



Command Query Separation Principle

## *Principles*

Single Responsibility

Open Closed

Liskov Substitution

Interface Segregation

Dependency Inversion

Law of Demeter

Design by contract

Data encapsulation

Linguistic Modular Units

Self-Documentation

Uniform Access

Single Choice

Persistence Closure

**Command-Query-Separation**

Principle of Least Surprise

“Functions should not produce abstract side effects...only commands (procedures) will be permitted to produce side effects.”



BERTRAND MEYER: Object Oriented Software Construction

The fundamental idea is that we should divide an object's methods into two sharply separated categories:

- **Queries:** Return a result and do not change the observable state of the system (are free of side effects).
- **Commands:** Change the state of a system but do not return a value.





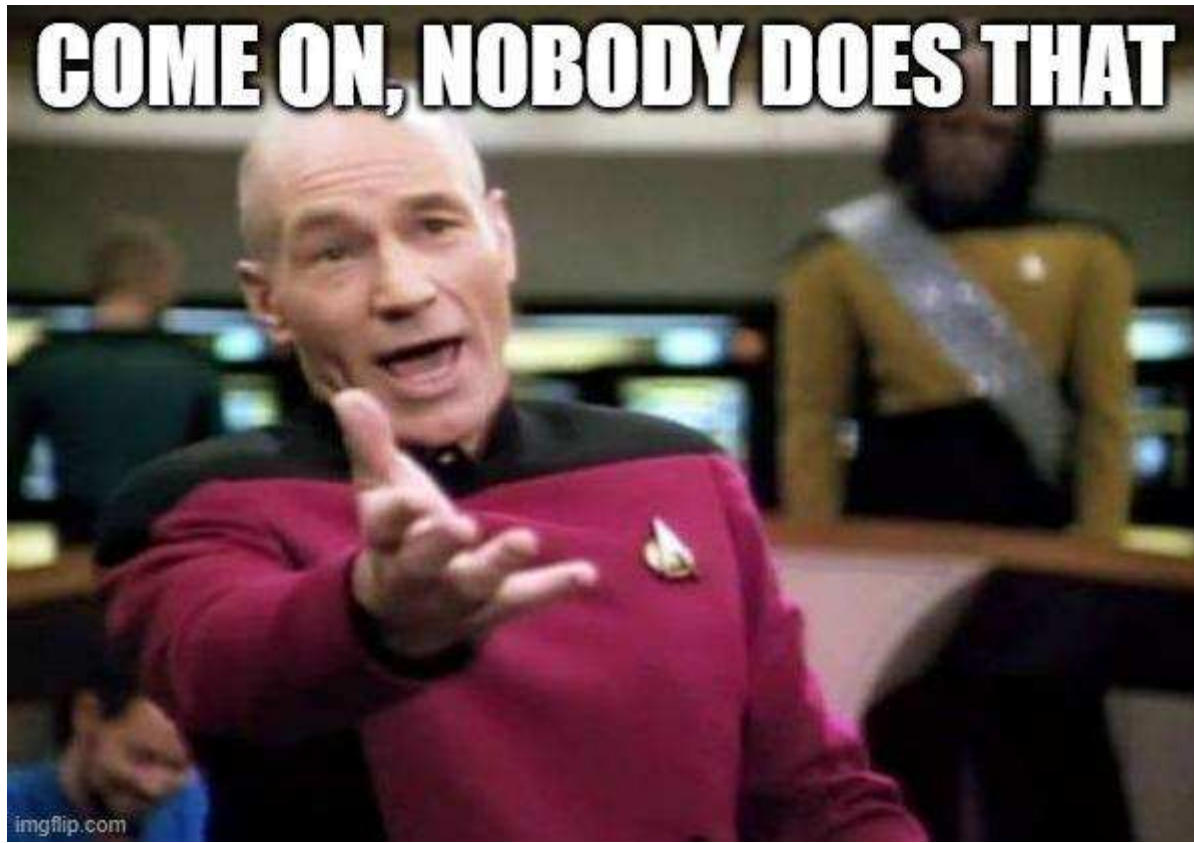
```
import java.time.LocalDateTime;  
import java.time.temporal.ChronoUnit;  
import java.util.Random;
```

