Java Volatile Variables:

Example Application

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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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- Volatile is relatively simple & efficient means to ensure atomic reads & writes

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- e.g., it can be used to implement the *Double-Checked Locking* 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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```

*No synchronization after sInst is created*
Using a Java Volatile Variable in Practice

- Volatile is limited to a single read or write operation

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End of Volatile Variables: Example Application