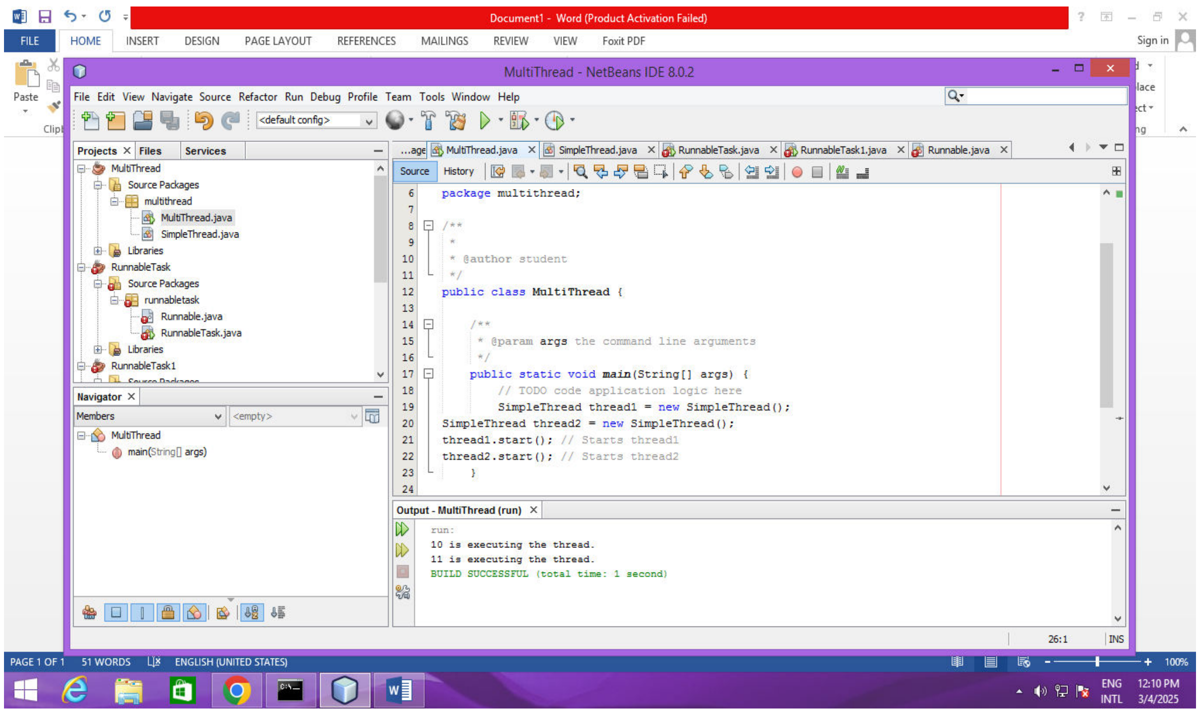
GAM/IT/2022/F/0033

LAB2-TASK 01

```
public class SimpleThread extends Thread {


public void run() {

System.out.println(Thread.currentThread().getId() + " is executing the thread.");

}

}

public static void main(String[] args) {

SimpleThread thread1 = new SimpleThread();

SimpleThread thread2 = new SimpleThread();

thread1.start();

thread2.start();

   }

   }
```

OUTPUT



```
package multithread;

/**
 *
 * @author student
 */
public class MultiThread {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        // TODO code application logic here
        SimpleThread thread1 = new SimpleThread();
SimpleThread thread2 = new SimpleThread();
thread1.start(); // Starts thread1
thread2.start(); // Starts thread2
    }
```

```
run:
10 is executing the thread.
11 is executing the thread.
BUILD SUCCESSFUL (total time: 1 second)
```

