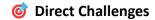
Inheritance



1. Create a base class Animal and a derived class Dog

```
public class Animal {
  void sound() {
    System.out.println("Animal makes a sound");
  }
}
public class Dog extends Animal {
  void bark() {
    System.out.println("Dog barks");
  }
}
public class Main {
  public static void main(String[] args) {
    Dog d = new Dog();
    d.sound(); // from parent
    d.bark(); // from child
  }
}
Output:
Animal makes a sound
```

Dog barks

2. Use super keyword to access parent class constructor

```
public class Animal {
  Animal() {
    System.out.println("Animal constructor called");
  }
}
public class Dog extends Animal {
  Dog() {
    super(); // calls parent constructor
    System.out.println("Dog constructor called");
  }
}
public class Main {
  public static void main(String[] args) {
    Dog d = new Dog();
  }
}
Output:
Animal constructor called
```

Dog constructor called

3. Override a method from parent class in child class

```
public class Animal {
  void sound() {
    System.out.println("Animal makes a sound");
  }
```

```
}
public class Dog extends Animal {
  @Override
  void sound() {
    System.out.println("Dog barks");
  }
}
public class Main {
  public static void main(String[] args) {
    Animal a = new Dog(); // polymorphism
    a.sound(); // overridden method
  }
}
Output:
Dog barks
Scenario-Based Challenges
1. Build a class Vehicle and extend it to Truck, Car, and Bike
public class Vehicle {
  void start() {
    System.out.println("Vehicle started");
  }
}
class Truck extends Vehicle {
```

```
void load() {
    System.out.println("Truck is loading goods");
  }
}
class Car extends Vehicle {
  void drive() {
    System.out.println("Car is driving");
  }
}
class Bike extends Vehicle {
  void ride() {
    System.out.println("Bike is riding");
  }
}
public class Main {
  public static void main(String[] args) {
    Truck t = new Truck();
    t.start();
    t.load();
    Car c = new Car();
    c.start();
    c.drive();
    Bike b = new Bike();
```

```
b.start();
    b.ride();
 }
}
Output:
Vehicle started
Truck is loading goods
Vehicle started
Car is driving
Vehicle started
Bike is riding
2. Create a class Shape with area method and extend it for Circle, Rectangle
public class Shape {
  void area() {
    System.out.println("Calculating area...");
  }
}
class Circle extends Shape {
  double radius;
  Circle(double r) {
    radius = r;
  }
  @Override
  void area() {
```

```
double result = 3.14 * radius * radius;
    System.out.println("Area of Circle: " + result);
  }
}
class Rectangle extends Shape {
  int length, width;
  Rectangle(int I, int w) {
    length = I;
    width = w;
  }
  @Override
  void area() {
    int result = length * width;
    System.out.println("Area of Rectangle: " + result);
  }
}
public class Main {
  public static void main(String[] args) {
    Circle c = new Circle(5);
    c.area();
    Rectangle r = new Rectangle(4, 6);
    r.area();
  }
```

}

Output:

Area of Circle: 78.5

Area of Rectangle: 24