Experiment 7

Write a java program which use try and catch for exception handling.

```java
package exceptionhandlingdemo;

import java.util.Scanner;
import java.io.*;

public class Main {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        System.out.println("0.Exit \n1. Arithmetic Exception \n2. Null Pointer Exception \n3. Array index out of bound Exception \n4. File

        int option = 1;
        do {
            System.out.print("Enter Your Choice : ");
            int choice = in.nextInt();

            switch (choice) {
                case 0:
                    System.out.println("Exit");
                    System.exit(0);
                    break;

                case 1:
                    // ArithmeticException
                    int a, b, c;
                    System.out.print("Enter value of a : ");
                    a = in.nextInt();
                    System.out.print("Enter value of b : ");
                    b = in.nextInt();
                    System.out.print("Enter value of c : ");
                    c = in.nextInt();
                    try {
                        if (a == 0) {
                            throw new ArithmeticException("You can not divide by zero");
                        } else {
                            double determinant = (b * b) - (4 * a * c);
                            if (determinant > 0) {
                                double root1 = Math.abs((-b + Math.sqrt(determinant)) / (2 * a));
                                double root2 = Math.abs((-b - Math.sqrt(determinant)) / (2 * a));
                                System.out.println("The Roots Are : " + (float) root1 + " & " + (float) root2);
                            } else if (determinant == 0) {
                                double root = Math.abs((-b + Math.sqrt(determinant)) / (2 * a));
                                System.out.println("The Root is : " + root);
                            } else {
                                throw new ArithmeticException("Determinant can not be negative");
                            }
                        }
                    } catch (ArithmeticException e) {
                        System.out.println(e);
                    }
                    break;

                case 2:
                    // Null Pointer Exception
                    String s = null;
                    try {
                        char c1 = s.charAt(2);
                        System.out.println("Char at index 3 is : " + c1);
                    } catch (Exception e) {
                        System.out.println("String Does not exist \n" + e);
                    }
                    break;

                case 3:
                    // Array index out of bound Exception
                    int arr[] = {0, 1, 2, 3};
                    try {
                        System.out.println(arr[7]);
                    } catch (Exception e) {
                        System.out.println("Req Array index is not available. " + e);
                    }
                    break;

                case 4:
                    // FileNotFoundException
                    try {
```

```java
                    FileInputStream f = new FileInputStream("C:\\Users\\DELL\\Desktop\\3rd Year Sem1\\CalculatorAssign2.class");
                    DataInputStream n = new DataInputStream(f);
                    System.out.println("File is found");
                } catch (FileNotFoundException fn) {
                    System.out.println("File is not found " + fn);
                }
                break;

            case 5:
                // User Define Exception
                System.out.print("Enter value of x : \t");
                double x = in.nextDouble();
                System.out.print("Enter value of y : \t");
                double y = in.nextDouble();
                System.out.print("Enter value of r : \t");
                double r = in.nextDouble();
                try {
                    Circle cr1 = new Circle(x, y, r);
                    System.out.println("Circle created successfully!");
                } catch (InvalidRadiusException e) {
                    e.printError();
                }
                break;

            case 6:
                // Number formatting
                try {
                    String s1 = "Virat";
                    String s2 = "12345";
                    int x1 = Integer.parseInt(s1); // Correct Integer class usage
                    System.out.println("Integer number is " + x1);
                } catch (NumberFormatException e) {
                    System.out.println(e + " is not an integer");
                }
                break;

            case 7:
                // Multiple try catch
                int arr1[] = {10, 20, 30, 40};
                try {
                    arr1[7] = 85;
                    System.out.println("Required Array index is available");
                } catch (ArrayIndexOutOfBoundsException ai2) {
                    System.out.println(ai2);
                } catch (Exception ai1) {
                    System.out.println(ai1);
                }
                break;

            default:
                System.out.println("Invalid Choice");
                break;
        }

        System.out.print("Enter : 1 = Continue , 0 = Stop : ");
        option = in.nextInt();
    } while (option == 1);
  }
}
```

Output:

```
0.Exit
1. Arithmetic Exception
2. Null Pointer Exception
3. Array index out of bound Exception
4. File Exception
5. User Define Exception
6. Number formatting
7. Multiple try catch
Enter Your Choice : 1
Enter value of a : 2
Enter value of b : 4
Enter value of c : 5
java.lang.ArithmeticException: Determinant can not be negative
Enter : 1 = Continue , 0 = Stop : 1
Enter Your Choice : 2
String Does not exist
java.lang.NullPointerException: Cannot invoke "String.charAt(int)" because "s" is null
Enter : 1 = Continue , 0 = Stop : 1
```

```
Enter Your Choice : 3
Req Array index is not available. java.lang.ArrayIndexOutOfBoundsException: Index 7 out of bounds for length 4
Enter : 1 = Continue , 0 = Stop : 1
Enter Your Choice : 4
File is not found java.io.FileNotFoundException: C:\Users\DELL\Desktop\3rd Year Sem1\CalculatorAssign2.class (The system cannot find the pa
Enter : 1 = Continue , 0 = Stop : 1
Enter Your Choice : 5
Enter value of x :  1
Enter value of y :  5
Enter value of r :  6
Circle created successfully!
Enter : 1 = Continue , 0 = Stop : 1
Enter Your Choice : 6
java.lang.NumberFormatException: For input string: "Virat" is not an integer
Enter : 1 = Continue , 0 = Stop : 1
Enter Your Choice : 7
java.lang.ArrayIndexOutOfBoundsException: Index 7 out of bounds for length 4
Enter : 1 = Continue , 0 = Stop : 0
```