Document1 - Word (Product Activation Failed)
MultiThread - NetBeans IDE 8.0.2
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Projects Files Services
MultiThread
Source Packages
multithread
MultiThread.java
SimpleThread.java
Libraries
RunnableTask
runnabletask
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RunnableTask.java
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MultiThread
main(String[] args)
MultiThread.java SimpleThread.java RunnableTask.java RunnableTask1.java Runnable.java
Output - MultiThread (run)
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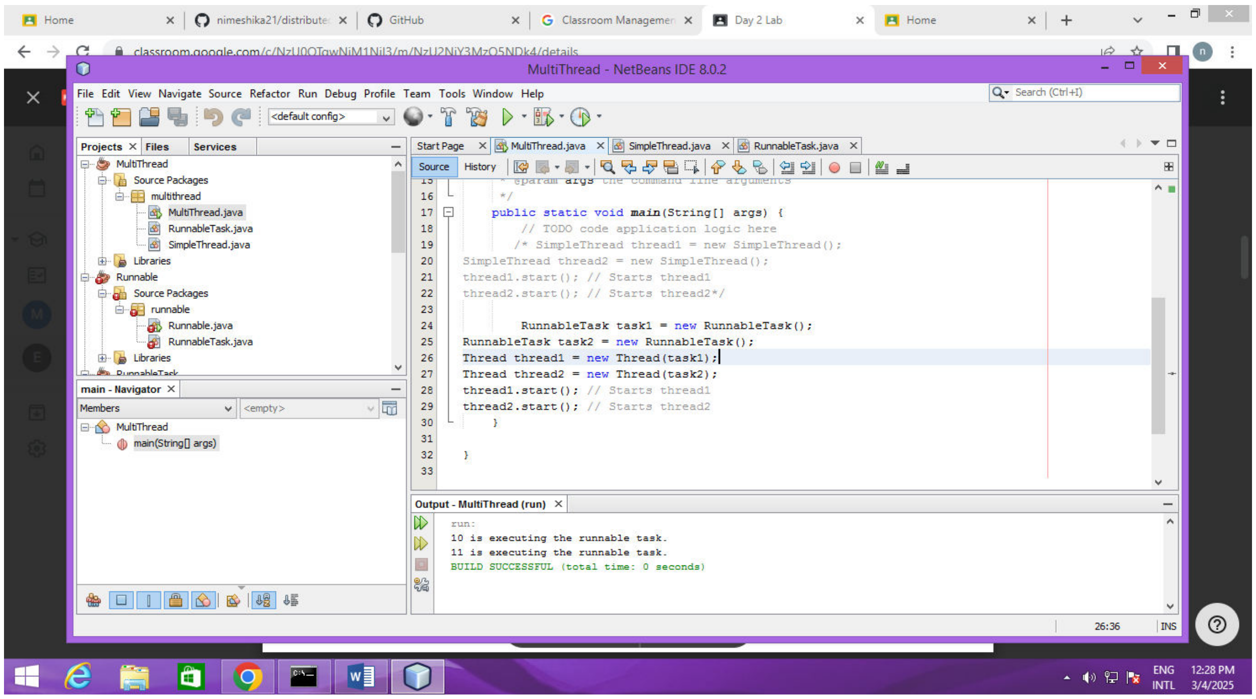
2) Lab02- TASK 02

```
public class RunnableTask implements Runnable {

public void run() {

System.out.println(Thread.currentThread().getId() + " is executing the runnable task.");

   }

   }

public static void main(String[] args) {

RunnableTask task1 = new RunnableTask();

RunnableTask task2 = new RunnableTask();

Thread thread1 = new Thread(task1);

Thread thread2 = new Thread(task2);

thread1.start();

thread2.start();

   }

   }
```

