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Main.java

Run

```
3- public static void main(String[] args) {
4-     int[][] matrixData1 = {
5-         {1, 2, 3},
6-         {4, 5, 6},
7-         {7, 8, 9}
8-     };
9-     int[][] matrixData2 = {
10-        {9, 8, 7},
11-        {6, 5, 4},
12-        {3, 2, 1}
13-    };
14-    Matrix matrix1 = new Matrix(matrixData1);
15-    Matrix matrix2 = new Matrix(matrixData2);
16-    Thread t1 = new MatrixThread("T1", matrix1);
17-    Thread t2 = new MatrixThread("T2", matrix2);
18-    Thread t3 = new MatrixAdditionThread("T3", matrix1, matrix2);
19-    Thread t4 = new MatrixCountThread("T4", matrix1, matrix2, t3);
20-    t1.start();
21-    t2.start();
22-    t4.start();
23-    try {
24-        t4.join();
25-    } catch (InterruptedException e) {
26-        e.printStackTrace();
27-    }
28-}
```

Output

Clear

java -cp /tmp/AZJ4JvQCBR/CombinedMatrixThreadsExample

T1 started. Matrix:
T4 started.
T2 started. Matrix:
9 8 7
6 5 4
3 2 1
T2 ended.
1 2 3
4 5 6
7 8 9
T1 ended.
T4: Total elements in matrix1: 9
T4: Total elements in matrix2: 9
T4 ended.
T3 started.
T3: Matrix addition result:
10 10 10
10 10 10
10 10 10
T3 ended.
Main thread exiting.

=== Code Execution Successful ===

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Main.javaRun

```
4 Thread t1 = new NumberThread("T1", 10000);
5 Thread t2 = new NumberThread("T2", 5000);
6 t1.start();
7 t2.start();
8 try {
9     t1.join();
10    t2.join();
11 } catch (InterruptedException e) {
12     e.printStackTrace();
13 }
14
15 System.out.println("Main thread exiting.");
16 }
17 }
18 class NumberThread extends Thread {
19
20     private String name;
21     private int sleepTime;
22     public NumberThread(String name, int sleepTime) {
23         this.name = name;
24         this.sleepTime = sleepTime;
25     }
26     @Override
27     public void run() {
28         System.out.println(name + " started.");
29     }
29 }
```

OutputClear

```
java -cp /tmp/wAemUJLwQw/JoinOrSleepThreads
T1 started.
T2 started.
T1 does not contain even numbers. Joining T1.
T1 ended.
T2 contains even numbers. Putting T2 to sleep for 5000ms.
T2 ended.
Main thread exiting.

=== Code Execution Successful ===
```

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Main.java

Run

Clear

```
11  @Override
12  public void run() {
13      System.out.println("ArmstrongThread started.");
14      try {
15          for (int i = 1; i <= limit; i++) {
16              if (isArmstrong(i)) {
17                  System.out.println("Armstrong number found: " + i);
18              }
19              Thread.sleep(200);
20          }
21      } catch (InterruptedException e) {
22          System.out.println("ArmstrongThread interrupted.");
23      }
24      System.out.println("ArmstrongThread ended.");
25  }
26  private boolean isArmstrong(int number) {
27      int originalNumber = number;
28      int sum = 0;
29      while (number > 0) {
30          int digit = number % 10;
31          sum += Math.pow(digit, 3);
32          number /= 10;
33      }
34      return sum == originalNumber;
35  }
36  }
```

```
java -cp ./tmp/JmcNytEs01/CombinedThreadExample
ArmstrongThread started.
FibonacciThread started.
Fibonacci number: 0
Armstrong number found: 1
Fibonacci number: 1
Fibonacci number: 1
Fibonacci number: 2
Fibonacci number: 3
Fibonacci number: 5
Fibonacci number: 8
Fibonacci number: 13
Fibonacci number: 21
Fibonacci number: 34
FibonacciThread ended.
Armstrong number found: 153
```

