The Java Fork-Join Pool: Key Methods in RecursiveAction & RecursiveTask

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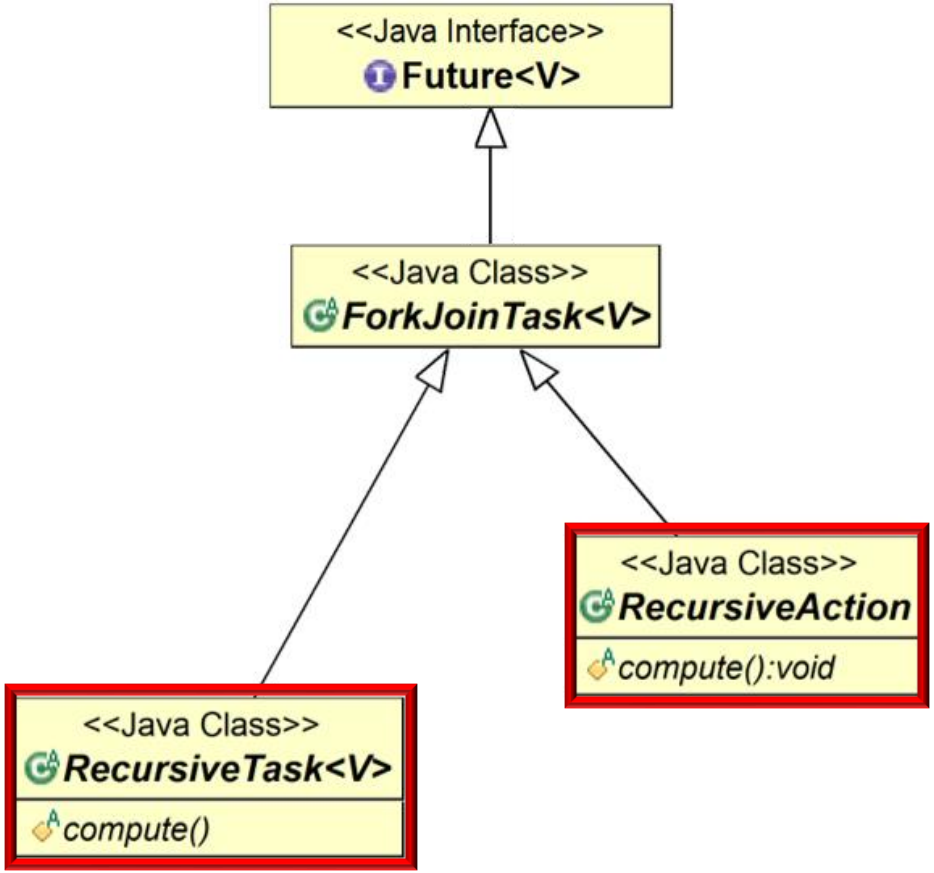
Learning Objectives in this Part of the Lesson

- Recognize the key methods in the RecursiveAction & RecursiveTask classes



Key Methods in the Java RecursiveAction

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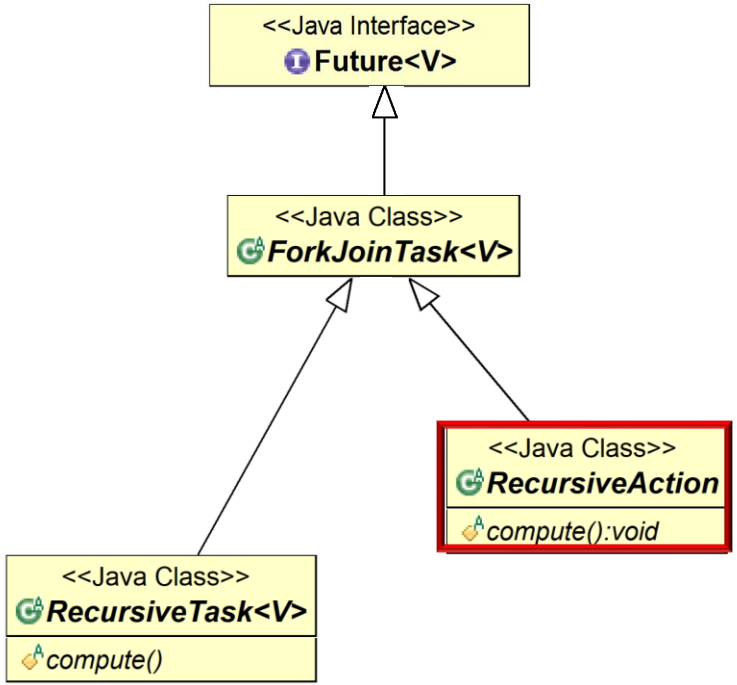
- RecursiveAction extends ForkJoin Task & does not return a result

```
abstract class RecursiveAction
  extends ForkJoinTask<Void> {
  ...
```



