LAB-Program-4

Develop a Java program to create an abstract class named Shape that contain two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that the 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.

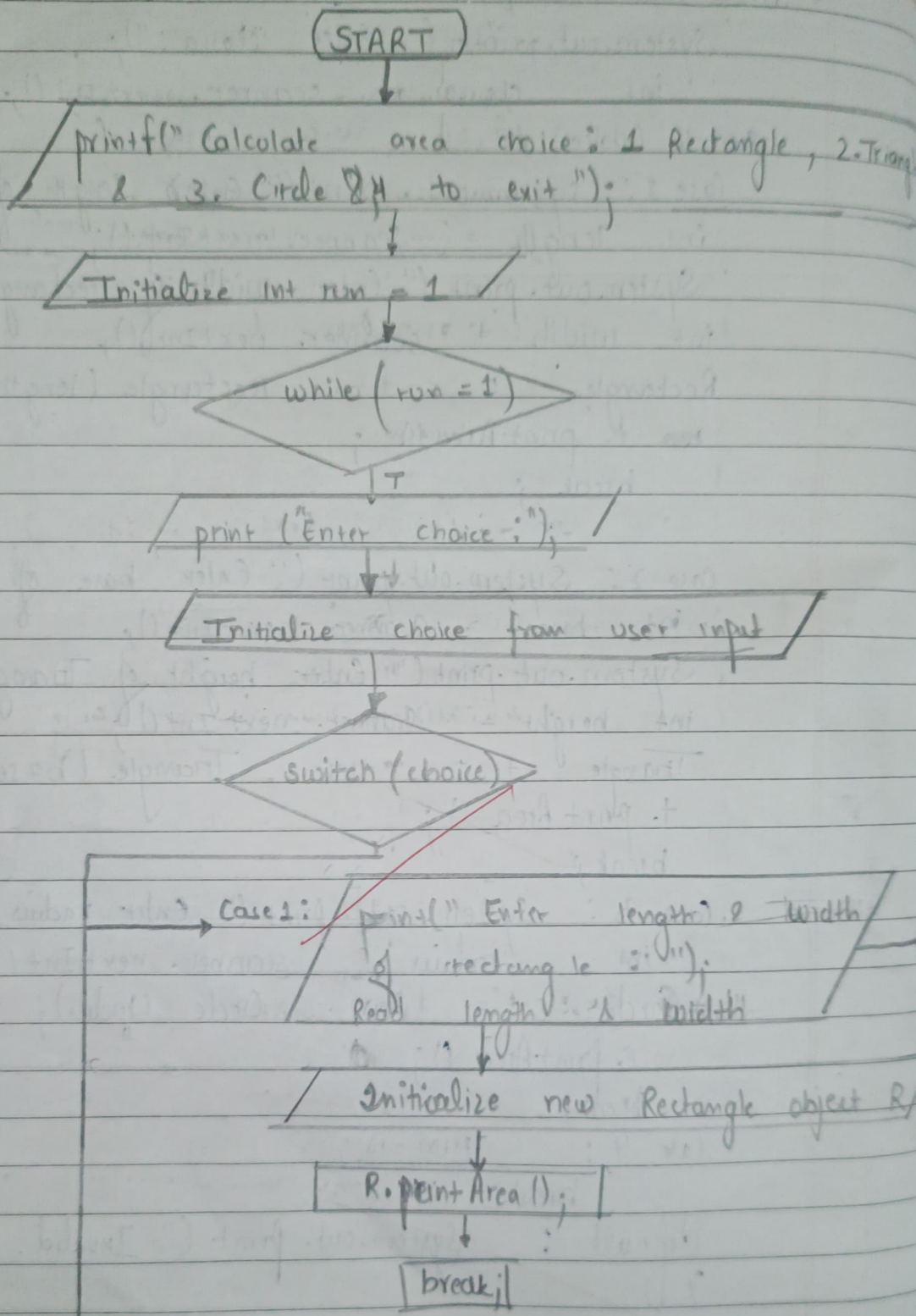
```
import java.util.Scanner;

abstract class Shape{
    int dimension1;
    int dimension2;
    public abstract void printArea();
}
class Rectangle extends Shape{
    public Rectangle(int length1, int width1){
        this.dimension1 = length;
        this.dimension2 = width;
    }
    @Override
    public void printArea(){
        int area = dimension1 * dimension2;
        System.out.println("Area of Rectangle: " +
        area);
    }
}
```

