<u>Assignment -4</u>

Subject	OOP
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Problem Statement:

Write a program for following exception; develop a suitable scenario in which the following exceptions occur:

        a. divide by zero
        b. Array index out of bounds exception
        c. Null pointer Exception

Develop a menu driven program for handle the above listed exception.

Sample Input and Output

Sample Input/Parameter	Expected Output
Try to divide a number by zero	You shouldn't divide a number by zero.
Try to access the array index which does not exist.	OOPs!!!Array Index 7 out of bounds for length 6.
Try to find the length of String in method (pass parameter string as null)	Null Pointer Exception arises!!

Expected Output:

PS D:\java> cd "d:\java\" ; if ($?) { javac Assign4.java } ; if ($?) { java Assign4 }
MENU :
1.Divide
2.Access array element
3.find length of a string
Enter Choice :1
Enter numerator: 15
Enter denominator: 0
You shouldn?t divide a number by zero.
Press 1 to continue : 1
MENU :
1.Divide
2.Access array element
3.find length of a string
Enter Choice :2
Enter the size of an array: 3
Enter element no. 1: 1
Enter element no. 2: 2
Enter element no. 3: 3
Enter the element no. you want to access: 4
OOPs!!! Array Index 4 out of bounds for length 3
Press 1 to continue : 1
MENU :
1.Divide
2.Access array element
3.find length of a string

Enter Choice :3
Enter string for which you want to find length:
Null Pointer Exception arises!!
Press 1 to continue : 0
PS D:\java>