See docs.oracle.com/javase/8/docs/api/java/util/concurrent/RecursiveAction.html

Key Methods in Java RecursiveAction

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  - Subclasses override compute() to perform task's main computation

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abstract class RecursiveAction
  extends ForkJoinTask<Void> {
  protected abstract Void
    compute();
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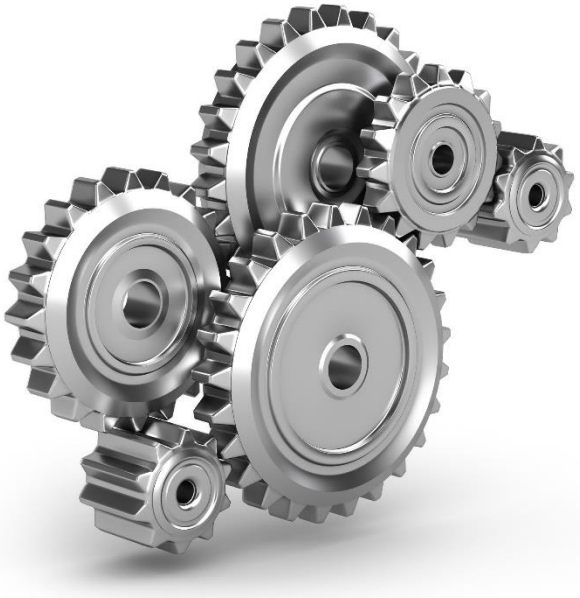

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/RecursiveTask.html#compute

Key Methods in Java RecursiveAction

- RecursiveAction extends ForkJoin Task & does not return a result
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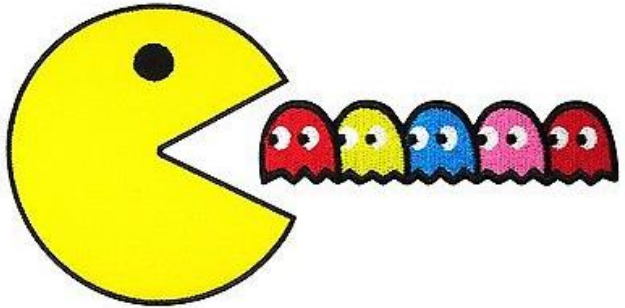

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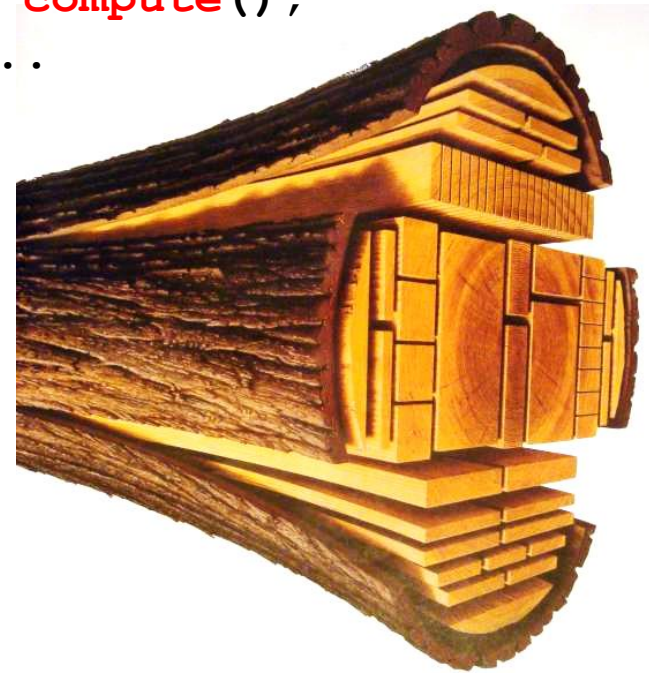

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  - Subclasses override compute() to perform task's main computation
    - If data size is below a certain threshold perform work directly
    - If data size is large, split work into smaller sub-tasks that are fork()'d to run in parallel
  - These smaller sub-tasks are join()'d, but a result is not returned directly
    - e.g., results may be stored in an array

