1. Define an abstract class figure. Define the area and volume method in the child classes. Use dynamic method dispatch.

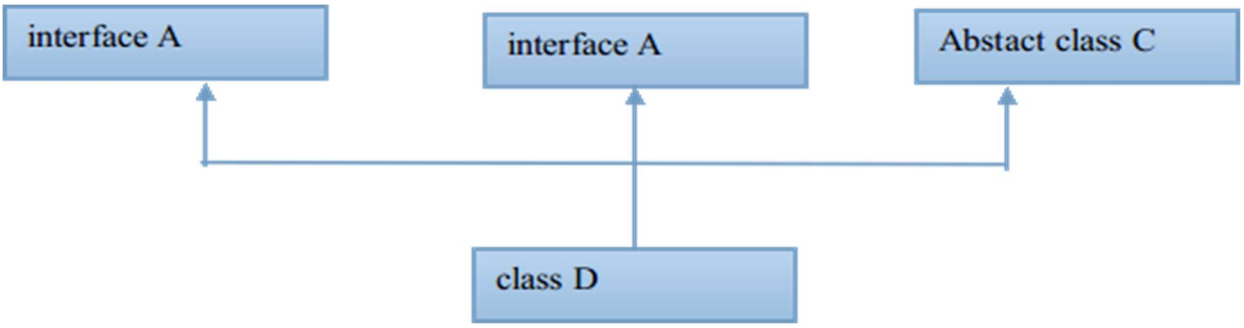
```
import java.util.*;
abstract class figure{
  abstract void area(int a);
  abstract void volume(int a);
  public void display() {
   System.out.println("Parent class");
  }
}
class Cube extends figure {
    public void area(int a) {
      System.out.println("Area of Cube: "+ 6*a*a);
    }
    public void volume(int a) {
      System.out.println("Volume of Cube: "+ a*a*a);
    }
}
class Sphere extends figure {
      public void area(int a) {
        System.out.println("Area of Sphere: "+ 4*3.14*a*a);
      }
      public void volume(int a) {
        System.out.println("Volume of Sphere: "+ (4/3)*3.14*a*a*a);
      }
}
class shape {
    public static void main(String[]args){
Cube c=new Cube();
Sphere s=new Sphere();
Scanner sc= new Scanner(System.in);
System.out.print("Enter edge of cube: ");
int edge= sc.nextInt();
System.out.print("Enter radius of sphere: ");
int sphere= sc.nextInt();
c.area(edge);
c.volume(edge);
c.display();
s.area(sphere);
```

```
s.volume(sphere);
s.display();
sc.close();
}
}
```

Output:

```
Enter edge of cube: 4
Enter radius of sphere: 6
Area of Cube: 96
Volume of Cube: 64
Parent class
Area of Sphere:452.15999999999997
Volume of Sphere: 678.24
Parent class
```

Implement the following design with suitable example classes.



Interface A = apple
Interface A1 = android
Abstract class C = phone
Class D = device

Code:

```
interface Apple {
   void dispAppleCam();
   void dispAppleOs();
}

interface Android {
   void dispAndOs();
   void dispAndCam();
}
```

```
abstract class Phone {
   abstract void displayScreenSize();

   void displayMaterial() {
       System.out.println("metallic body with glass back and molded
display");
   }
}

class Device extends Phone implements Android, Apple {
   public void dispAppleCam() {
       System.out.println("12 megapixels");
   }

   public void dispAppleOs() {
       System.out.println("iOS 16.6");
   }

   public void dispAndOs() {
       System.out.println("Android 13");
   }

   public void dispAndCam() {
       System.out.println("500 megapixels");
   }

   public void displayScreenSize() {
       System.out.println("7 inches");
   }
}

public class iface {
   public static void main(String[] args) {
       Device obj = new Device();
       System.out.println("Apple phone");
       obj.dispAppleOs();
       obj.dispAppleCam();
       obj.displayScreenSize();
       System.out.println(" ");
```

```
        System.out.println("Android phone");
        obj.dispAndOs();
        obj.dispAndCam();
        obj.displayScreenSize();
    }
}
```

Output:

```
Apple phone
iOS 16.6
12 megapixels
7 inches

Android phone
Android 13
500 megapixels
7 inches
linuxmint@jc610:~/ritabrata-java/pack$
```