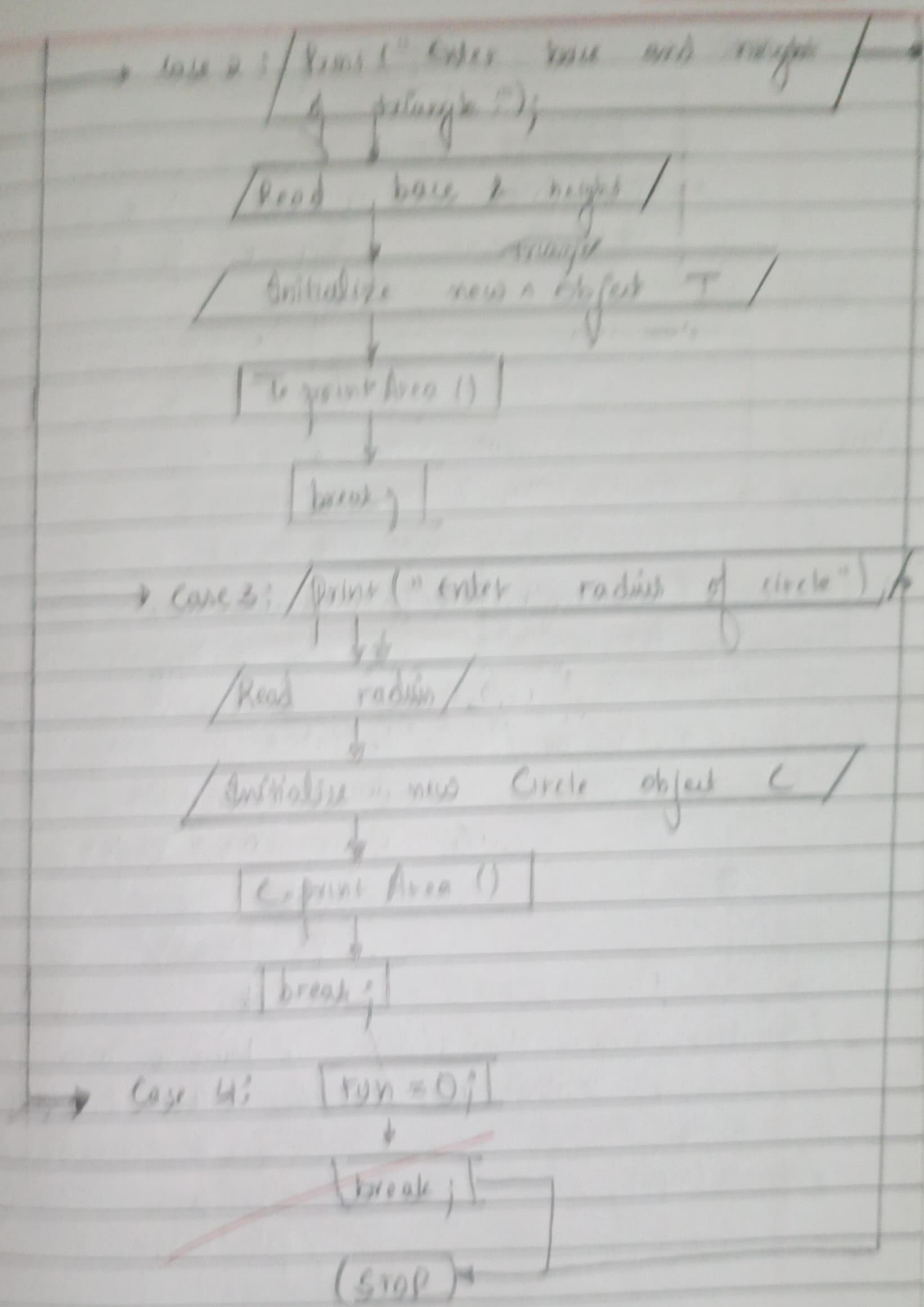
Annotations

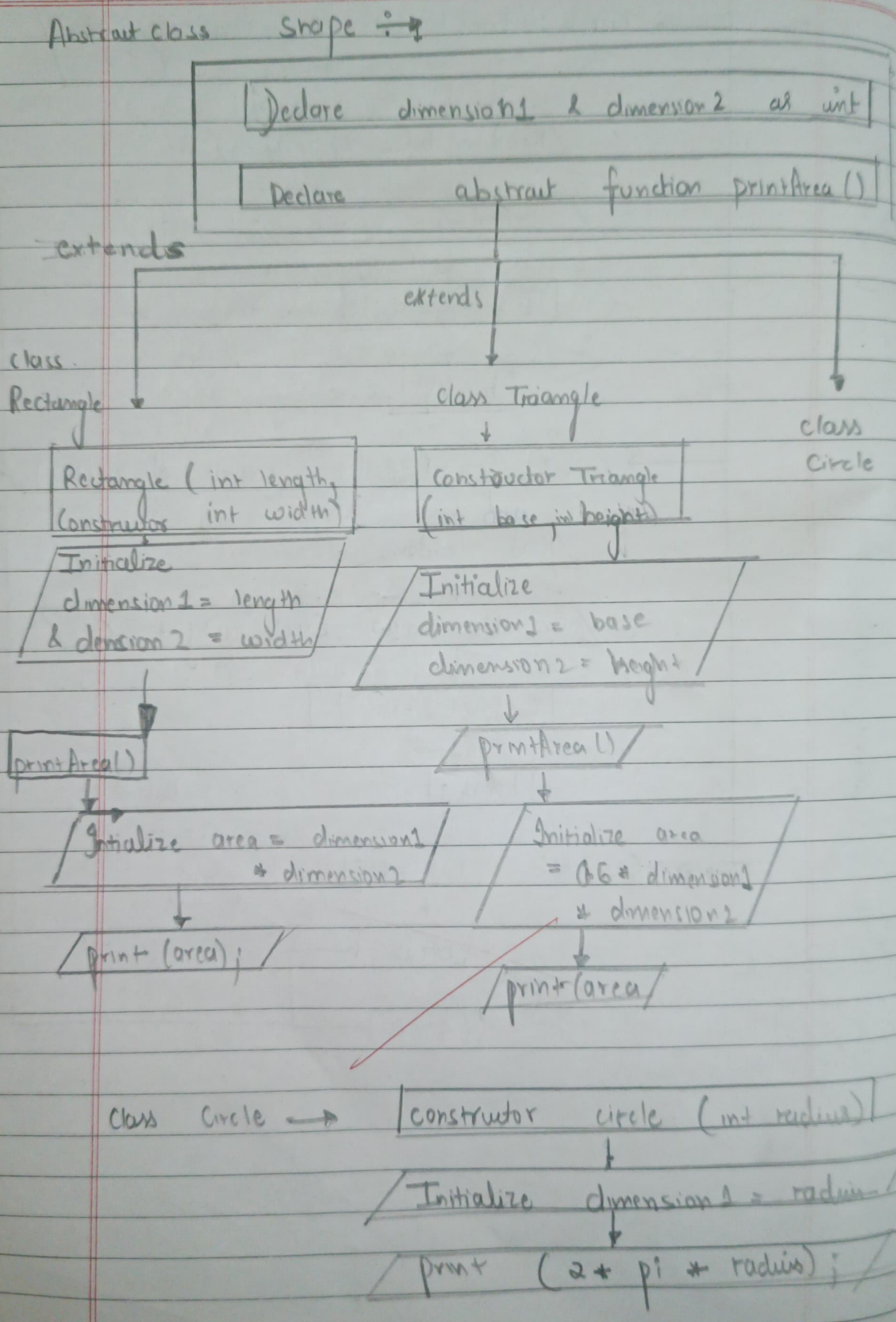
```
class Triangle extends Shape {
    public Triangle (int base, int height) {
        this.dimension1 = base;
        this.dimension2 = height;
    }

    @Override
    public void printArea () {
        int area = 0.5 * dimension1 * dimension2;
        System.out.println ("Area of Triangle : " + area);
    }
}

class Circle extends Shape {
    public Circle (int radius) {
        this.dimension1 = radius;
    }
    @Override
    public void printArea () {
        int area = Math.PI * dimension1 *
        dimension1;
        System.out.println ("Area of Circle :" + area);
    }
}

public class Main {
    public static void main (String [] args) {
        Scanner scanner = new Scanner (System.in);
        System.out.println ("Choose a shape to
Calculate area In 1. Rectangle In 2. Triangle In
3. Circle & In 4. Exit.");

        int run = 1
```

```
while (run == 1) {
    System.out.println(" Enter choice :");
    int choice = scanner.nextInt();
switch (choice) {
    Case 1: System.out.print(" Enter length of rectangle:");
    int length = Scanner.nextInt();
    System.out.print(" Enter width of rectangle :");
    int width = scanner.nextInt();
    Rectangle r = new Rectangle (length, width);
    r.printArea();
    break;

    case 2: System.out.print(" Enter base of Triangle :");
    int base = Scanner.nextInt();
    System.out.print(" Enter height of Triangle. :");
    int height = Scanner.nextInt();
    Triangle t = new Triangle (base, height);
    t.printArea();
    break;
    Case 3: System.out.print(" Enter radius of circle:");
    int radius = scanner.nextInt();
    Circle c = new Circle (radius);
    c.printArea();
    break;
    Case 4: run = 0;
        break;
    default : System.out.print(" Invalid Choice");
    }
}
scanner.close();
}
}
```

