Applying Java Structured Concurrency: Case Study ex2

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Learning Objectives in this Part of the Lesson

- Case study ex2 demos Java 19 structured concurrency features, which enable a main task to split into several concurrent sub-tasks that run concurrently to completion before the main task can complete
  - Java 19 enhances ExecutorService to support AutoCloseable & updates Executors w/new static factory methods that support usage in a structured manner

```
try (ExecutorService
      executor = Executors
     .newVirtualThreadPerTaskExecutor())
{
  return integers
     .stream()

     .map(primeCandidate ->
          checkPrimality
            (primeCandidate,
             executor))

     .toList();
}
```

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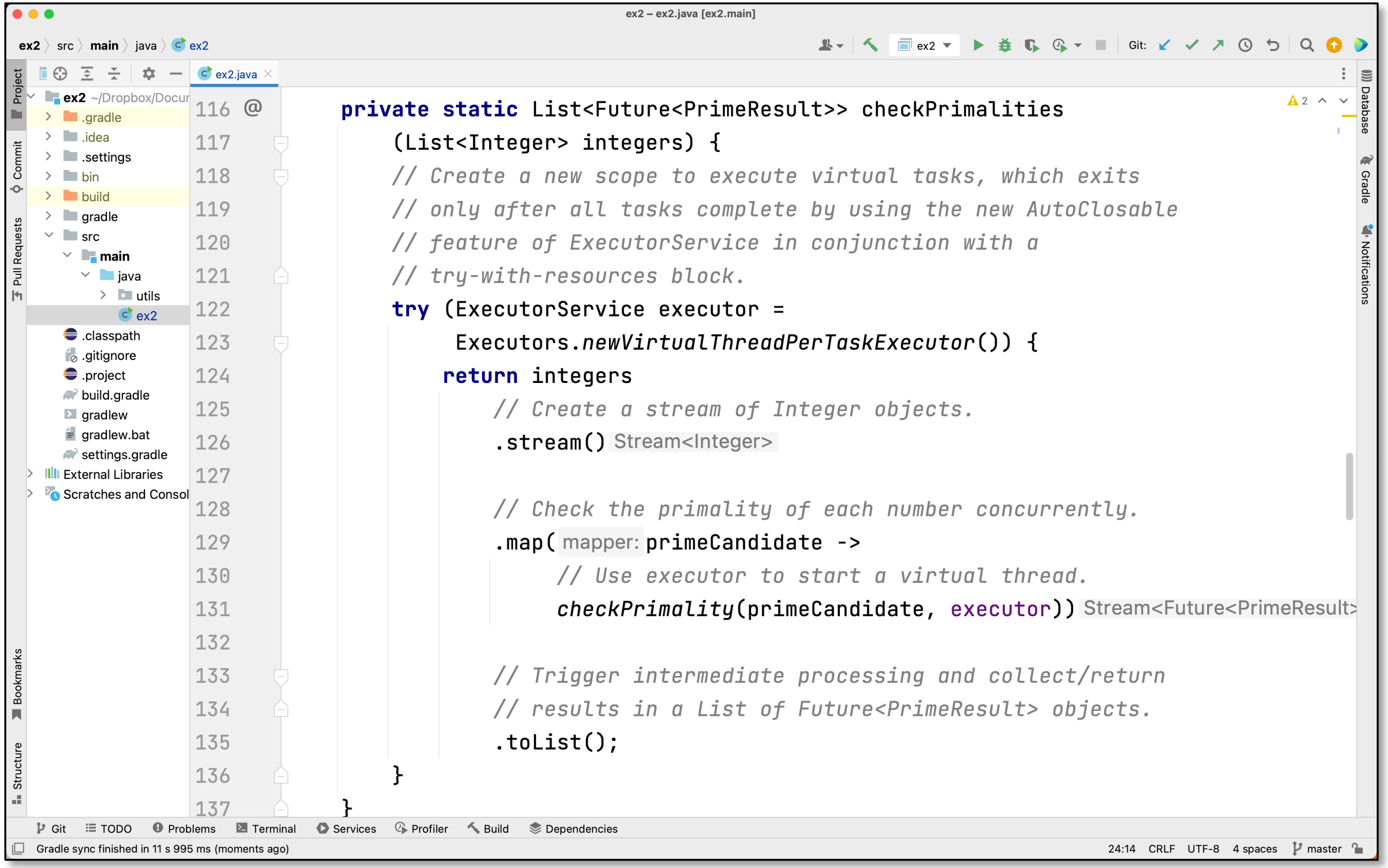

```java
private static List<Future<PrimeResult>> checkPrimalities
    (List<Integer> integers) {
    // Create a new scope to execute virtual tasks, which exits
    // only after all tasks complete by using the new AutoClosable
    // feature of ExecutorService in conjunction with a
    // try-with-resources block.
    try (ExecutorService executor =
          Executors.newVirtualThreadPerTaskExecutor()) {
        return integers
            // Create a stream of Integer objects.
            .stream() Stream<Integer>

            // Check the primality of each number concurrently.
            .map( mapper: primeCandidate ->
                // Use executor to start a virtual thread.
                checkPrimality(primeCandidate, executor)) Stream<Future<PrimeResult>

            // Trigger intermediate processing and collect/return
            // results in a List of Future<PrimeResult> objects.
            .toList();
    }
}
```

See github.com/douglascraigschmidt/LiveLessons/tree/master/Loom/ex2

End of Applying Java Structured Concurrency: Case Study ex2