Example Application of Java Volatile Variables

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Learning Objectives in this Part of the Lesson

• Understand how Java volatile variables provide concurrent programs with thread-safe mechanisms to read from & write to single variables

• Know how to use a Java volatile variable in practice

```java
class Singleton {
    private static volatile Singleton sInst = null;
    public static Singleton instance() {
        Singleton result = sInst;
        if (result == null) {
            synchronized(Singleton.class) {
                result = sInst;
                if (result == null)
                    sInst = result = new Singleton();
            }
        }
        return result;
    }
    ...
```
Using a Java Volatile Variable in Practice
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- e.g., it can be used to apply the *Double-Checked Locking* pattern to the *Singleton* pattern

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See [en.wikipedia.org/wiki/Singleton_pattern](en.wikipedia.org/wiki/Singleton_pattern)
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Reduces locking overhead via "lazy initialization" in a multi-threaded environment

See [en.wikipedia.org/wiki/Lazy_initialization](en.wikipedia.org/wiki/Lazy_initialization)
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*Ensures just the right amount of synchronization*
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*Only synchronizes when sInst is null, i.e., the “first time in”*
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*Note there are two checks for null (i.e., the “double-check”)
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Using a Java Volatile Variable in Practice

- Volatile is limited to a single read or write operation

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End of Example Application of Java Volatile Variables