Evaluating the Cons of the Java Completable Futures Framework

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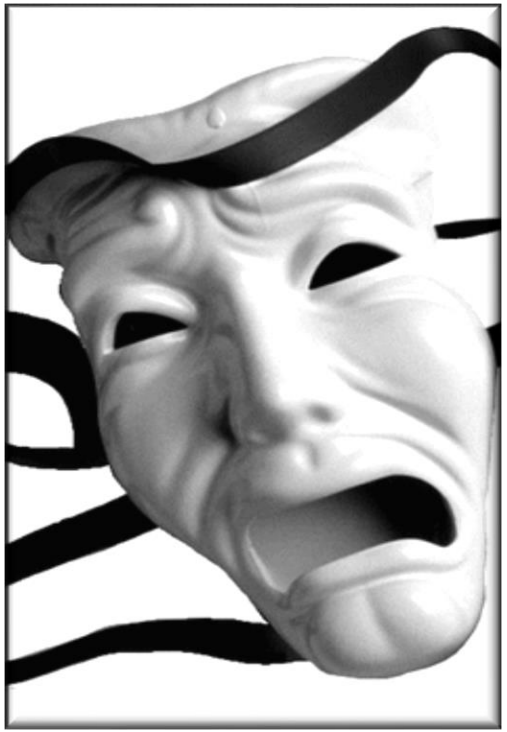
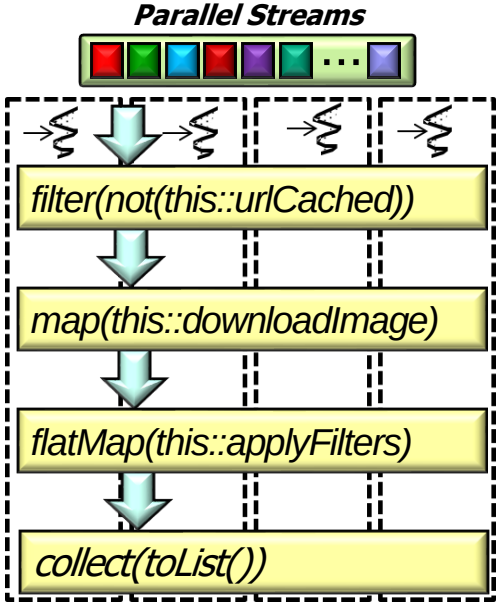
Learning Objectives in this Part of the Lesson

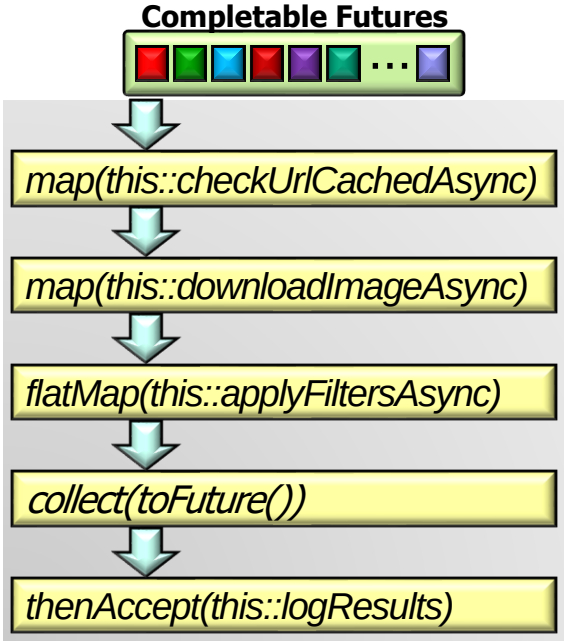
- Understand the pros of using the Java completable futures framework
- Understand the cons of using the Java completable futures framework



Learning Objectives in this Part of the Lesson

- Understand the pros of using the Java completable futures framework
- Understand the cons of using the Java completable futures framework
  - Again, we evaluate the Java completable futures framework compared with the parallel streams framework