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Main.java

Run

```
5 Thread t1 = new TimingThread("Thread 1", 5);
6 Thread t2 = new TimingThread("Thread 2", 3);
7 t1.start();
8 t2.start();
9 try {
10     t1.join();
11     t2.join();
12 } catch (InterruptedException e) {
13     e.printStackTrace();
14 }
15 long t1TotalTime = ((TimingThread) t1).getTotalWaitingAndSleepingTime();
16 long t2TotalTime = ((TimingThread) t2).getTotalWaitingAndSleepingTime();
17
18 System.out.println("Total waiting and sleeping time for " + t1.getName() +
19     ": " + t1TotalTime + " milliseconds");
20 System.out.println("Total waiting and sleeping time for " + t2.getName() +
21     ": " + t2TotalTime + " milliseconds");
22
23 if (t1TotalTime > t2TotalTime) {
24     System.out.println(t1.getName() + " has longer waiting and sleeping
25     time.");
26 } else if (t2TotalTime > t1TotalTime) {
27     System.out.println(t2.getName() + " has longer waiting and sleeping
28     time.");
29 } else {
30     System.out.println("Both threads have equal waiting and sleeping time");
31 }
```

Output

Clear

```
java -cp /tmp/M2eT1Yw1mS/ThreadTimingExample
Thread 2 is running iteration 0
Thread 1 is running iteration 0
Thread 2 is running iteration 1
Thread 1 is running iteration 1
Thread 2 is running iteration 2
Thread 1 is running iteration 2
Thread 2 is running iteration 3
Thread 1 is running iteration 3
Thread 2 is running iteration 4
Thread 1 is running iteration 4
Total waiting and sleeping time for Thread 1: 1065 milliseconds
Total waiting and sleeping time for Thread 2: 1065 milliseconds
Both threads have equal waiting and sleeping time.

=== Code Execution Successful ===
```

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Main.java

Run

```
1- .....
2- .....
3- public NonIntegerInputException(String message) {
4-     super(message);
5- }
6- }
7- public class CustomNonIntegerExceptionHandler {
8-     public static void main(String[] args) {
9-         Scanner scanner = new Scanner(System.in);
10-        try {
11-            System.out.print("Enter an integer value: ");
12-            String userInput = scanner.nextLine();
13-            int value = validateIntegerInput(userInput);
14-            System.out.println("Integer entered: " + value);
15-        } catch (NonIntegerInputException e) {
16-            System.out.println("ERROR!\n" + e.getMessage());
17-        }
18-
19-        scanner.close();
20-    }
21-    public static int validateIntegerInput(String input) throws
NonIntegerInputException {
22-        try {
23-            return Integer.parseInt(input);
24-        } catch (NumberFormatException e) {
25-            throw new NonIntegerInputException("Non-integer input provided: " +
input + ". Please enter an integer value.");
26-        }
27-    }
28- }
```

Output

Clear

```
java -cp /tmp/ux4ENCTmCw/CustomDecimalExceptionHandler
Enter a valid decimal number: 2.45
Valid decimal number entered: 2.45

=== Code Execution Successful ===
```

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Main.java Run Output Clear

```
1 super(message);
2 }
3 }
4
5 }
6 }
7 public class CustomDecimalExceptionHandling {
8     public static void main(String[] args) {
9         Scanner scanner = new Scanner(System.in);
10        try {
11            System.out.print("Enter a valid decimal number: ");
12            String userInput = scanner.nextLine();
13            double value = validateDecimalNumber(userInput);
14            System.out.println("Valid decimal number entered: " + value);
15        } catch (InvalidDecimalException e) {
16            System.out.println("ERROR!\n" + e.getMessage());
17        }
18
19        scanner.close();
20    }
21    public static double validateDecimalNumber(String input) throws
        InvalidDecimalException {
22        try {
23            return Double.parseDouble(input);
24        } catch (NumberFormatException e) {
25            throw new InvalidDecimalException("Invalid decimal number provided:
                " + input + ". Please enter a valid decimal number.");
26        }
27    }
28 }
```

java -cp ./tmp/ux4ENCTmCw/CustomDecimalExceptionHandling
Enter a valid decimal number: 2.45
Valid decimal number entered: 2.45