OUTPUT



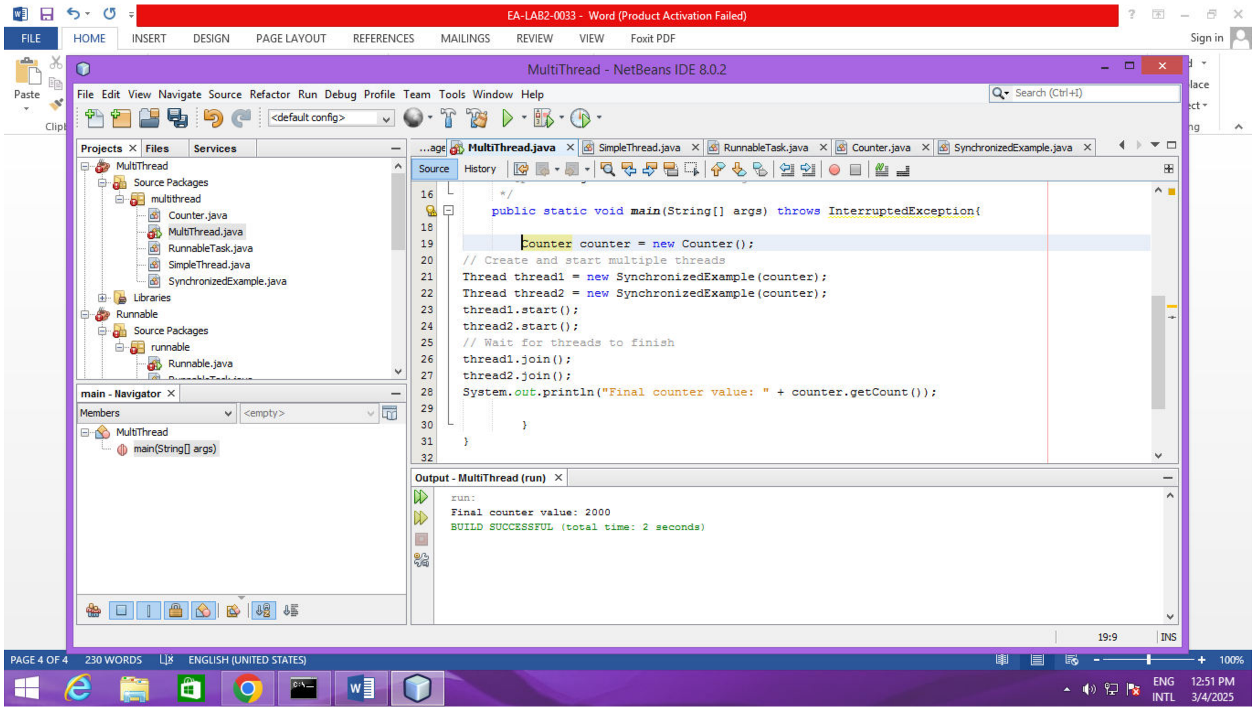
```
         * @param args the command line arguments
         */
        public static void main(String[] args) {
            // TODO code application logic here
           /* SimpleThread thread1 = new SimpleThread();
SimpleThread thread2 = new SimpleThread();
thread1.start(); // Starts thread1
thread2.start(); // Starts thread2*/

            RunnableTask task1 = new RunnableTask();
RunnableTask task2 = new RunnableTask();
Thread thread1 = new Thread(task1);
Thread thread2 = new Thread(task2);
thread1.start(); // Starts thread1
thread2.start(); // Starts thread2
        }

}
```

```
run:
10 is executing the runnable task.
11 is executing the runnable task.
BUILD SUCCESSFUL (total time: 0 seconds)
```

3) LAB03-TASK-03

```
public class Counter {
privateint count = 0;
// Synchronized method to ensure thread-safe access to the counter
public synchronized void increment() {
count++;
}
publicintgetCount() {
return count;  }
public class SynchronizedExample extends Thread{
private Counter counter;
publicSynchronizedExample(Counter counter) {
this.counter = counter;  }
@Override
public void run() {
for (inti = 0; i< 1000; i++) {
counter.increment();
}}}
public static void main(String[] args) throws InterruptedException{
Counter counter = new Counter;
Thread thread1 = new SynchronizedExample(counter);
Thread thread2 = new SynchronizedExample(counter);
thread1.start();
thread2.start();

thread1.join();
thread2.join();
System.out.println("Final counter value: " + counter.getCount());  } }
```

OUTPUT



```
    */
    public static void main(String[] args) throws InterruptedException{

        Counter counter = new Counter();
// Create and start multiple threads
Thread thread1 = new SynchronizedExample(counter);
Thread thread2 = new SynchronizedExample(counter);
thread1.start();
thread2.start();
// Wait for threads to finish
thread1.join();
thread2.join();
System.out.println("Final counter value: " + counter.getCount());

        }
}
```

Output - MultiThread (run)

```
run:
Final counter value: 2000
BUILD SUCCESSFUL (total time: 2 seconds)
```

4) Lab02-task-04

package multithread;

importjava.util.concurrent.ExecutorService;

importjava.util.concurrent.Executors;

class Task implements Runnable {

privateinttaskId;

public Task(inttaskId) {

this.taskId = taskId;

