

Applying Java Futures in Case Study ex16

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Learning Objectives in this Lesson

- Understand the need for the *Future* pattern & Java Future interface
- Recognize the lifecycle of a Future & human known uses of the *Future* pattern
- Know the key methods in the modern Java Future interface
- Learn how to implement a Future via the FutureTask class
- Be aware of how to apply Java futures & active objects to check the primality of BigInteger objects }

```
RunnableFuture<R> makeThreadClosure
(Function<T, R> function,
 T n) {

    mRunnableFuture = new
        FutureTask<R>(() -> {
            return mResult = function
                .apply(n);
        });

    mThread = Thread
        .startVirtualThread
            (mRunnableFuture);

    return mRunnableFuture;
}
```

See en.wikipedia.org/wiki/Active_object

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The screenshot shows an IDE window titled "ex16 - ex16.java [ex16.main]". The code is as follows:

```
49 static public void main(String[] argv) throws Exception {
50     System.out.println("Entering ActiveObjectPrimeTest");
51
52     // Create two random large prime BigInteger objects.
53     var prime0: BigInteger = generateProbablePrime(bitLength: 1024);
54     var prime1: BigInteger = generateProbablePrime(bitLength: 1024);
55
56     // Create a List of two ActiveObjects that concurrently (and
57     // exhaustively) check the primality of large numbers in
58     // background threads.
59     ActiveObjectList primalityChecks = new ActiveObjectList() {{
60         add(new ActiveObject<>(function: PrimeUtils::checkIfPrime,
61                               n: prime0));
62         add(new ActiveObject<>(function: PrimeUtils::checkIfPrime,
63                               n: prime1));
64     }};
```

The IDE interface includes a project explorer on the left showing the file structure: ex16 > main > src/main > java > utils > ActiveObject, PrimeUtils, RSAKeyUtils. The bottom status bar shows "AWS: 2 Connections Expired" and "CodeWhisperer 129:55 (30 chars)".

See github.com/douglasraigschmidt/ModernJava/tree/main/FP/ex16

End of Applying Java Futures in Case Study ex16