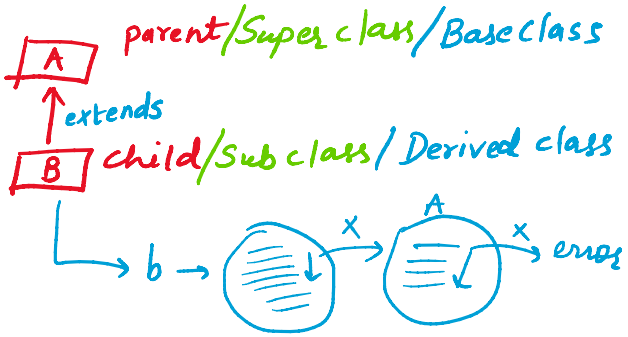
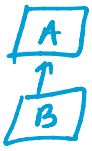
Inheritance ⟶ Reusability

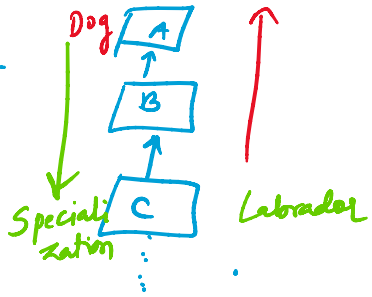
21 October 2022 06:49 PM



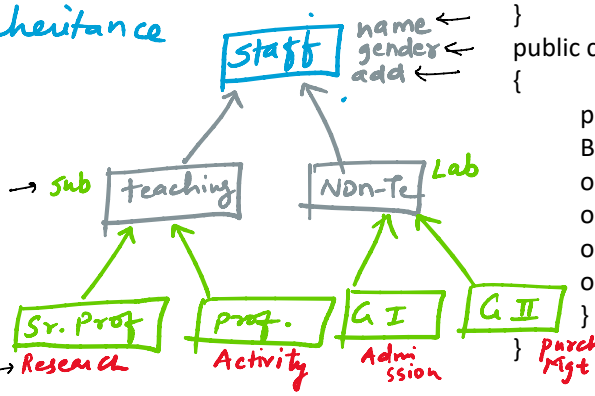
1) Single Inheritance



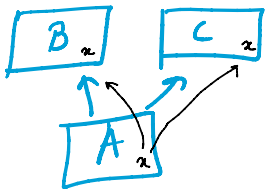
2) Multilevel Inheritance



3) Hierarchical Inheritance



4) Multiple Inheritance (Interfaces)




```
import java.util.*;
class A
{
   A()
   {
      System.out.println("Constructor of A class");
   }
}
class B extends A
{
    B()
   {
      System.out.println("Constructor of B class");
```

```
import java.util.*;
class A
{
   int a;
   Scanner s=new Scanner(System.in);
   void inputA()
   {
      System.out.println("Please enter A value");
      a=s.nextInt();
   }
   void displayA()
   {
      System.out.println(" A value is "+a);
   }
}
class B extends A
{
   int b;
   void inputB()
   {
      System.out.println("Please enter B value");
      b=s.nextInt();
   }
   void displayAplusB()
   {
      System.out.println(" Addition is "+(a+b));
   }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B();
        obj.inputA();
        obj.displayA();
        obj.inputB();
        obj.displayAplusB();
        }
}
```

```
import java.util.*;
class A
{
   int a;
   Scanner s=new Scanner(System.in);
   void inputA()
   {
      System.out.println("Please enter A value");
      a=s.nextInt();
   }
   void displayA()
   {
      System.out.println(" A value is "+a);
   }
}
class B extends A
{
```

```
    B()
    {
       System.out.println("Constructor of B class");
    }
}
class C extends B
{
    C()
    {
       System.out.println("Constructor of C class");
    }
}
public class Main
{
        public static void main(String[] args) {
        C obj=new C();
        }
}
```