}

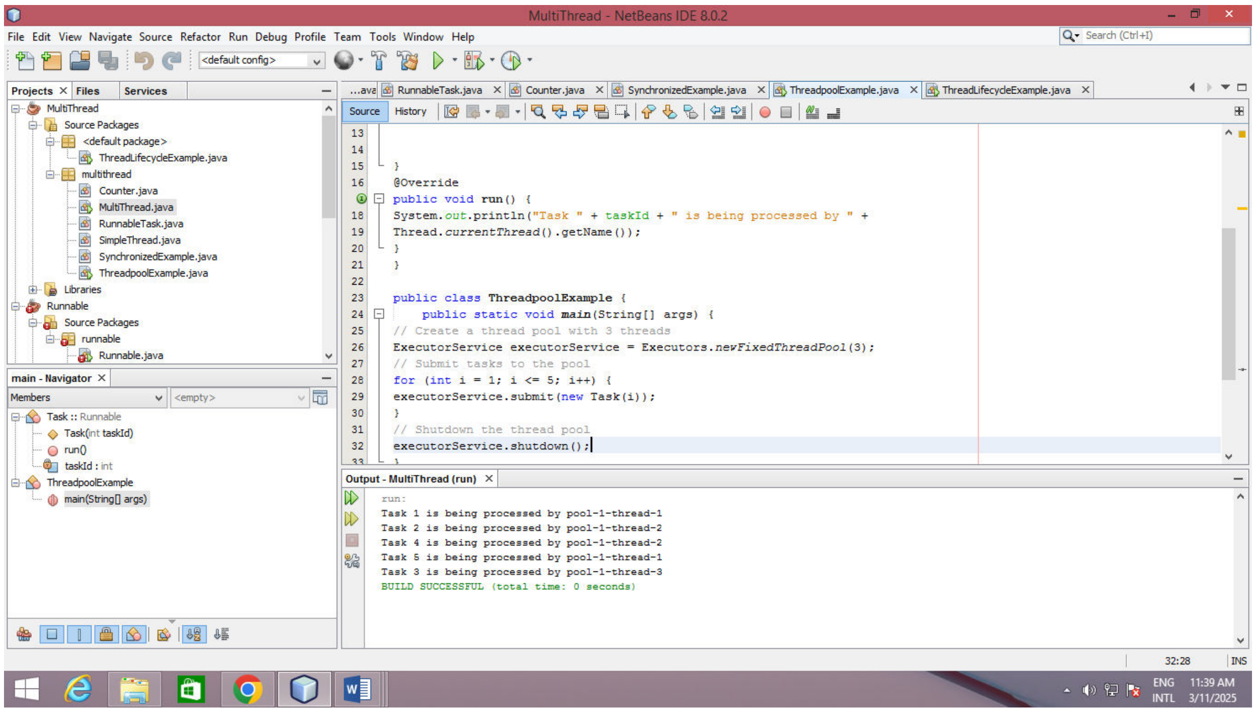
@Override

public void run() {

System.out.println("Task " + taskId + " is being processed by " +

```
Thread.currentThread().getName());
}
}


public class ThreadpoolExample {
public static void main(String[] args) {
// Create a thread pool with 3 threads
ExecutorServiceexecutorService = Executors.newFixedThreadPool(3);
// Submit tasks to the pool
for (inti = 1; i<= 5; i++) {
executorService.submit(new Task(i));
}
// Shutdown the thread pool
executorService.shutdown();
}
}
```

