PROBLEM STATEMENT :

Write a
Java Program to find the factorial of 'n' integers (as command line arguments
CLA). Write your own exception "FactorialException" to validate integer values
to be in certain range. Sample call: java ExceptionDemo 8 – 6 14 abcd 5

1) Static
main method invokes another method "factorial()"

2) CLA
which are strings but interpreted as integer values.

3) The
user-defined exception class

FactorialException should have proper constructors / overridden
toString() method to display exception message along with the wrong input
number that had generated the exception.

NumberFormatException
(ill-formed CLA)

And

Your
Exception class

FactorialException (n<0 and n>15)

Part 2:

Define an
exception class called "NOMATCHEXCP" that is thrown when the string from the
keyboard is not equal to "India". Write a Demo program using try-catch block
that shows the use of this user-defined exception. Class NOMATCHEXCP should
have a parameterized constructor and the exception message generated should
show the line number and the erroneous String that was inputted by the user.

CODE:

Part-1
```
/*
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LAB ASSIGNMENT - 8
*/
package As8;

```java
// Create a custom exception class
class MyExcep extends Exception {
    MyExcep(String message) {
        super(message);
    }
}

public class As8_part1 {
    public static void main(String[] args) {
        // Loop through each argument passed to the program
        for (String arg : args) {
            try {
                // Convert the argument to an integer
                int n = Integer.parseInt(arg);
                // Check if the integer is out of range (1 to 10)
                if (n < 1 || n > 10) {
                    // Throw a custom exception if the integer is out of range
                    throw new MyExcep("Value out of range (1 to 10) for " + n);
                }
                // If the integer is in range, calculate its factorial and print the result
                System.out.println("Factorial of " + n + " is " + factorial(n));
            } catch (NumberFormatException e) {
                // If the argument cannot be converted to an integer, catch the exception and print an error message
                System.out.println("Invalid input: " + e.getMessage());
            } catch (MyExcep e) {
                // If the integer is out of range, catch the custom exception and print the error message
                System.out.println(e.getMessage());
            }
        }
    }

    // Calculate the factorial of an integer
    private static int factorial(int n) {
        int result = 1;
        for (int i = 1; i <= n; i++) {
            result *= i;
        }
        return result;
    }
}
```

Part-2

```java
package As8;

import java.util.Scanner;

import java.util.Scanner;

// Custom exception class that is thrown when input string does not match "India"
class NOMATCHEXCP extends Exception {

    // Constructor that takes the line number and input string and constructs the error message
    NOMATCHEXCP(int line, String input) {
        super("Error on line " + line + ": Input string \"" + input + "\" does not match \"India\"");
    }
}

public class As8_part2 {
    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        try {
            // Prompt user to enter a string
            System.out.print("Enter a string: ");
            String input = scanner.nextLine();

            // If the input does not match "India", throw the custom exception with the line number
            if (!input.equals("India")) {
                throw new NOMATCHEXCP(new Throwable().getStackTrace()[0].getLineNumber(),
input);
                // Using new Throwable().getStackTrace()[0].getLineNumber() to get the current line
number
                // where the user input is taken, assuming that this is the line where the exception
should be thrown
            }

            // If input matches "India", print success message
            System.out.println("Input string matches \"India\"");

        } catch (NOMATCHEXCP e) {
            // Catch the custom exception and print the error message
            System.out.println(e.getMessage());
        }
    }
```

}

OUTPUT :

Part-1

```
kspaceStorage\cb1420810f38ca5841a24d24c4e397c8\redhat.j
ava\jdt_ws\Java projects_a4f80daa\bin' 'As8_part1' 8 -6
 abc 5 20
Factorial of 8 is 40320
Value out of range (1 to 10) for -6
Invalid input: For input string: "abc"
Factorial of 5 is 120
Value out of range (1 to 10) for 20
```

Part-2

```
kspaceStorage\cb1420810f38ca5841a24d24c4e397c8\redhat.j
ava\jdt_ws\Java projects_a4f80daa\bin' 'As8_part2'
Enter a string: India
Input string matches "India"
PS C:\Users\erapo\Desktop\Java projects>  c:; cd 'c:\Us
ers\erapo\Desktop\Java projects'; & 'C:\Users\erapo\App
Data\Local\Programs\Eclipse Adoptium\jdk-17.0.5.8-hotsp
ot\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessag
es' '-cp' 'C:\Users\erapo\AppData\Roaming\Code\User\wor
kspaceStorage\cb1420810f38ca5841a24d24c4e397c8\redhat.j
ava\jdt_ws\Java projects_a4f80daa\bin' 'As8_part2'
Enter a string: not India
Error on line 8: Input string "not India" does not matc
h "India"
```

GitHub Repository: https://github.com/SnakeEyes1308/Java-Assignment-