Input:

```java
import java.util.Scanner;

public class ExceptionHandling {

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

        int choice = 0;
        do {
            System.out.println("MENU :");
            System.out.println("1.Divide");
            System.out.println("2.Access array element");
            System.out.println("3.Find length of a string");
            System.out.print("Enter Choice :");
            choice = scanner.nextInt();
            switch (choice) {
                case 1:
                    System.out.print("Enter numerator: ");
                    int numerator = scanner.nextInt();
                    System.out.print("Enter denominator: ");
                    int denominator = scanner.nextInt();
                    handleArithmeticException(numerator, denominator);
                    break;
                case 2:
                    System.out.print("Enter the size of an array: ");
                    int size = scanner.nextInt();
                    int[] arr = new int[size];
                    for (int i = 0; i < size; i++) {
                        System.out.print("Enter element no. " + (i + 1) +
": ");
                        arr[i] = scanner.nextInt();
                    }
                    System.out.print("Enter the element no. you want to
access: ");
                    int index = scanner.nextInt();
                    handleArrayIndexOutOfBoundsException(arr, index);
                    break;
                case 3:
                    System.out.print("Enter string for which you want to
find length: ");
                    String str = scanner.nextLine().trim();
                    handleNullPointerException(str);
                    break;
                default:
                    System.out.println("Invalid Choice!");
            }
            System.out.print("Press 1 to continue : ");
            choice = scanner.nextInt();
            scanner.nextLine();
```
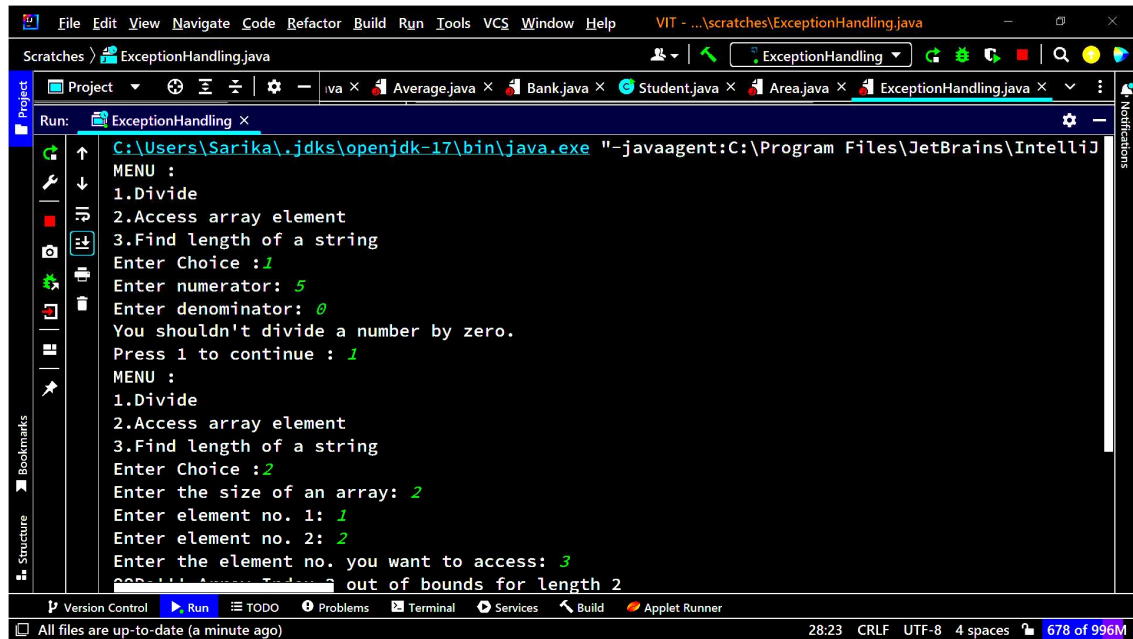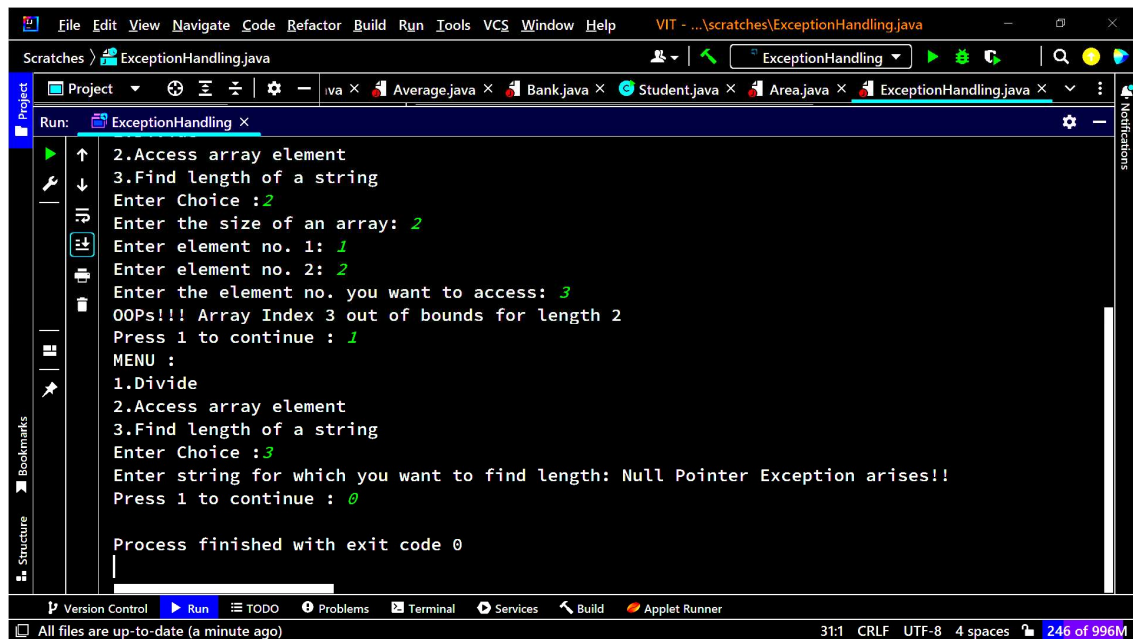
```java
        } while (choice == 1);

        scanner.close();
    }

    private static void handleArithmeticException(int numerator, int
denominator) {
        try {
            int result = numerator / denominator;
            System.out.println("Result: " + result);
        } catch (ArithmeticException e) {
            System.out.println("You shouldn't divide a number by zero.");
        }
    }

    private static void handleArrayIndexOutOfBoundsException(int[] arr, int
index) {
        try {
            int element = arr[index];
            System.out.println("Element: " + element);
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("OOPs!!! Array Index " + index + " out of
bounds for length " + arr.length);
        }
    }

    private static void handleNullPointerException(String str) {
        try {
            if (str == null || str.trim().isEmpty()) {
                throw new NullPointerException();
            }
            int length = str.length();
            System.out.println("Length: " + length);
        } catch (NullPointerException e) {
            System.out.println("Null Pointer Exception arises!!");
        }
    }
}
```