See github.com/douglascraigschmidt/LiveLessons/tree/master/ImageStreamGang

Cons of the Java Completable Futures Framework

Cons of the Java Completable Futures Framework

- It's easier to program Java parallel streams than completable futures


```
void processStream() {
  List<URL> urls = getInput();

  List<Image> images =
  urls
  .parallelStream()
  .filter(not(this::urlCached))
  .map(this::blockingDownload)
  .flatMap(this::applyFilters)
  .collect(toList());

  logResults(images); ...
```


```
void processStream() {
  List<URL> urls = getInput();

  CompletableFuture<Stream<Image>>
  resultsFuture = urls
  .stream()
  .map(this::checkUrlCachedAsync)
  .map(this::downloadImageAsync)
  .flatMap(this::applyFiltersAsync)
  .collect(toFuture())
  .thenApply(this::logResults)
  .join(); ...
```

Cons of the Java Completable Futures Framework

- It's easier to program Java parallel streams than completable futures
  - The overall control flow is similar when using the Java streams framework

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Cons of the Java Completable Futures Framework

- It's easier to program Java parallel streams than completable futures
  - The overall control flow is similar when using the Java streams framework
  - However, async behaviors are more complicated than the sync behaviors!

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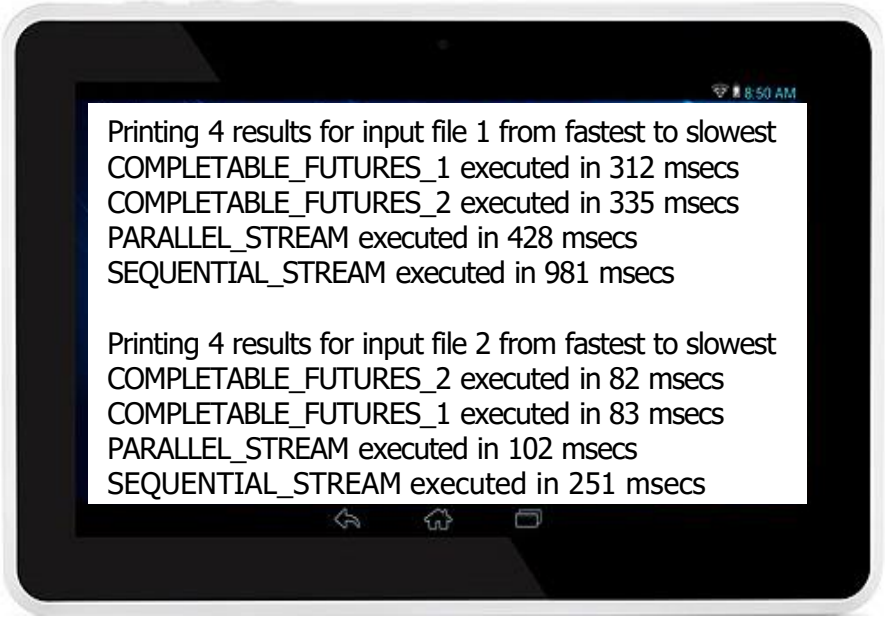
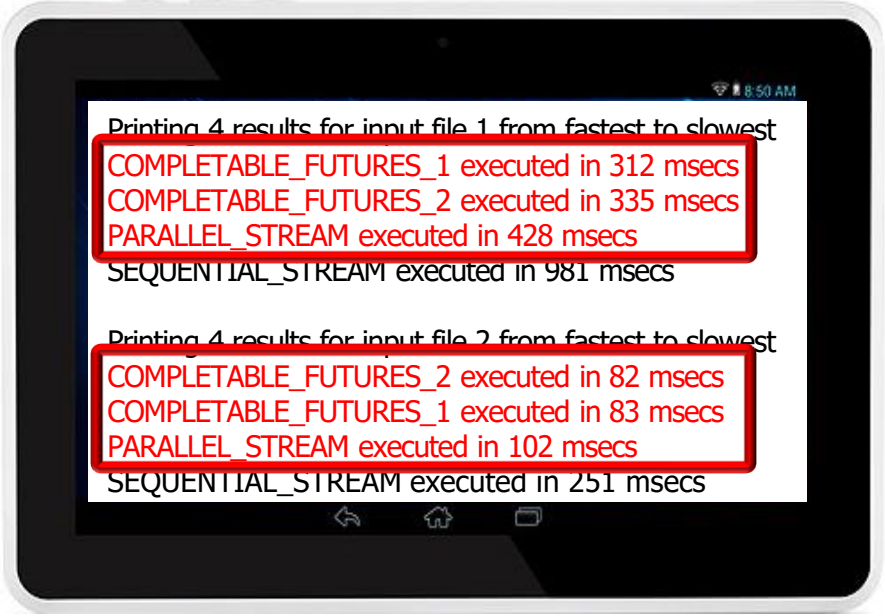
Cons of the Java Completable Futures Framework

