Java ConditionObject: Common Use Cases

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Learning Objectives in this Part of the Lesson

• Understand what condition variables are
• Note a human known use of condition variables
• Know what pattern they implement
• Recognize common use cases where condition variables are applied
Applying Condition Variables in Practice
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- CVs are powerful, but can be hard to grok & apply correctly

See en.wikipedia.org/wiki/Grok
Applying Condition Variables in Practice

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- The protocol for using CVs involves several “moving parts”

CAUTION
BE ALERT!!
MOVING PARTS
• CVs are powerful, but can be hard to grok & apply correctly, e.g.
• The protocol for using CVs involves several “moving parts”
• i.e., a condition variable & a lock
CVs are powerful, but can be hard to grok & apply correctly, e.g.

- The protocol for using CVs involves several “moving parts”
- The non-determinism of concurrency is tricky

See [en.wikipedia.org/wiki/Nondeterministic_algorithm](en.wikipedia.org/wiki/Nondeterministic_algorithm)
Applying Condition Variables in Practice

• CVs are powerful, but can be hard to grok & apply correctly, e.g.
  • The protocol for using CVs involves several “moving parts”
  • The non-determinism of concurrency is tricky
  • i.e., a loop may be needed to ensure a resource is available

See stackoverflow.com/a/38313778
Applying Condition Variables in Practice

- CVs are therefore often not used directly by apps, but instead are “hidden” within other abstractions.
Applying Condition Variables in Practice

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- CVs form the basis for higher-level synchronizers in Java.

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/locks/AbstractQueuedSynchronizer.ConditionObject.html
Applying Condition Variables in Practice

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- CVs form the basis for higher-level synchronizers in Java, e.g.
  - Blocking queues & deques in java.util.concurrent* packages

See docs.oracle.com/javase/tutorial/collections/implementations/queue.html
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- Blocking queues & deques in java.util.concurrent* packages
  - e.g., ArrayBlockingQueue

Applying Condition Variables in Practice

See upcoming discussion in “Java ConditionObject: Example Application"
Applying Condition Variables in Practice

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- CVs form the basis for higher-level synchronizers in Java, e.g.
  - Blocking queues & deques in java.util.concurrent* packages
  - Java built-in monitor objects

See upcoming lesson on “Java Built-in Monitor Objects"
Applying Condition Variables in Practice

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- CVs form the basis for higher-level synchronizers in Java, e.g.
  - Blocking queues & deques in java.util.concurrent* packages
  - Java built-in monitor objects
  - The *Monitor Object* pattern

See [www.dre.vanderbilt.edu/~schmidt/PDF/monitor.pdf](http://www.dre.vanderbilt.edu/~schmidt/PDF/monitor.pdf)
End of Java ConditionObject: Common Use Cases