2.1 Create an abstract class Figure with following properties and functions:

Properties: double dim1;

Methods: abstract void findArea();

abstract void findPerimeter();

Create three subclasses Circle, Rectangle and Triangle that extends Figure class and define both the methods.

Write a program that will find the area and perimeter of 3 Figures and print the details for all.

2.2 Code with Comments

Figure Abstract Class

```
package assignments;

public abstract class Figure {
	public double dim1;


	public abstract void findArea();

	public abstract void findPerimeter();
}
```

Circle Class

```
package assignments;

import java.util.Scanner;

public class Circle extends Figure{

	double pi=3.14;


	@Override
	public void findArea() {
		Scanner scan=new Scanner(System.in);

		System.out.println("Enter the radius of the circle");
		int r=scan.nextInt();
		dim1= pi*r*r;
		System.out.println("Area of the circle = " + dim1);
```

```
	}

	@Override
	public void findPerimeter() {
		Scanner scan=new Scanner(System.in);
		System.out.println("Enter the radius of the circle");
		int r=scan.nextInt();
		dim1=2*pi*r;
		System.out.println("Perimeter of the circle =" + dim1);

	}

}
```

Rectangle Class

```
package assignments;

import java.util.Scanner;

public class Rectangle extends Figure {


	@Override
	public void findArea() {
		   Scanner scanner = new Scanner(System.in);
		   System.out.println(" Enter the length of Rectangle: ");
		   double length = scanner.nextDouble();
		   System.out.println("Enter the width of Rectangle:");
		  double width = scanner.nextDouble();
		   dim1 = length*width; //area=l*b
		   System.out.println("Area of Rectangle is:"+dim1);

	}

	@Override
	public void findPerimeter() {
		Scanner scanner = new Scanner(System.in);
		   System.out.println(" Enter the length of Rectangle: ");
		   double length = scanner.nextDouble();
		   System.out.println("Enter the width of Rectangle:");
		  double width = scanner.nextDouble();
		dim1 =2*(length+width); //2*(l+b)
		System.out.println("Perimeter of Rectangle is:"+dim1);
	}



}
```

Triangle Class

```
package assignments;

import java.util.Scanner;
```

```
public class Triangle extends Figure {

	@Override
	public void findArea() {

		Scanner scan = new Scanner(System.in);
		 System.out.println("Enter the width of the Triangle:");
		double base = scan.nextDouble();

		System.out.println("Enter the height of the Triangle:");
		double height = scan.nextDouble();

		//Area = (width*height)/2
		dim1 = (base* height)/2;
		System.out.println("Area of Triangle is: " + dim1);
	}

	@Override
	public void findPerimeter() {
		Scanner scan = new Scanner(System.in);
		System.out.println("Enter the sides of the triangle");
		float a=scan.nextFloat();
		float b=scan.nextFloat();
		float c=scan.nextFloat();
		dim1=a+b+c;
		System.out.println("Perimeter of Triangle is: "+dim1);

	}


}
```

Main Class

```
package assignments;

public class FigureMainClass {

	public static void main(String[] args) {

		Circle c=new Circle();
		Rectangle r=new Rectangle();
		Triangle t=new Triangle();
		c.findArea();
		c.findPerimeter();
		r.findArea();
		r.findPerimeter();
		t.findArea();
		t.findPerimeter();


	}

}
```

2.3 Explanation of the code

I created one abstract class with abstract method and one property and I created 3 subclasses as Circle, Rectangle and Triangle. Added all the unimplemented methods and calculated the area and perimeter of the circle, triangle and rectangle. I created a new class with main function and created an object for all the classes and called all the methods and got the output.

2.4 Output