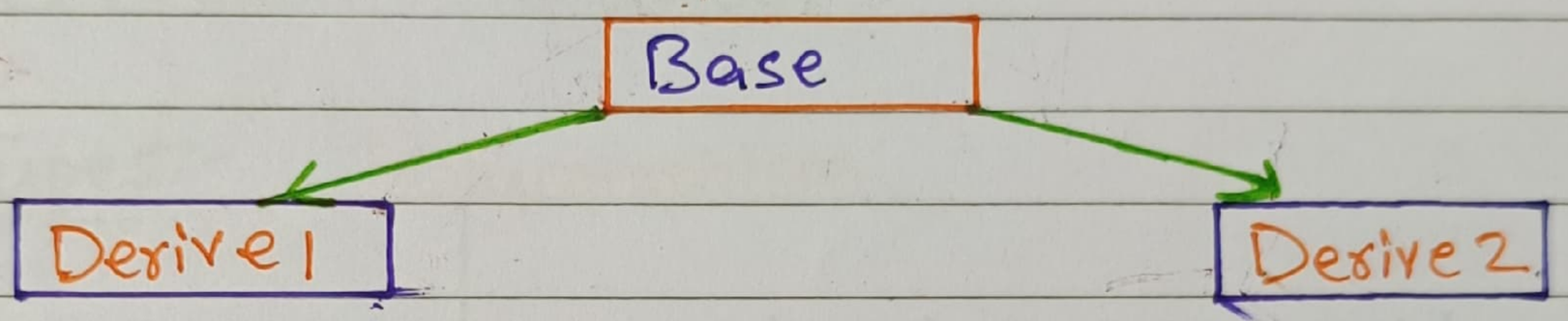
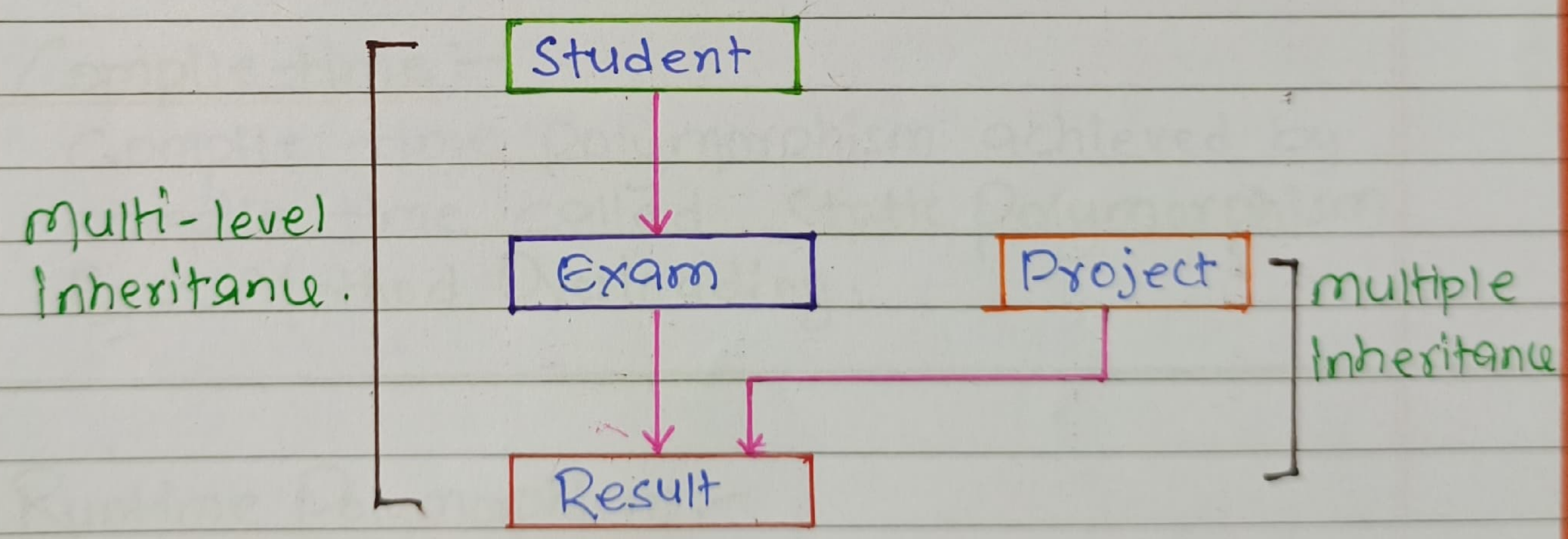
(IV) Hierarchical inheritance.



// Hybrid inheritance.



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Polymorphism.

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? What is Polymorphism? Explain with example.

✓ Polymorphism is the combination of two greek word one is poly means many and another is morphism means form.

"Whose meaning is same object having different behaviour".

Types :- Polymorphism.

- → Compile time Polymorphism.
- → Runtime Polymorphism.