Main class :->


START
printf(" Calculate area choice : 1 Rectangle , 2. Triang
& 3. Circle &4 to exit ");
Initialize int run = 1
while (run = 1)
T
print ("Enter choice :");
Initialize choice from user input
switch (choice)
Case 1:
print(" Enter length & width
of rectangle :");
Read length & width
Initialize new Rectangle object R
R.printArea ();
break;


case 2: Print("Enter base and height of triangle");
Read base & height
Initialize new object T
T.printArea()
break;
case 3: Print("enter radius of circle");
Read radius
Initialize new Circle object C
C.printArea()
break;
case 4: run=0;
break;
Stop


Abstract class Shape
Declare dimension1 & dimension2 as int
Declare abstract function printArea()
extends
extends
class Rectangle
class Triangle
class Circle
Rectangle (int length, int width)
Constructor
Initialize dimension1 = length & dimension2 = width
printArea()
Initialize area = dimension1 * dimension2
print (area);
Constructor Triangle (int base, int height)
Initialize dimension1 = base dimension2 = height
printArea()
Initialize area = 0.5 * dimension1 * dimension2
print (area
Class Circle
constructor circle (int radius)
Initialize dimension1 = radius
print (2 * pi * radius);

LAB 3 - Output :- Enter the number of books to create : 2
~~Name : Ko~~
Enter the details for Book 1 :
Name : Kafka on the shore
Author : Haruki Murakami
Price : 289
Number : 504

Enter details for Book 2 :
Name : Dark Matter
Author : Blake Crouch
Price : 320
Number : 400

Details of the Books :

Book 1 :
Book : kafka on the shore by author Haruki Murakami with pages 504 is of price 289.0

Book 2 :
Book : Dark Matter by author Blake Crouch with pages 400 is of price 320.0 .

LAB - 4:

Choose shape to Calculate Area : 1. Rectangle
2. Triangle 3. Circle 4. Exit .

Enter Choice : 1
Enter length of Rectangle : 10
Enter width of Rectangle : 5
Area : 50
Enter Choice : 2
Enter base of Triangle : 2
Enter height : 1
Area : 1
Enter choice : 3
radius : 2
area = 12.566
Enter Choice : 4

18/01/24