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:

Explanation:

1. Number of Threads Running

- The program creates three separate threads (t1, t2, and t3) by calling the start() method on each object.
- In addition to these, the main thread executes the main() method.

Total Threads = 4 (3 user threads + 1 main thread)

2. Number of Tasks Running

- Each thread executes the run() method once, which prints "task one".
- Therefore, there are three independent tasks running concurrently.

Total Tasks = 3

3. Impact of Adding More Tasks

- If additional Main thread objects are created and started, each new task will run in its own thread.
- This means the number of threads will increase linearly with the number of tasks.
- However, creating too many threads may lead to performance issues due to overhead from context switching and memory usage.

More tasks → More threads → Increased CPU and memory usage

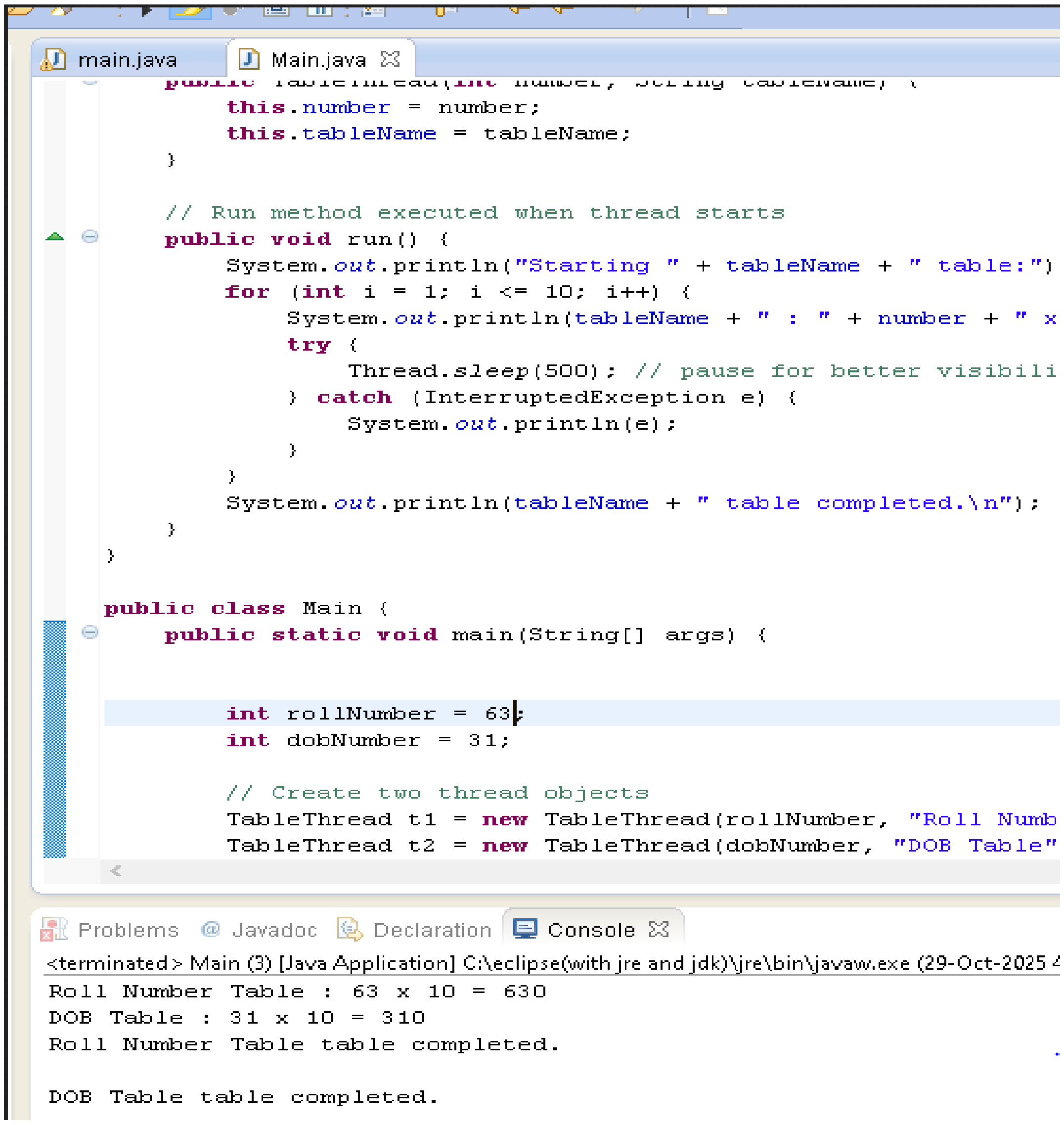
4. Program Flow

1. The program starts executing in the main thread.

2. Three Main objects (t1, t2, t3) are created.
3. Each start() call creates a new thread and invokes its run() method.
4. All three threads execute concurrently, printing "task one".
5. The order of output is not guaranteed because thread scheduling is handled by the JVM and operating system.

2. 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:



```
    public TableThread(int number, String tableName) {
        this.number = number;
        this.tableName = tableName;
    }

    // Run method executed when thread starts
    public void run() {
        System.out.println("Starting " + tableName + " table:")
        for (int i = 1; i <= 10; i++) {
            System.out.println(tableName + " : " + number + " x
            try {
                Thread.sleep(500); // pause for better visibili
            } catch (InterruptedException e) {
                System.out.println(e);
            }
        }
        System.out.println(tableName + " table completed.\n");
    }
}

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


        int rollNumber = 63;
        int dobNumber = 31;

        // Create two thread objects
        TableThread t1 = new TableThread(rollNumber, "Roll Numb
        TableThread t2 = new TableThread(dobNumber, "DOB Table"
```

```
<terminated> Main (3) [Java Application] C:\eclipse(with jre and jdk)\jre\bin\javaw.exe (29-Oct-2025
Roll Number Table : 63 x 10 = 630
DOB Table : 31 x 10 = 310
Roll Number Table table completed.

DOB Table table completed.
```