Method Overriding.

```
import java.util.*;
class A
{
    int a;
    Scanner s=new Scanner(System.in);
    void inputA()
    {
       System.out.println("Please enter A value");
       a=s.nextInt();
    }
    void displaySum()
    {
       System.out.println(" A value is "+a);
    }
}
class B extends A
{
    int b;
    void inputB()
    {
       System.out.println("Please enter B value");
       b=s.nextInt();
    }
    void displaySum()
    {
       System.out.println(" Addition is "+(a+b));
    }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B();
        obj.inputA();
        obj.displaySum();
        obj.inputB();
        obj.displaySum();
        }
```

```
}
class B extends A
{
    int b;
    void inputB()
    {
       System.out.println("Please enter B value");
       b=s.nextInt();
    }
    void displayAplusB()
    {
       System.out.println(" Addition is "+(a+b));
    }
}
class C extends B
{
    int c;
    void inputC()
    {
       System.out.println("Please enter C value");
       c=s.nextInt();
    }
    void displayAddition()
    {
       System.out.println(" Addition is "+(a+b+c));
    }
}
public class Main
{
        public static void main(String[] args) {
        C obj=new C();
        obj.inputA();
        obj.displayA();
        obj.inputB();
        obj.displayAplusB();
        obj.inputC();
        obj.displayAddition();
        }
}
```

Super Keyword

```
import java.util.*;
class A
{
    int a;
    Scanner s=new Scanner(System.in);
    void inputA()
    {
       System.out.println("Please enter A value");
       a=s.nextInt();
    }
    void display()
    {
       System.out.println(" A value is "+a);
    }
}
class B extends A
{
    int b;
    void inputB()
```

```
        obj.inputB();
        obj.displaySum();
        }
}
```

Super keyword for parent class Constructor

```
class A
{
   int a;
   A(int x)
   {
      a=x;
   }
   void display()
   {
      System.out.println(" A value is "+a);
   }
}
class B extends A
{
   int b;
   B(int x,int y)
   {
      super(x);
      b=y;
   }
   void display()
   {
      super.display();
      System.out.println(" Addition is "+(a+b));
   }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B(10,5);
        obj.display();
        }
}
```

final keyword → Method

```
import java.util.*;
class A
{
   int a=3;
   Scanner s=new Scanner(System.in);
   void inputA()
   {
      System.out.println("Please enter A value");
      a=s.nextInt();
   }
   final void display()
   {
      System.out.println(" A value is "+a);
   }
}
class B extends A
{
   int b;
```

```
   int b;
   void inputB()
   {
      System.out.println("Please enter B value");
      b=s.nextInt();
   }
   void display()
   {
      super.display();
      System.out.println(" Addition is "+(a+b));
   }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B();
        obj.inputA();
        obj.inputB();
        obj.display();
        }
}
```

final keyword → variable

```
import java.util.*;
class A
{
   final int a=3;
   Scanner s=new Scanner(System.in);
   void inputA()
   {
      System.out.println("Please enter A value");
      a=s.nextInt();
   }
   void displayA()
   {
      System.out.println(" A value is "+a);
   }
}
class B extends A
{
   int b;
   void inputB()
   {
      System.out.println("Please enter B value");
      b=s.nextInt();
   }
   void displayAplusB()
   {
      System.out.println(" Addition is "+(a+b));
   }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B();
        obj.inputA();
        obj.displayA();
        obj.inputB();
        obj.displayAplusB();
```

```
}
class B extends A
{
   int b;
   void inputB()
   {
      System.out.println("Please enter B value");
      b=s.nextInt();
   }
   void display()
   {
      System.out.println(" Addition is "+(a+b));
   }
}
public class Main
{
        public static void main(String[] args) {
        B obj=new B();
        obj.inputA();
        obj.display();
        obj.inputB();
        obj.display();
        }
}
```