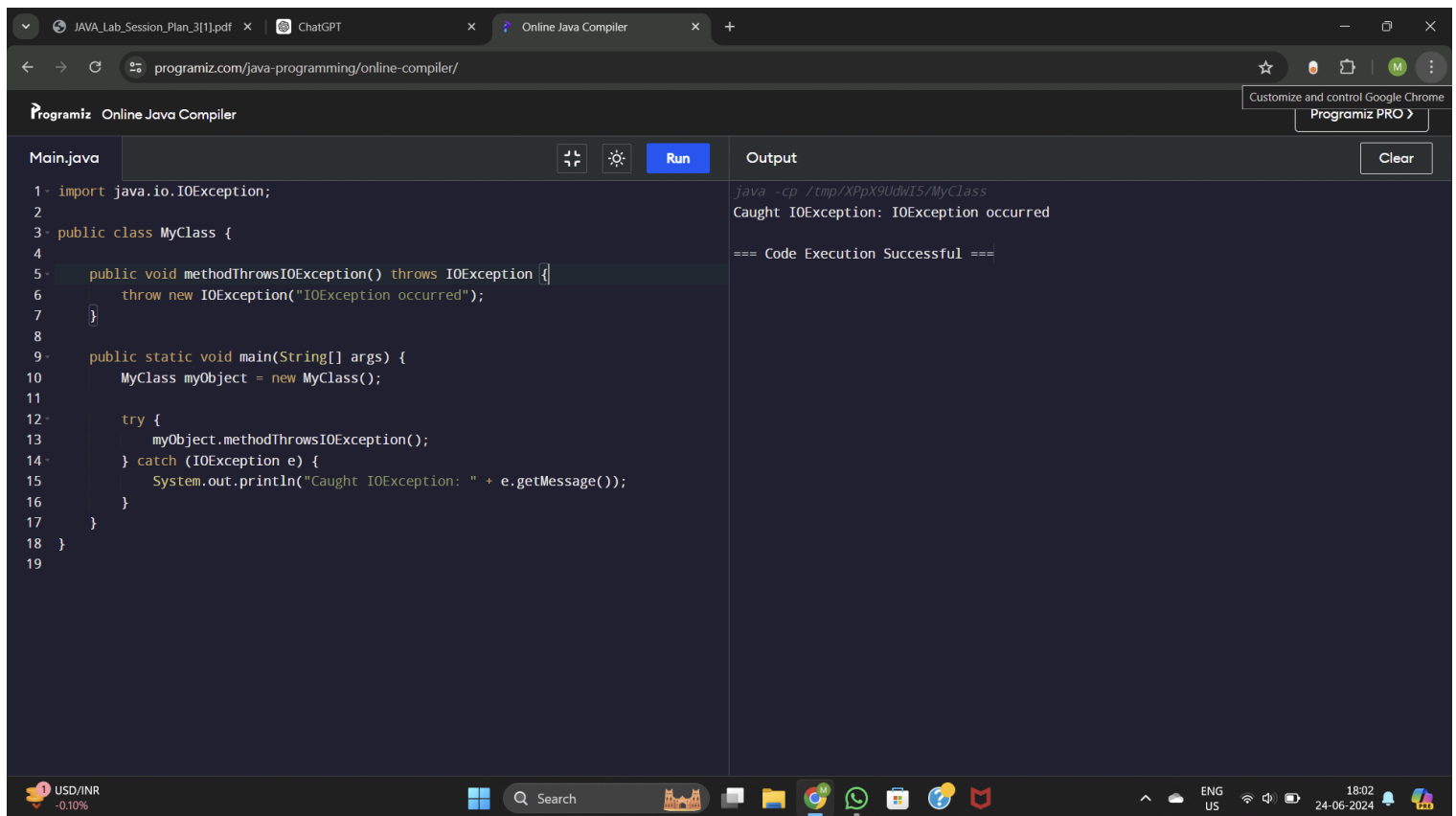
=== Code Execution Successful ===

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Main.java

Run

Clear

```
1 import java.util.Scanner;
2 class NegativeValueException extends Exception {
3     public NegativeValueException(String message) {
4         super(message);
5     }
6 }
7 public class CustomExceptionHandler {
8     public static void main(String[] args) {
9         Scanner scanner = new Scanner(System.in);
10        try {
11            System.out.print("Enter a non-negative value: ");
12            int value = scanner.nextInt();
13            setNonNegativeValue(value);
14        } catch (NegativeValueException e) {
15            System.out.println("ERROR!\n" + e.getMessage());
16        }
17
18        scanner.close();
19    }
20    public static void setNonNegativeValue(int value) throws
        NegativeValueException {
21        if (value < 0) {
22            throw new NegativeValueException("Negative value provided: " +
                value + ". Value must be non-negative.");
23        }
24        System.out.println("Non-negative value set: " + value);
25    }
26 }
```

```
java -cp /tmp/roLINvfguz/CustomExceptionHandler
Enter a non-negative value: 5
Non-negative value set: 5

=== Code Execution Successful ===
```

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Main.java

9 Scanner scanner = new Scanner(System.in);

10 try {

11 System.out.print("Enter a string to parse as an integer: ");

12 String nonNumericString = scanner.nextLine();

13 int number = Integer.parseInt(nonNumericString);

14 System.out.println("Parsed number: " + number);

15 } catch (NumberFormatException e) {

16 System.out.println("Error: Unable to parse the string as an integer

17 .");

18 }

19 try {

20 System.out.print("Enter a number: ");

21 String userInput = scanner.nextLine();

22 double userNumber = Double.parseDouble(userInput);

23 System.out.println("Entered number: " + userNumber);

24 } catch (NumberFormatException e) {

25 System.out.println("Error: Invalid number format entered.");

26 }

27 try {

28 System.out.print("Enter a decimal number: ");

29 String decimalString = scanner.nextLine();