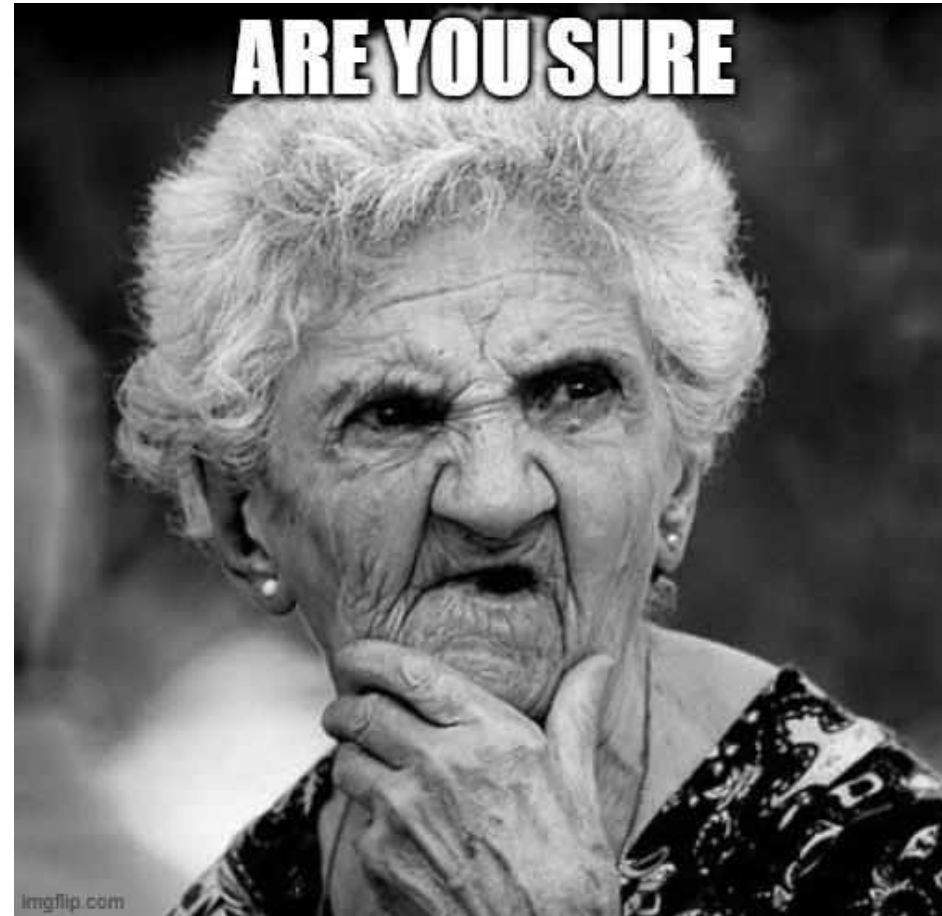
```
public class Alarm {
```

```
    private LocalDateTime wakeUpTime;  
    private boolean active = false;
```

```
? public LocalDateTime getWakeUpTime() {  
    int delay = new Random().nextInt(86400);  
    ! wakeUpTime = LocalDateTime.now().plus(delay, ChronoUnit.SECONDS);  
    active = true;  
    return wakeUpTime;  
}  
}
```

**COME ON, NOBODY DOES THAT**





```
User u = UserService.login(username, password);
```

```
Element e = Stack<Element>.pop();
```



```
import java.time.LocalDateTime;
```

```
public class Alarm {
```

```
    private LocalDateTime wakeUpTime;
```

```
    private boolean active = false;
```

```
    ! public void activateAlarm(LocalDateTime wakeUpTime) {  
        this.active = true;  
        this.wakeUpTime = wakeUpTime;  
    }
```

```
? public LocalDateTime getWakeUpTime() {  
    return wakeUpTime;  
}
```

```
? public boolean isAlarmActive() {  
    return active;  
}
```

