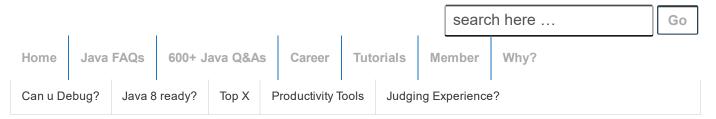
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Home > Interview > Core Java Interview Q&A > Multithreading > 09: Java

FutureTask example

09: Java **FutureTask** example

Posted on May 2, 2015 by Arulkumaran Kumaraswamipillai

Java 5 introduced the concurrent package for more efficient multi-threading.

Q. What is the difference between Future and FutureTask in asynchronous processing?

A. Future is the interface and FutureTask is the base implementation of the Future with methods to start and cancel a computation. The FutureTask provides asynchronous computation with methods to start and cancel a computation, query to see if the computation is complete, and retrieve the result of the computation. The result can only be retrieved when the computation has completed. The get method will block if the computation has not yet completed. Once the computation has completed, the computation cannot be restarted or cancelled.

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Here is an example with 2 tasks. One is an internal short task that takes ~1 second. The second task is an external long running task taking 4 ~ 10 seconds. It is imperative that long running tasks need to have proper processing timeouts.

```
import java.util.concurrent.Callable;
   import java.util.concurrent.ExecutionException;
   import java.util.concurrent.ExecutorService;
import java.util.concurrent.Executors;
   import java.util.concurrent.FutureTask;
   import java.util.concurrent.TimeUnit;
   import java.util.concurrent.TimeoutException;
10 public class FutureTaskExample {
11
12
    // inner class
13
    static class InternalProcess implements Callabl
14
15
     @Override
     public Integer call() throws Exception {
16
17
18
         // just to simulate short internal process
19
         TimeUnit.SECONDS.sleep(1);
20
         return 2;
     }
21
22
23
    }
24
25
    // inner class
26
    static class ExternalProcess implements Callabl
27
28
      @Override
29
      public Integer call() throws Exception {
30
          // just to simulate long running external
31
          TimeUnit.SECONDS.sleep(15);
32
          return 12;
33
      }
34
    }
35
36
    public static void main(String[] args) {
37
      InternalProcess callable1 = new InternalProce
38
      ExternalProcess callable2 = new ExternalProce
39
40
      FutureTask<Integer> futureTask1 = new FutureT
41
      FutureTask<Integer> futureTask2 = new FutureT
42
43
      // create a fixed thread pool with 2 threads
44
      ExecutorService executor = Executors.newFixed
45
      // add future tasks to the pool
46
      executor.execute(futureTask1);
47
      executor.execute(futureTask2);
48
49
      while (true) {
       try {
   if
50
             (futureTask1.isDone() && future
System.out.println("Shutting down the e
51
52
53
             // shut down executor service
54
             executor.shutdown();
55
             return;
56
           }
```

```
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```
58
            //if not done do it once
59
            if (!futureTask1.isDone()) {
60
               // wait indefinitely for future task t
               System.out.println("Task1 output = " +
61
62
63
          System.out.println("Waiting for FutureTask //try the external task with the timeout o
64
65
66
          Integer result = futureTask2.get(5, TimeUn)
67
          if (result != null) {
               System.out.println("Task2 output = " +
68
69
70
71
       } catch (InterruptedException ie) {
72
            ie.printStackTrace();
73
       } catch (TimeoutException e) {
74
          // do nothing as we want to process it asy
75
          // if you want to time out then uncomment
76
          //System.out.println("Cancelling Task2 due
//futureTask2.cancel(true); // true means
77
78
79
       } catch (ExecutionException e) {
80
             e.printStackTrace();
81
82
83
84
85 }
86
```

The output is

```
1
2 Task1 output = 2
3 Waiting for FutureTask2 to complete
4 Waiting for FutureTask2 to complete
5 Waiting for FutureTask2 to complete
6 Task2 output = 12
7 Shutting down the executor.
8
```

If you re-run it by uncommenting the last 2 lines in the TimeoutException catch block, you will get task2 cancelled.

```
1
2 Task1 output = 2
3 Waiting for FutureTask2 to complete
4 Cancelling Task2 due to timeout
5 Shutting down the executor.
6
```

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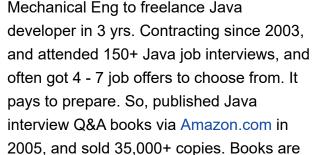
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Mechanical Eng to freelance Java developer in 3 yrs. Contracting since 2003, and attended 150+ Java job interviews, and often got 4 - 7 job offers

to choose from. It pays to prepare. So, published Java interview Q&A books via Amazon.com in 2005, and sold 35,000+ copies. Books are outdated and replaced with this subscription based site.

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