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abstract class RecursiveAction
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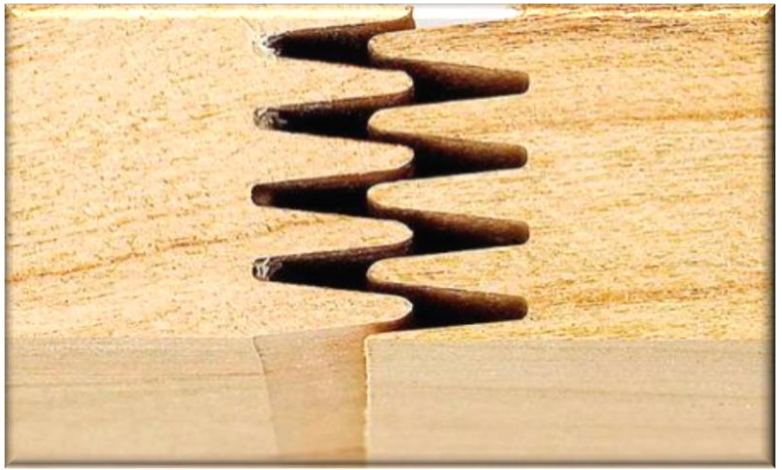

Key Methods in Java RecursiveAction

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  - The fork-join pool framework calls exec() to execute the task

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abstract class RecursiveAction
  extends ForkJoinTask<Void> {
  protected abstract Void
    compute();

  protected final boolean exec(){
    compute();
    return true;
  }
  ...
```

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/RecursiveTask.html#exec

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exec() is a template method & compute() is a hook method

See en.wikipedia.org/wiki/Template_method_pattern

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    compute();

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    return true;
  }
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```

The result of compute() is not stored for subsequent access

Key Methods in the Java RecursiveTask

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- RecursiveTask extends ForkJoinTask to return a result

```
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  extends ForkJoinTask<V> {
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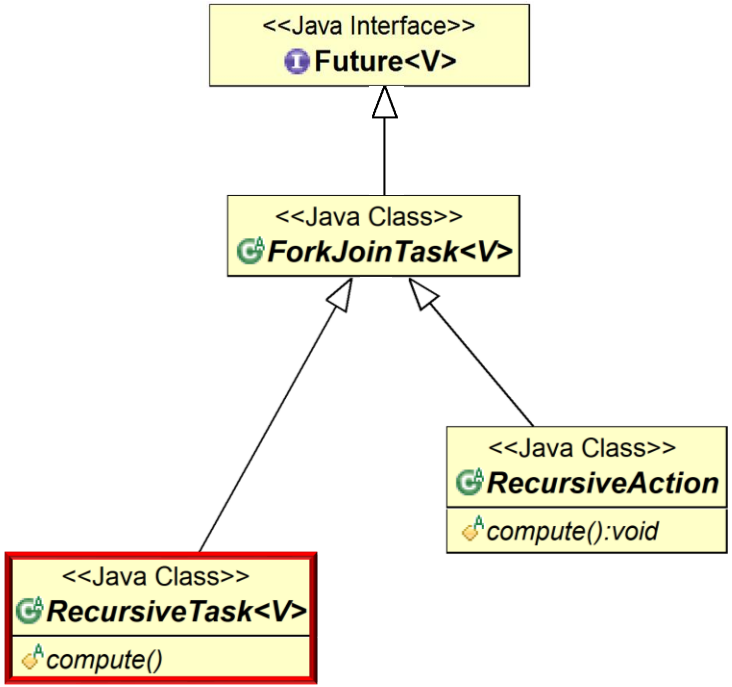

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Key Methods in Java RecursiveTask

- RecursiveTask extends ForkJoinTask to return a result
  - Subclasses override compute() to perform task's main computation