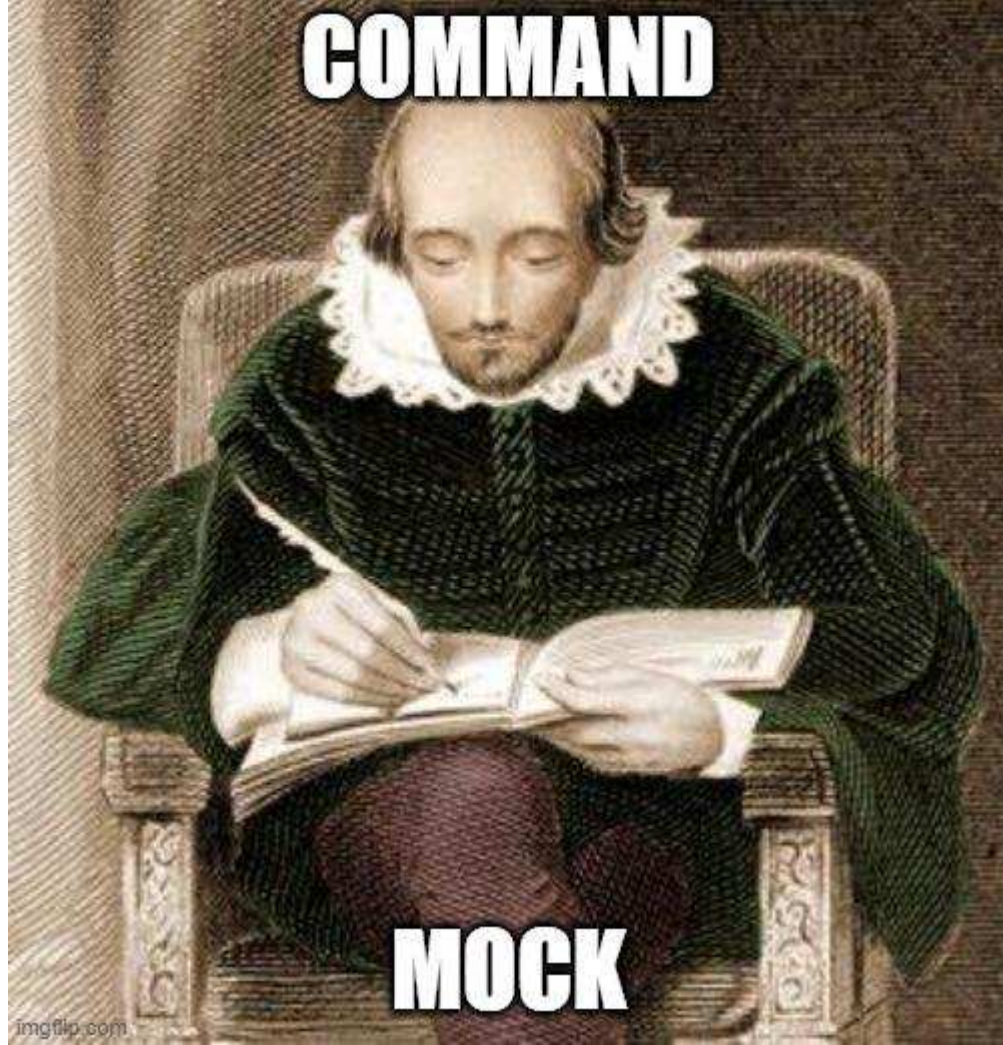


**WHAT ABOUT TEST DOUBLES**



!

**COMMAND**

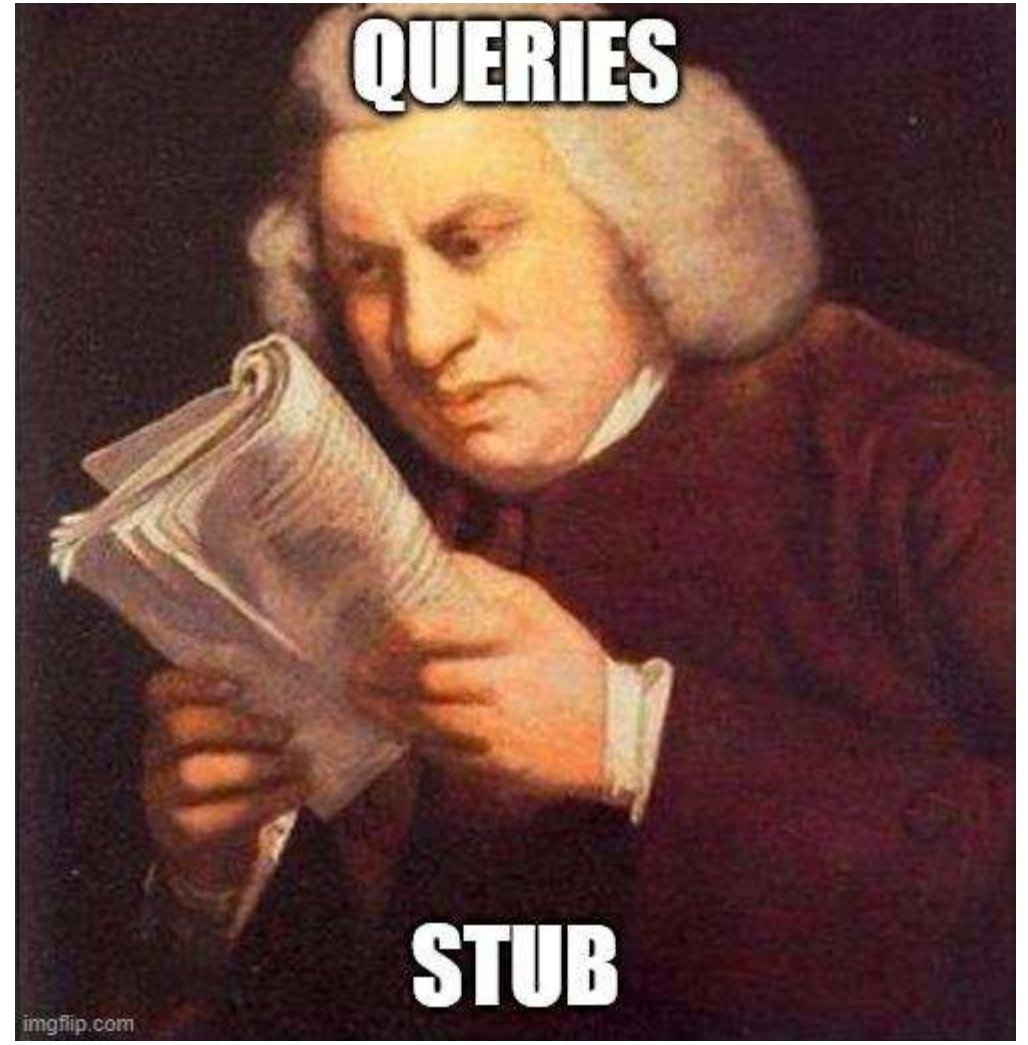


**MOCK**

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?

**QUERIES**



**STUB**

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**KNOW THE PRINCIPLES**