① Compile time :-

Compile time polymorphism achieved by compile time called Static Polymorphism.

Ex :- Method Overloading.

② Runtime Polymorphism :-

A polymorphism which achieved by Runtime called dynamic Polymorphism.

Ex :- Method Overriding.

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Explain with example -

① Compile time

```
Void add(int x , int y )
 {

 }
Void add (int x, float y )
{

}
```

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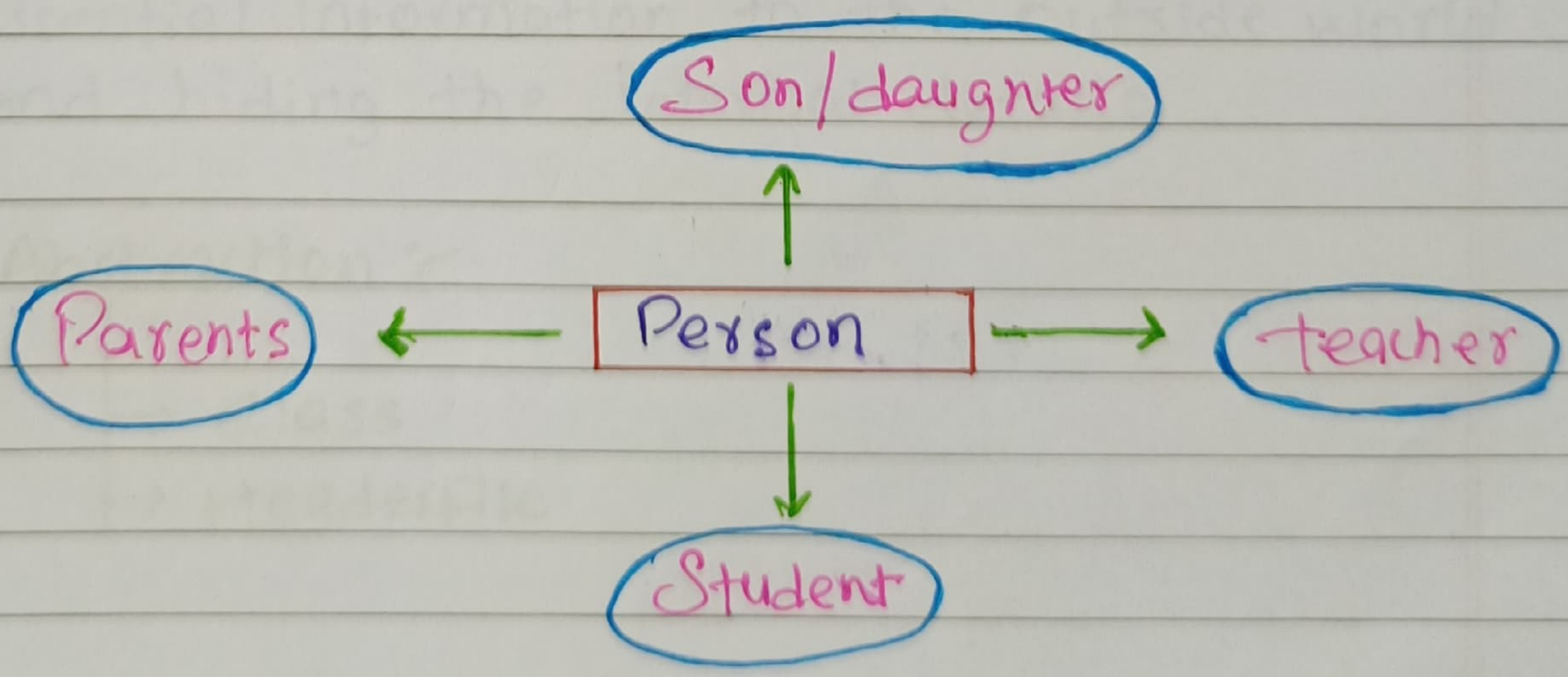
⑪ Runtime

```
Void add (-) // Base class
{
}
Void add (-) // derived
{
}
```



Encapsulation

? What is Encapsulation? Explain with example:

✓ It is one of the most important features of oops. That used to wrapping the data and function into a single unit. The data of class is not accessible to outside the class, only those function access data which are wrapped in the class.

Ex:- Class is an example of encapsulation, which talk about binding the data & function together that manuplates those data.

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Abstraction.

? What is Abstraction? Explain with example.

✓ Abstraction is the one of the most important features of OOP's which is showing only the essential information to the outside world and hiding the internal details.

Abstraction :-

- Class
- Headerfile

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Class :-

```
Class A
{
  private:
      int a = 10;  X
  public:
      void show ()
      {
          cout << a;
      }
};
  main()
  {
     A ob;
     ob. show ();
  }
```

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Headerfile :-

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```
# include < math.h >
# include < iostream.h >

  main ()
{
     int a=4, b;
     b = Sqrt ( a );
     cout < ch;
}
```