OUTPUT



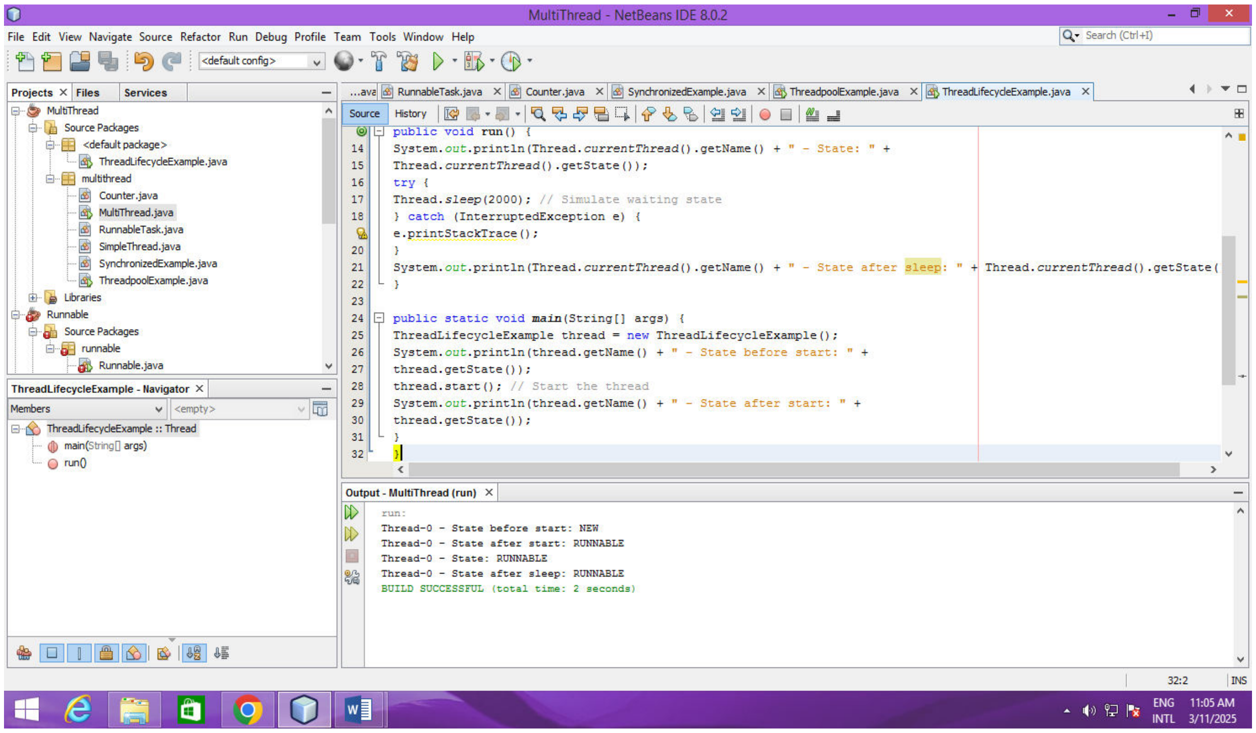
```
    }
@Override
public void run() {
System.out.println("Task " + taskId + " is being processed by " +
Thread.currentThread().getName());
}
}

public class ThreadpoolExample {
    public static void main(String[] args) {
// Create a thread pool with 3 threads
ExecutorService executorService = Executors.newFixedThreadPool(3);
// Submit tasks to the pool
for (int i = 1; i <= 5; i++) {
executorService.submit(new Task(i));
}
// Shutdown the thread pool
executorService.shutdown();
```

```
run:
Task 1 is being processed by pool-1-thread-1
Task 2 is being processed by pool-1-thread-2
Task 4 is being processed by pool-1-thread-2
Task 5 is being processed by pool-1-thread-1
Task 3 is being processed by pool-1-thread-3
BUILD SUCCESSFUL (total time: 0 seconds)
```

5) Lab02- TASK 05

```
public class ThreadLifecycleExample extends Thread{
   @Override
public void run() {
System.out.println(Thread.currentThread().getName() + " - State: " +
Thread.currentThread().getState());
try {
Thread.sleep(2000);
} catch (InterruptedException e) {
e.printStackTrace();
}
System.out.println(Thread.currentThread().getName() + " - State after sleep: " +
Thread.currentThread().getState());
}
public static void main(String[] args) {
ThreadLifecycleExample thread = new ThreadLifecycleExample();
System.out.println(thread.getName() + " - State before start: " +thread.getState());
thread.start();
System.out.println(thread.getName() + " - State after start: " +
thread.getState());
}
}
```

OUTPUT



```java
public void run() {
System.out.println(Thread.currentThread().getName() + " - State: " +
Thread.currentThread().getState());
try {
Thread.sleep(2000); // Simulate waiting state
} catch (InterruptedException e) {
e.printStackTrace();
}
System.out.println(Thread.currentThread().getName() + " - State after sleep: " + Thread.currentThread().getState(
}

public static void main(String[] args) {
ThreadLifecycleExample thread = new ThreadLifecycleExample();
System.out.println(thread.getName() + " - State before start: " +
thread.getState());
thread.start(); // Start the thread
System.out.println(thread.getName() + " - State after start: " +
thread.getState());
}
}
```

Output - MultiThread (run)

```
run:
Thread-0 - State before start: NEW
Thread-0 - State after start: RUNNABLE
Thread-0 - State: RUNNABLE
Thread-0 - State after sleep: RUNNABLE
BUILD SUCCESSFUL (total time: 2 seconds)
```