Q. what is Inheritance and Describe the types of Inheritances.

A: Inheritance:

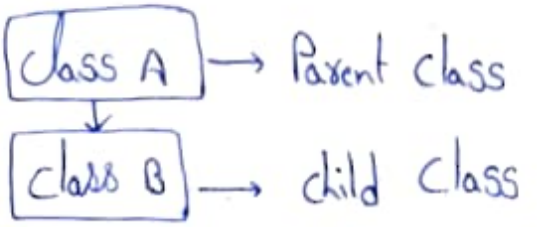
The method to create a hierarchy between classes by Inheriting from other classes.

There are 5 types of Inheritance:

They are:
1) Single Inheritance
2) Multi level Inheritance
3) Multiple Inheritance
4) Hierachial Inheritance
5) Hybrid Inheritance

In this Multiple Inheritance does not supports in Java to overcome we use Interface

1) Single Inheritance. In this we have one Parent class and child class. Both are Interlinked and child class is accessed by the Parent class.



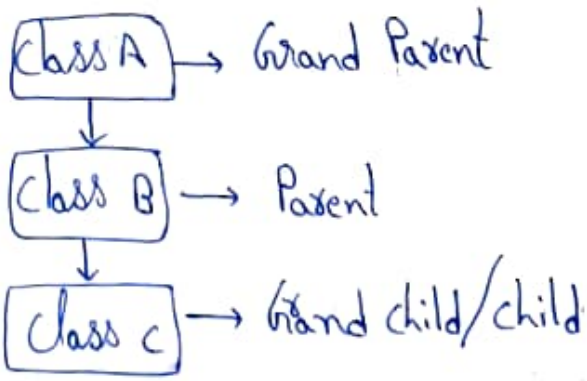
Program.

```
ClassA {
    Public Void dis_a (){
System.out.Println ("Base Class is Derived");
```

```
    }
}
class B extends A{
        Public Void dis_b( ){
        System.out.Println("child class is Created");
    }
}
class Main{
        Public static Void main(String args[]){
          b.obj =new b( );
          obj .dis-a( );
          obj .dis-b( );
    }
}
```

Output: Base class is Derived
child class is Created.

2) multilevel Inheritance. In this we have Grand Parent, Parent and child class where child class becomes Grand child for the Grand Parent class



Program.

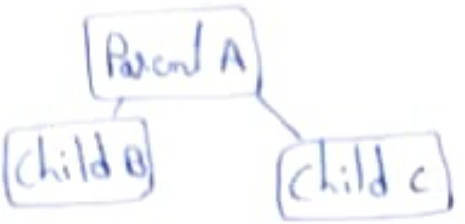
```
class A{
    Public void dis1(){
    System.out.Println("Hi");
  }
}
Class B Extends A {
    Public void dis2(){
    System.out.Println("Hello");
}}
class C Extends B {
    Public void dis3(){
    System.out.Println("world");
}}
class Main {
    Public static void main(String args[]){
        C0 = new();
        0.dis();
        0.dis2();
        0.dis3();
}}
```

output:

Hi
Hello
world.

3) Hierachal Inheritance.

In this Inheritance single Parent class have many child classes as follows



Program.

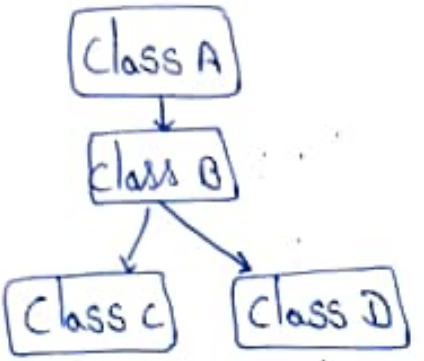
```
class A {
    Public void dis1() {
    System out Println ("Parent class derived");
} }

class B Extends A {
        Public void dis2(){
        System. out Println ("child is derived");
    }
}
class C Extends A {
        Public void dis3(){
    System. out Println ("child 2 is derived");
}
}
class Main {
    Public Static Void main (String args[]){
        b o1 = new b();
        c o2 = new c();
```

```
    o1 dis1();
    o1 dis2();
    o2 dis3();
}}
```

Output. Parent class derived
Child1 is derived
Child2 is derived

6) Hybrid Inheritance.

In this Inheritance is done when combination of 2 Inheritances as follows



Program:

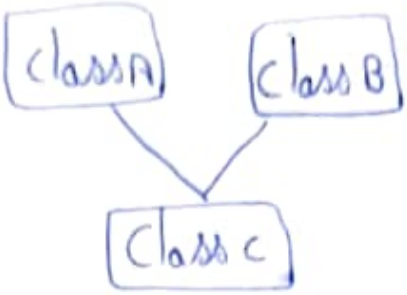
```
Class a{
    Public void dis1(){
    System.out.Println("Hi");
}}
class b Extends a{
    Public void dis2(){
    System.out.Println("Hello");
}}
```

```
class c Extends B {
        Public void dis3(){
        System.out.Println ("Hi!");
} }

class d Extends B {
        Public void dis4 () {
        System.out.Println ("King");
    }
}

Class Main {
        Public Static void main (String args[]){
            C obj c = new c(1);
            d obj d = new d(1);
             obj c.dis1();
             obj c.dis2();
             obj c.dis3();
             obj d.dis1();
             obj d.dis2();
             obj d.dis3();
    }
}
```

output = Hi
Hello
Hi!
Hi!
Hello
King

5) Multiple Inheritance.

In this Inheritance 2 Parent class combines and forms an single child class where in Java it is not Possible for over coming we use Interface.




```
class A {
int a;
A() {
    a = 5;
  }
void dis1() {
    System.out.Println(a);
  }
}
Interface B {
    int b = 10;
    void dis2() {
    System.out.Println(b);
}}
class C extends A implements B {
    int c = 15;
    void dis3() {
    System.out.Println(c);
}}
Public class main {
```

```
    Public static void main (String args[]) {
        c obj = new c ();
        obj dis1();
        obj dis2();
        obj dis3();
    }

lass Main {
    Public static Void main (String args[]){
try {
  int a = 50/0;
  System.out.Println ("there is no Error");
}
Catch (Exception e) {
      System.out.Println (e.getMessage());
}
finally
  {
    System.out.Println ("This is finally Block");
  }
}
```

output

/ by zero
this is the finally Block.