- There's a tradeoff between computing performance & programmer productivity when choosing amongst these frameworks



Cons of the Java Completable Futures Framework

- There's a tradeoff between computing performance & programmer productivity when choosing amongst these frameworks, e.g.
  - Completable futures are more efficient & scalable, but are harder to program



In general, asynchrony patterns aren't well understood by many developers

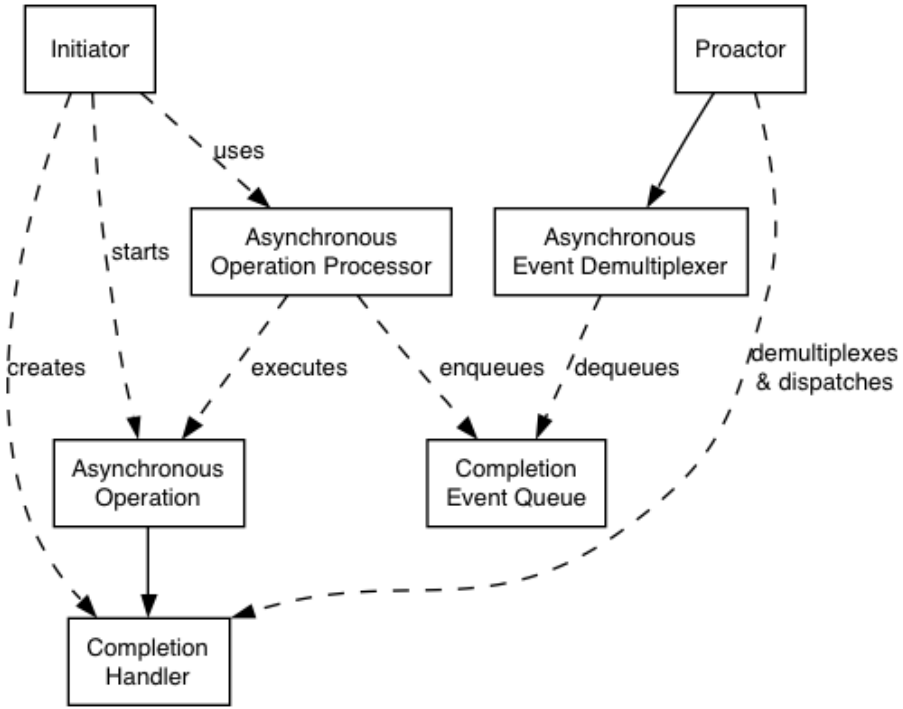
Cons of the Java Completable Futures Framework

- There's a tradeoff between computing performance & programmer productivity when choosing amongst these frameworks, e.g.
  - Completable futures are more efficient & scalable, but are harder to program
  - Parallel streams are easier to program, but are less efficient & scalable

Use sequential streams for initial development & then trivially make them parallel!

Cons of the Java Completable Futures Framework

- As usual, it is essential to know the better practices & patterns to program completable futures effectively!!



End of Evaluating the Cons of the Java Completable Futures Framework