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Roll no. 05

SEMAPHORE & MUTEX

```
import java.util.concurrent.Semaphore;
```

```
import java.util.Scanner;
```

```
public class Semaphoreclass {  
    static Semaphore mutex = new Semaphore(1);  
    static Semaphore wrt = new Semaphore(1);  
    static int readCount = 0;  
    static String message = "Hello";  
    static Scanner SC = new Scanner(System.in);  
    static class Reader implements Runnable {  
        public void run() {  
            try {  
                //Acquire Section  
                mutex.acquire();  
                readCount++;  
                if (readCount == 1) {  
                    wrt.acquire();  
                }  
                mutex.release();  
                //Reading section  
                System.out.println("Thread "+Thread.currentThread().getName() + " is READING: " +  
message);  
                Thread.sleep(1500);  
                System.out.println("Thread "+Thread.currentThread().getName() + " has FINISHED  
READING");  
                //Releasing section  
                mutex.acquire();  
                readCount--;  
                if(readCount == 0) {  
                    wrt.release();  
                }  
            }  
        }  
    }  
}
```

```

    }
    mutex.release();
} catch (InterruptedException e) {
    System.out.println(e.getMessage());
}
}
}

static class Writer implements Runnable {
    public void run() {
        try {
            wrt.acquire();

            message = "Good Morning";

            System.out.println("Thread "+Thread.currentThread().getName() + " is WRITING: " +
message);

            Thread.sleep(1500);

            System.out.println("Thread "+Thread.currentThread().getName() + " has finished
WRITING");

            wrt.release();
        } catch (InterruptedException e) {
            System.out.println(e.getMessage());
        }
    }
}

//Main Program

public static void main(String[] args) throws Exception {
    Reader read = new Reader();
    Writer write = new Writer();
    Thread r1 = new Thread(read);
    r1.setName("Reader1");
    Thread r2 = new Thread(read);
    r2.setName("Reader2");
    Thread r3 = new Thread(read);
    r3.setName("Reader3");

```

```

Thread w1 = new Thread(write);
w1.setName("Writer1");
Thread w2 = new Thread(write);
w2.setName("Writer2");
Thread w3 = new Thread(write);
w3.setName("Writer3");

w1.start();
r1.start();
w2.start();
r2.start();
w3.start();
r3.start();

}
}

```

OUTPUT:

```

PS C:\Users\shree> & 'C:\Program Files\Java\jdk-19\bin\java.exe'
'-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:54501'
'-XX:+ShowCodeDetailsInExceptionMessages' '-cp'
'C:\Users\shree\AppData\Local\Temp\vscodesws_c115b\jdt_ws\jdt.ls-java-project\bin' 'Main'
Thread Writer1 is WRITING: Good Morning
Thread Writer1 has finished WRITING
Thread Reader2 is READING: Good Morning
Thread Reader1 is READING: Good Morning
Thread Reader3 is READING: Good Morning
Thread Reader2 has FINISHED READING
Thread Reader3 has FINISHED READING
Thread Reader1 has FINISHED READING
Thread Writer2 is WRITING: Good Morning
Thread Writer2 has finished WRITING
Thread Writer3 is WRITING: Good Morning
Thread Writer3 has finished WRITING

```