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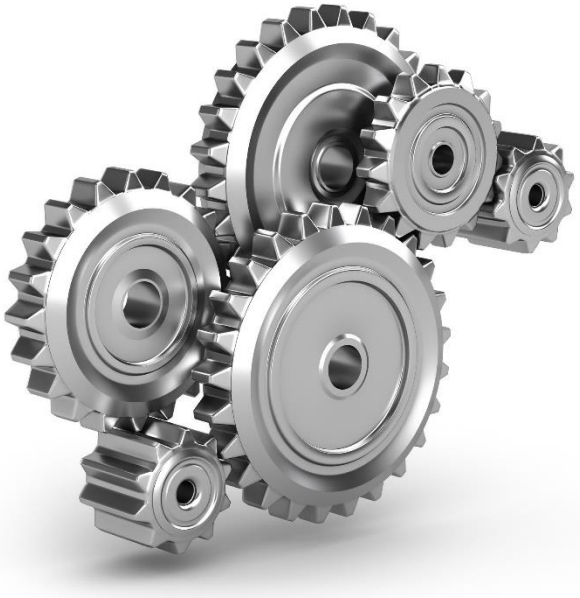
abstract class RecursiveTask<V>
  extends ForkJoinTask<V> {
  protected abstract V
    compute();
...
```



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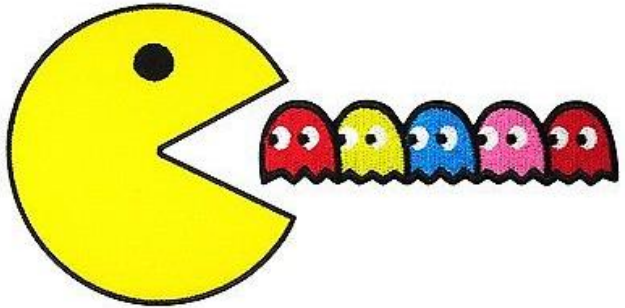

Key Methods in Java RecursiveTask

- RecursiveTask extends ForkJoinTask to return a result
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  protected abstract V
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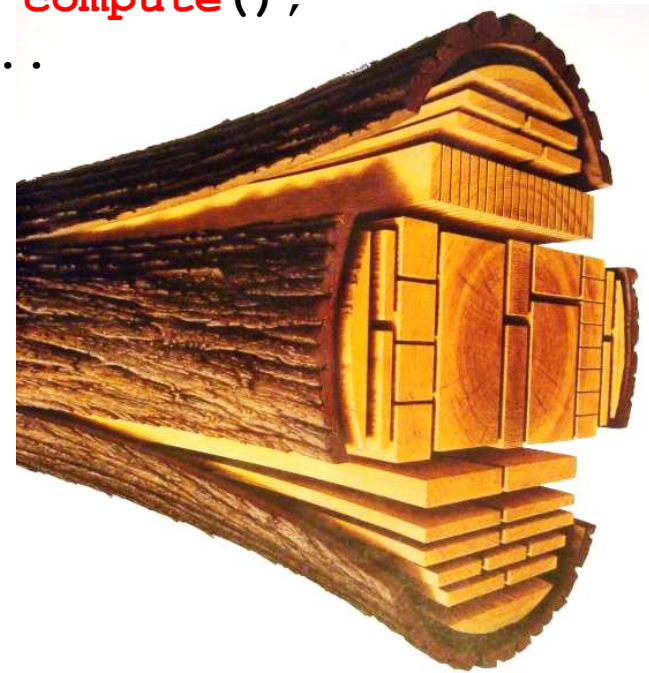

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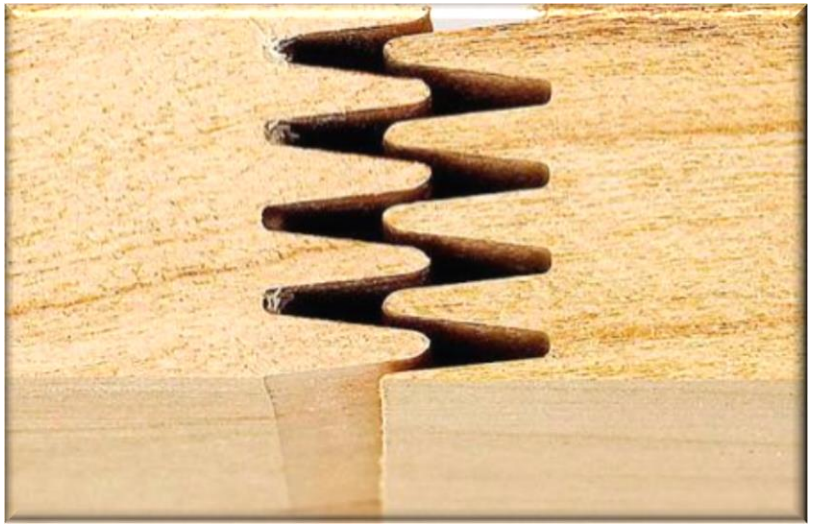
- RecursiveTask extends ForkJoinTask to return a result
  - Subclasses override compute() to perform task's main computation
    - If data size is below a certain threshold perform work directly
    - If data size is large, split work into smaller sub-tasks that are fork()'d to run in parallel
    - Results of these smaller sub-tasks are join()'d into a merged result

```
abstract class RecursiveTask<V>
  extends ForkJoinTask<V> {
  protected abstract V
    compute();
...
```



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- RecursiveTask extends ForkJoinTask to return a result
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abstract class RecursiveTask<V>
  extends ForkJoinTask<V> {
  protected abstract V
    compute();

  V result;

  protected final boolean exec(){
    result = compute();
    return true;
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```

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/RecursiveTask.html#exec

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The result of compute() is stored for subsequent access

End of the Java Fork-Join Pool: Key Methods in RecursiveAction & RecursiveTask