

Java 'synchronized' - Cheat Sheet for Beginners

What is synchronized in Java?

- synchronized is a keyword used to make your code thread-safe.
- It ensures only one thread can access a block or method at a time.

Why use synchronized?

- To prevent race conditions and data inconsistency in multi-threaded programs.

Example 1: Synchronized Method

```
public class Counter {  
    int count = 0;  
    public synchronized void increment() {  
        count++;  
    }  
}
```

Example 2: Synchronized Block

```
public class Counter {  
    int count = 0;  
    public void increment() {  
        synchronized(this) {  
            count++;  
        }  
    }  
}
```

Without synchronized:

If two threads access count++ at the same time, both might read 5 and write 6.

Actual value should be 7 - but one increment is lost.

Think of it like:

Only one person can use a shared pen at a time - synchronized ensures safe access.

Key Points:

- synchronized = mutual exclusion (only one thread allowed).
- Can be used with methods or specific blocks of code.
- Helps avoid bugs in concurrent/multi-threaded programs.