30 DecimalFormat decimalFormat = new DecimalFormat("#.##");

31 double parsedDecimal = decimalFormat.parse(decimalString

doubleValue());

System.out.println("Formatted number: " + decimalFormat.format

(parsedDecimal));

Output

Clear

java -cp /tmp/RYZsQer4v1/NumberFormatExceptionHandling

Enter a string to parse as an integer: mahendra

ERROR!

Error: Unable to parse the string as an integer.

Enter a number: 6

Entered number: 6.0

Enter a decimal number: 2.53

Formatted number: 2.53

Enter a number with a comma as a decimal separator (e.g., 123,45): 274,173

Parsed number with localized format: 274.173

=== Code Execution Successful ===

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Main.java

Run

Output

Clear

```
4- try {
5-     setNonNegativeValue(-5);
6- } catch (IllegalArgumentException e) {
7-     System.out.println("ERROR!\nError: Negative argument provided. " +
8-         e.getMessage());
9- }
10- try {
11-     String invalidEnum = "INVALID_ENUM";
12-     setDayOfWeek(DayOfWeek.valueOf(invalidEnum));
13- } catch (IllegalArgumentException e) {
14-     System.out.println("ERROR!\nError: Invalid enum constant provided.
15-         " + e.getMessage());
16- }
17- try {
18-     setRangeValue(15);
19- } catch (IllegalArgumentException e) {
20-     System.out.println("ERROR!\nError: Invalid range provided. " + e
21-         .getMessage());
22- }
23- try {
24-     setNonEmptyString("");
25- } catch (IllegalArgumentException e) {
26-     System.out.println("ERROR!\nError: Empty or null string provided. "
27-         + e.getMessage());
28- }
```

```
java -cp /tmp/7mf0Bob57X/IllegalArgumentExceptionHandling
ERROR!
ERROR!
Error: Negative argument provided. Value must be non-negative.
ERROR!
ERROR!
Error: Invalid enum constant provided. No enum constant IllegalArgumentExceptionHandling
.DayOfWeek.INVALID_ENUM
ERROR!
ERROR!
Error: Invalid range provided. Value must be between 0 and 10.
ERROR!
ERROR!
Error: Empty or null string provided. String cannot be null or empty.
ERROR!
Error: Empty or null string provided. String cannot be null or empty.

=== Code Execution Successful ===
```

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