

LAB - 4

3. Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString() method that could display the complete details of the book. Develop a Java program to create n book objects.

→ import java.util.Scanner;
class Book {

String name, author;

int price, numPages;

Book(String name, String author,
int price, int numPages) {

this.name = name;

this.author = author;

this.price = price;

this.numPages = numPages;

}

public String toString() {

String name, author, price,
numPages;

name = "Book name: " +

this.name + "\n";

author = "Author name: " +

this.author + "\n";

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```

        price = "Price: " + this.price +
                "\n";
        numPages = "Number of pages: " +
                this.numPages + "\n";
        return name + author + price +
                numPages;
    }
}

```

```

class Run {

```

```

    public static void main (String
                                args []) {

```

```

        Scanner s = new Scanner
                        (System.in);

```

```

        int n, price, numPages;

```

```

        String name, author;

```

```

        System.out.println("Enter number
                            of details.");

```

```

        n = s.nextInt();

```

```

        Book b[] = new Book[n];

```

```

        for (int i = 0; i < n; i++) {

```

```

            System.out.println("
                                Enter details of "
                                + (i+1) + ": ");

```

```

            System.out.println
                ("Enter
                 name:");

```

```

            name = s.next();

```

```

            System.out.println
                ("Enter
                 author:");

```

```

            author = s.next();

```

```

            System.out.println
                ("Enter price:");

```

```

price = s.nextInt();
System.out.println("Enter
number of pages:");
numPages = s.nextInt();
b[i] = new Book(name, author,
price, numPages);
}
System.out.println();
for (int i = 0; i < n; i++) {
    System.out.println(
        "Record " + (i+1) +
        " :\n" +
        b[i].toString());
}
}
}
}

```

Output:

Enter number of details: 1
 Enter details of 1: Book
 Enter name: Maths
 Enter author: RSA
 Enter price: 120
 Enter number of pages: 110

Record 1:

Book name: Maths

Author name: RSA

Price: 120

Number of pages: 110

4. 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.

```

→ import java.util.Scanner;
abstract class Shape {
    double dim1, dim2;
    Shape(double x, double y) {
        dim1 = x;
        dim2 = y;
    }
    abstract double printArea();
}

class Rectangle extends Shape {
    Rectangle(Double a, Double b) {
        super(a, b);
    }
    double printArea() {
        System.out.println
            ("Area of rectangle
            : ");
        return dim1 * dim2;
    }
}

class Triangle extends Shape {
    Triangle(Double a, Double b) {
        super(a, b);
    }
}

```

```

double printArea() {
    System.out.println
        ("Area of
         triangle: ");
    return 0.5 * dim1 *
        dim2;
}

```

```

class Circle extends Shape {
    Circle(double a) {
        super(a, 1);
    }
    double printArea() {
        System.out.println
            ("Area of
             circle: ");
        return
            3.14 * dim1 *
            dim1;
    }
}

```

```

class neek {
    public static void main(String
        args[]) {
        double dim1, dim2;
        System
        Scanner s = new Scanner
            (System.in);
        System.out.println
            ("Enter dimensions
             of rectangle
             (length and
             breadth): ");
    }
}

```



```

dim1 = s.nextInt()
dim2 = s.nextInt();
Rectangle r = new Rectangle
(dim1, dim2);
System.out.println("Enter
dimensions of
triangle (base and
height): ");

dim1 = s.nextInt()
dim2 = s.nextInt();
Triangle t = new Triangle
(dim1, dim2);
System.out.println("Enter
dimensions of
circle (radius): ");

dim1 = s.nextInt();
Circle c = new Circle(dim1);
System.out.println(r.print
Area());
System.out.println(t.printArea());
System.out.println(c.printArea());
}
}

```

Output :

Enter dimensions of rectangle (length and breadth):

2 3

Enter dimensions of triangle (base and height):

2 4

Enter dimensions of circle (radius):

3

Area of rectangle: 6.0

Area of triangle: 4.0

Area of circle: 28.2599998

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