Abstract class-

```
import java.util.*;
abstract class Volume
{
   float r,v;
   Scanner s=new Scanner(System.in);
   void input()
   {
      System.out.println("Pls enter radius");
      r=s.nextFloat();
   }
   void output()
   {
      System.out.println("Volume is "+v);
   }
   abstract void calculate();
}
class Sphere extends Volume
{
   void calculate()
   {
      v=4.0f/3*3.14f*r*r*r;
   }
}
class HemiSphere extends Volume
{
   void calculate()
   {
      v=2.0f/3*3.14f*r*r*r;
   }
}
class HelloWorld {
   public static void main(String[] args) {
      Sphere sp=new Sphere();
      sp.input();
      sp.calculate();
      sp.output();
      HemiSphere hs=new HemiSphere();
      hs.input();
      hs.calculate();
      hs.output();
   }
}
```

final keyword → class.

```
import java.util.*;
class A
{
   int a=3;
   Scanner s=new Scanner(System.in);
   void inputA()
   {
      System.out.println("Please enter A value");
      a=s.nextInt();
   }
   void display()
   {
      System.out.println(" A value is "+a);
   }
}
final class B extends A
{
   int b;
   void inputB()
   {
      System.out.println("Please enter B value");
      b=s.nextInt();
   }
   void display()
   {
      System.out.println(" Addition is "+(a+b));
   }
}
class C extends B
{

}

public class Main
{
        public static void main(String[] args) {
        C obj=new C();
        obj.inputA();
        obj.display();
        obj.inputB();
        obj.display();
        }
}
```

Interface

```
import java.util.*;
interface Volume
{
   void input();
   void calculate();
   void output();
}
class Sphere implements Volume
{
   float r,v;
   Scanner s=new Scanner(System.in);
   public void input()
   {
      System.out.println("Pls enter radius");
      r=s.nextFloat();
   }
   public void output()
   {
      System.out.println("Volume is "+v);
   }
   public void calculate()
   {
      v=4.0f/3*3.14f*r*r*r;
   }
}
class HemiSphere implements Volume
{
   float r,v;
   Scanner s=new Scanner(System.in);
   public void input()
   {
      System.out.println("Pls enter radius");
      r=s.nextFloat();
   }
   public void output()
   {
      System.out.println("Volume is "+v);
   }
   public void calculate()
   {
      v=2.0f/3*3.14f*r*r*r;
   }
}
class HelloWorld {
   public static void main(String[] args) {
      Sphere sp=new Sphere();
      sp.input();
      sp.calculate();
      sp.output();
      HemiSphere hs=new HemiSphere();
      hs.input();
      hs.calculate();
      hs.output();
   }
}
```

```
public static void main(String[] args) {
    Sphere sp=new Sphere();
    sp.input();
    sp.calculate();
    sp.output();
    HemiSphere h=new HemiSphere();
    h.input();
    h.calculate();
    h.output();
    }
}
```

```
{
  void input();
  void calculate();
  void output();
}
class Sphere implements Volume
{
  float r,v;
  Scanner s=new Scanner(System.in);
  public void input()
  {
    System.out.println("Pls enter radius");
    r=s.nextFloat();
  }
  public void output()
  {
    System.out.println("Volume is "+v);
  }
  public void calculate()
  {
    v=4.0f/3*3.14f*r*r*r;
  }
}

class HelloWorld {
  public static void main(String[] args) {
    Sphere sp=new Sphere();
    sp.input();
    sp.calculate();
    sp.output();
    }
}
```

Packages-

Main

```
import java.util.*;
import vol.Cyl;
class Main
{
public static void main(String z[])
{
double r,h;
Scanner s=new Scanner(System.in);
System.out.println("Enter radius and height");
r=s.nextDouble();
h=s.nextDouble();
Cyl c=new Cyl();
System.out.println("The volume is "+c.volume(r,h));
}
}
```

vol

Cyl.class.

⇓

```
package vol;

public class Cyl
{
public double volume(double r,double h)
{
return 3.14*r*r*h;
}
}
```