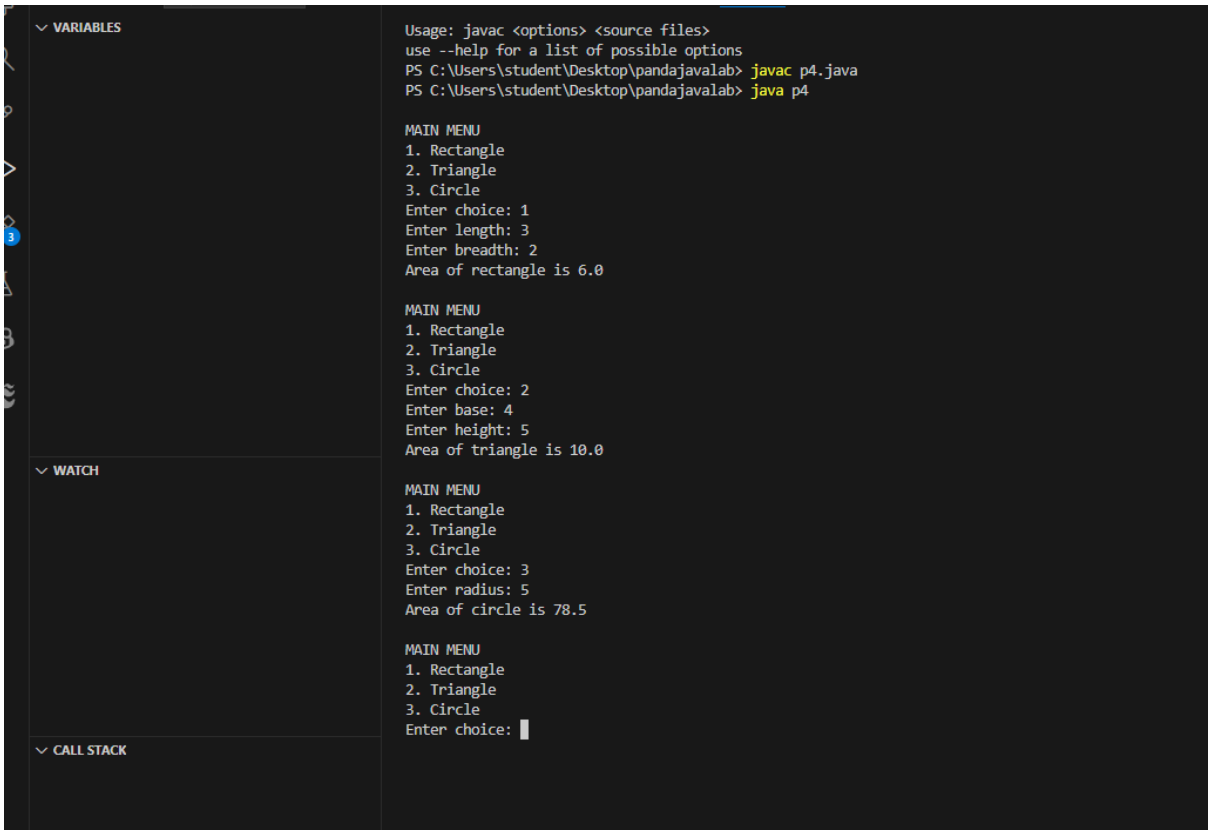
Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea( ). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

```
import java.util.Scanner;

abstract class Shape {
   double a, b;
   abstract void printArea();
}

class Rectangle extends Shape {
   void printArea() {
      System.out.println("Area of rectangle is " + (a * b));
   }
}

class Triangle extends Shape {
   void printArea() {
      System.out.println("Area of triangle is " + (0.5 * a * b));
   }
}

class Circle extends Shape {
   void printArea() {
      System.out.println("Area of circle is " + (3.14 * a * a));
   }
}
class p4 {
   public static void main(String args[]) {
      int n;
      Rectangle r = new Rectangle();
      Triangle t = new Triangle();
      Circle c = new Circle();
      Scanner s1 = new Scanner(System.in);

      while (true) {
         System.out.println("\nMAIN MENU");
         System.out.println("1. Rectangle");
```

```
        System.out.println("2. Triangle");
        System.out.println("3. Circle");
        System.out.print("Enter choice: ");
        n = s1.nextInt();

        switch (n) {
          case 1:
            System.out.print("Enter length: ");
            r.a = s1.nextDouble();
            System.out.print("Enter breadth: ");
            r.b = s1.nextDouble();
            r.printArea();
            break;

          case 2:
            System.out.print("Enter base: ");
            t.a = s1.nextDouble();
            System.out.print("Enter height: ");
            t.b = s1.nextDouble();
            t.printArea();
            break;

          case 3:
            System.out.print("Enter radius: ");
            c.a = s1.nextDouble();
            c.printArea();
            break;

          default:
            System.out.println("Invalid input");
        }
      }
    }
}
```

OUTPUT:-



Program 3:-

```
import java.util.Scanner;

class Book {
    String name;
    String author;
    double price;
    int numPages;

    Book(String name, String author, double price, int numPages) {
        this.name = name;
        this.author = author;
        this.price = price;
        this.numPages = numPages;
    }

    void setDetails(Scanner scanner) {
        scanner.nextLine();
```

```
        System.out.print("Enter book name: ");
        this.name = scanner.nextLine();

        System.out.print("Enter author name: ");
        this.author = scanner.nextLine();

        System.out.print("Enter price: ");
        this.price = scanner.nextDouble();

        System.out.print("Enter number of pages: ");
        this.numPages = scanner.nextInt();
    }

    void getDetails() {
        System.out.printf("Book Name: %s\n", name);
        System.out.printf("Author: %s\n", author);
        System.out.printf("Price: Rs%.2f\n", price);
        System.out.printf("Number of Pages: %d\n", numPages);
    }


    public String toString() {
        return String.format("Book Details:\nName: %s\nAuthor: %s\nPrice: Rs%.2f\nNumber
of Pages: %d",
                        name, author, price, numPages);
    }
}

public class Books {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of books: ");
        int n = scanner.nextInt();

        Book[] books = new Book[n];

        for (int i = 0; i < n; i++) {
            System.out.println("\nEnter details for Book " + (i + 1) + ":");
            books[i] = new Book("", "", 0.0, 0);
            books[i].setDetails(scanner);
```

```
        }

        System.out.println("\nDetails of all books:");
        for (int i = 0; i < n; i++) {
            System.out.println("\nBook " + (i + 1) + ":");
            books[i].getDetails();
        }

        System.out.println("\nComplete details of all books (using toString):");
        for (int i = 0; i < n; i++) {
            System.out.println("\nBook " + (i + 1) + ":\n" + books[i]);
        }

        scanner.close();
    }
}
```

OUTPUT:-