SCD Lab Report # 10

Submitted to: Mam Fatima Gillani

Submitted by: Amna Saqlain

Department: BSSE – 5B

Roll No: SP23656

TASK # 1:

```java
import java.util.InputMismatchException;
import java.util.Scanner;

// Custom Exception class
class InvalidInputException extends Exception {
    public InvalidInputException(String message) {
        super(message);
    }
}

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

        // Task 1: ArithmeticException
        try {
            System.out.println("Enter two numbers for division:");
            int numerator = scanner.nextInt();
            int denominator = scanner.nextInt();
            int result = numerator / denominator;
            System.out.println("Result: " + result);
        } catch (ArithmeticException e) {
            System.out.println("Error: ArithmeticException - Division by zero is
not allowed.");
        }

        // Task 2: ArrayIndexOutOfBoundsException
        try {
            int[] array = {1, 2, 3};
            System.out.println("Enter an index to access the array:");
            int index = scanner.nextInt();
            System.out.println("Value at index " + index + ": " + array[index]);
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Error: ArrayIndexOutOfBoundsException - Invalid
array index.");
        }

        // Task 3: Multiple Catch Blocks
```

```java
        try {
            System.out.println("Enter a number to process:");
            int input = scanner.nextInt();
            int[] numbers = {10, 20};
            int result = 100 / input;
            System.out.println("Value at index " + input + ": " +
numbers[input]);
        } catch (ArithmeticException e) {
            System.out.println("Error: ArithmeticException - Division by zero in
multiple catch block.");
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Error: ArrayIndexOutOfBoundsException - Invalid
index in multiple catch block.");
        } catch (Exception e) {
            System.out.println("Error: " + e.getClass().getSimpleName() + " - An
unexpected error occurred: " + e.getMessage());
        }

        // Task 4: InputMismatchException
        try {
            System.out.println("Enter an integer:");
            int number = scanner.nextInt();
            System.out.println("You entered: " + number);
        } catch (InputMismatchException e) {
            System.out.println("Error: InputMismatchException - Please enter a
valid integer.");
            scanner.nextLine();
        }

        // Task 5: Custom Exception
        try {
            System.out.println("Enter your age:");
            int age = scanner.nextInt();
            if (age < 0) {
                throw new InvalidInputException("Age cannot be negative.");
            }
            System.out.println("Your age is: " + age);
        } catch (InvalidInputException e) {
            System.out.println("Error: InvalidInputException - " +
e.getMessage());
        } catch (InputMismatchException e) {
            System.out.println("Error: InputMismatchException - Please enter a
valid integer for age.");
        } finally {
```

```
            scanner.close();
        }
    }
}
```

Output:

```
 Enter two numbers for division:
 24
 2
 Result: 12
 Enter an index to access the array:
 6
 Error: ArrayIndexOutOfBoundsException - Invalid array index.
 Enter a number to process:
 Enter an index to access the array:
 6
 Error: ArrayIndexOutOfBoundsException - Invalid array index.
 Enter a number to process:
 6
 Error: ArrayIndexOutOfBoundsException - Invalid array index.
 Enter a number to process:
 Error: ArrayIndexOutOfBoundsException - Invalid array index.
○Enter a number to process:
 Enter a number to process:
 9
 Error: ArrayIndexOutOfBoundsException - Invalid index in multiple catch block.
 Enter an integer:
 2
 You entered: 2
 Enter your age:
 22
 Your age is: 22
```

```
 93b2-270fa7a823f8Enter two numbers for division:
 10
 0
 Error: ArithmeticException - Division by zero is not allowed.
 Enter an index to access the array:
 5
 Error: ArrayIndexOutOfBoundsException - Invalid array index.
 Enter a number to process:
 0
 Error: ArithmeticException - Division by zero in multiple catch block.
 Enter an integer:
 abc
 Error: InputMismatchException - Please enter a valid integer.
 Enter your age:
 22
 Your age is: 22
○PS C:\Users\dell> █
```

TASK # 2

Password Validation:

```java
import java.util.Scanner;
```

```java
class PasswordException extends Exception {
    public PasswordException(String message) {
        super(message);
    }
}

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

        System.out.print("Enter a password: ");
        String password = sc.nextLine();

        try {
            validatePassword(password);
            System.out.println(" Password is valid.");
        } catch (PasswordException e) {
            System.out.println("Invalid! " + e.getMessage());
        }

        sc.close();
    }


    public static void validatePassword(String pass) throws PasswordException {
        if (pass.length() < 8) {
            throw new PasswordException("Password must be at least 8 characters
long.");
        }
        if (!pass.matches(".*[A-Z].*")) {
            throw new PasswordException("Password must contain at least one
uppercase letter.");
        }
        if (!pass.matches(".*\\d.*")) {
            throw new PasswordException("Password must contain at least one
number.");
        }
        if (!pass.matches(".*[!@#$].*")) {
            throw new PasswordException("Password must contain at least one
special character (!@#$).");
        }
```

```
        if (pass.contains(" ")) {
            throw new PasswordException("Password must not contain spaces.");
        }
    }
}
```

Output:

```
5-ed5da63ed90aEnter a password: mypas1!
Invalid! Password must be at least 8 characters long.
```

```
 2-e609feaa4823Enter a password: mypass1!
 Invalid! Password must contain at least one uppercase letter.
```

```
 8-59f737f4e336Enter a password: Mypass@!
 Invalid! Password must contain at least one number.
```

```
 6-c16582238151Enter a password: MyPass1!
  Password is valid.
```

```
 c-34173f9edff8Enter a password: My pass1!
 Invalid! Password must not contain spaces.
```

TEST CASES:

Test Cases	Password	Expected Result
TC1	mypas1!	Invalid! Password must be at least 8 characters long.
TC2	mypass1!	Invalid! Password must contain at least one uppercase letter.
TC3	Mypass@!	Invalid! Password must contain at least one number.
TC4	MyPass1!	Password is valid.
TC5	My pass1!	Invalid! Password must not contain spaces.