Experiment Number : 12 **Date:**

Implementation of exception handling in Java

Aim:

Write a java program to implement exception handling.

PRE LAB EXERCISE

QUESTIONS

1. What is exception handling in Java?

Exception handling in Java is a mechanism used to handle runtime errors so that the normal flow of the program is not interrupted.

An **exception** is an unexpected event that occurs during program execution, such as:

- Dividing a number by zero
- Accessing an invalid array index
- Trying to open a file that does not exist

In Java, exceptions are handled using keywords like:

- try
- catch
- finally
- throw
- throws

All exception classes are part of the java.lang package and are derived from the class **Exception**.

2. What is the purpose of using try-catch blocks in exception handling?

The **purpose of try-catch blocks** is to:

Prevent Program Crash

If an error occurs, the program does not stop suddenly.

Handle Errors Gracefully

You can display a meaningful message instead of a system error.

Maintain Normal Program Flow

After handling the exception, the program continues execution.

IN LAB EXERCISE

Objective

To understand and implement exception handling through try-catch and finally blocks.

Source Code

```
import java.util.InputMismatchException;
import java.util.Scanner;
public class ExceptionHandlingExample {
 public static void main(String[] args) {
            Scanner scanner = new Scanner(System.in);
             try {
            System.out.print("Enter an integer: ");
            int num = scanner.nextInt();
             int result = 10 / num;
```

```
        System.out.println("Result: " + result);
        } catch (InputMismatchException e) {
        System.out.println("Invalid input! Please enter an integer.");
        } catch (ArithmeticException e) {
        System.out.println("Cannot divide by zero!");
        } finally {
        scanner.close();
        System.out.println("Program execution completed.");
        } }
}
```

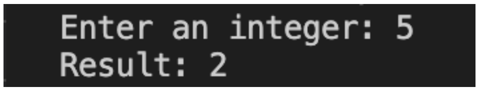
Outputs

Output 1 (Valid Input - Non-zero Integer):

```
Enter an integer: 5

Result: 2

Program execution completed.
```



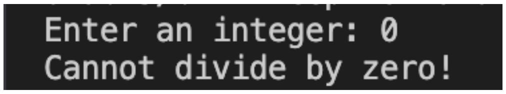
```
Enter an integer: 5
Result: 2
```

Output 2 (Valid Input - Zero):

```
Enter an integer: 0

Cannot divide by zero!

Program execution completed.
```



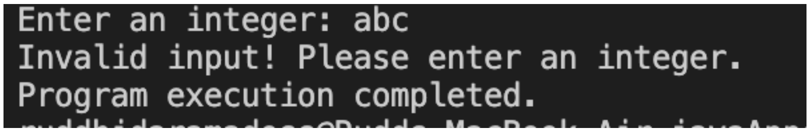
```
Enter an integer: 0
Cannot divide by zero!
```

Output 3 (Invalid Input - Non-integer):

```
Enter an integer: abc

Invalid input! Please enter an integer.

Program execution completed.
```



```
Enter an integer: abc
Invalid input! Please enter an integer.
Program execution completed.
```

POST LAB EXERCISE

1. What is the purpose of the Scanner object in the Java program?

The **Scanner object** is used to take input from the user at runtime.

It belongs to the **Scanner** class, which is part of the java.util package.

Purpose:

- Read user input from keyboard
- Read different data types like:

int → nextInt()

double → nextDouble()

String → nextLine()

- Parse input into required data type

2. What exceptions are expected to be thrown in the code within the try block? Why?

- Scanner object is used to take user input from the keyboard.
- Expected exceptions:

ArithmeticException -when dividing by zero

InputMismatchException - when wrong input type is entered

- These occur due to invalid mathematical operations or incorrect user input.

NumberFormatException - Converting string to number fails

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	**5**	
In Lab Exercise	**10**	
Post Lab Exercise	**5**	
Viva	**10**	
Total	**30**	
Faculty Signature		