

LAB # 3

Introduction to Concurrency

OBJECTIVE

Understanding and implementing the concept of concurrency through different mechanisms of multithreading.

Lab Task:

1. Implement the following program on eclipse IDE and answer the following questions:

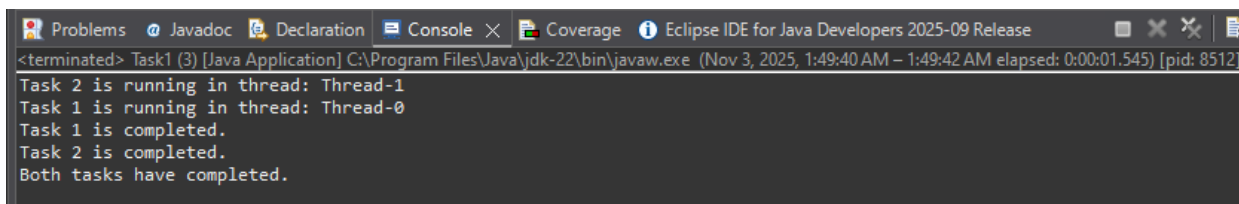
- How many threads are running?
- How many tasks are running?
- If more tasks are added than what will be the impact on number of threads?
- Explain the flow of program:

Code:



```
1 package Lab3;
2 public class Task1 {
3     public static void main(String[] args) {
4         Thread task1 = new Thread(() -> runTask("Task 1"));
5         Thread task2 = new Thread(() -> runTask("Task 2"));
6         task1.start();
7         task2.start();
8         try {
9             task1.join();
10            task2.join();
11        } catch (InterruptedException e) {
12            e.printStackTrace();
13        }
14        System.out.println("Both tasks have completed.");
15    }
16    private static void runTask(String taskName) {
17        System.out.println(taskName + " is running in thread: " + Thread.currentThread().getName());
18        try {
19            Thread.sleep(1000);
20        } catch (InterruptedException e) {
21            e.printStackTrace();
22        }
23        System.out.println(taskName + " is completed.");
24    }
25 }
```

Output:



```
<terminated> Task1 (3) [Java Application] C:\Program Files\Java\jdk-22\bin\javaw.exe (Nov 3, 2025, 1:49:40 AM – 1:49:42 AM elapsed: 0:00:01.545) [pid: 8512]
Task 2 is running in thread: Thread-1
Task 1 is running in thread: Thread-0
Task 1 is completed.
Task 2 is completed.
Both tasks have completed.
```

- With the help of threading print two tables concurrently, print one table number of student roll number e.g., 2019-SE-092 and second number should be date of birth e.g., 05-April.

Code:

```

Task2.java ×
1 package Lab3;
2 public class Task2 {
3     public static void main(String[] args) {
4         String dob = "05-April";
5         String rollNumber = "2019-SE-092";
6         Thread studentThread = new Thread(() -> printStudentTables(dob, rollNumber));
7         studentThread.start();
8         try {
9             studentThread.join();
10        } catch (InterruptedException e) {
11            e.printStackTrace();
12        }
13        System.out.println("The table for the student has been printed.");
14    }
15    private static void printStudentTables(String dob, String rollNumber) {
16        int dobDay = Integer.parseInt(dob.split("-")[0]);
17        int roll = Integer.parseInt(rollNumber.split("-")[2]);
18        for (int i = 1; i <= 10; i++) {
19            System.out.println(dob + " x " + i + " = " + (dobDay * i));
20            System.out.println(rollNumber + " x " + i + " = " + (roll * i));
21        }
22    }
23 }

```

Output:

```

Problems Javadoc Declaration Console × Coverage Eclipse IDE for Java Developers 2025-09 Release
<terminated> Task2 (1) [Java Application] C:\Program Files\Java\jdk-22\bin\javaw.exe (Nov 3, 2025, 2:12:03 AM – 2:12:03 AM elapsed: 0:00:00.551) [pid: 1
05-April x 1 = 5
2019-SE-092 x 1 = 92
05-April x 2 = 10
2019-SE-092 x 2 = 184
05-April x 3 = 15
2019-SE-092 x 3 = 276
05-April x 4 = 20
2019-SE-092 x 4 = 368
05-April x 5 = 25
2019-SE-092 x 5 = 460
05-April x 6 = 30
2019-SE-092 x 6 = 552
05-April x 7 = 35
2019-SE-092 x 7 = 644
05-April x 8 = 40
2019-SE-092 x 8 = 736
05-April x 9 = 45
2019-SE-092 x 9 = 828
05-April x 10 = 50
2019-SE-092 x 10 = 920
The table for the student has been printed.

```