

Problem 1114: Print in Order

Problem Information

Difficulty: Easy

Acceptance Rate: 72.33%

Paid Only: No

Tags: Concurrency

Problem Description

Suppose we have a class:

```
public class Foo { public void first() { print("first"); } public void second() { print("second"); }  
public void third() { print("third"); } }
```

The same instance of `Foo` will be passed to three different threads. Thread A will call `first()`, thread B will call `second()`, and thread C will call `third()`. Design a mechanism and modify the program to ensure that `second()` is executed after `first()`, and `third()` is executed after `second()`.

Note:

We do not know how the threads will be scheduled in the operating system, even though the numbers in the input seem to imply the ordering. The input format you see is mainly to ensure our tests' comprehensiveness.

Example 1:

Input: `nums = [1,2,3]` **Output:** `"firstsecondthird"` **Explanation:** There are three threads being fired asynchronously. The input `[1,2,3]` means thread A calls `first()`, thread B calls `second()`, and thread C calls `third()`. `"firstsecondthird"` is the correct output.

Example 2:

Input: `nums = [1,3,2]` **Output:** `"firstsecondthird"` **Explanation:** The input `[1,3,2]` means thread A calls `first()`, thread B calls `third()`, and thread C calls `second()`.

"firstsecondthird" is the correct output.

****Constraints:****

* `nums` is a permutation of `[1, 2, 3]`.

Code Snippets

C++:

```
class Foo {
public:
    Foo() {

    }

    void first(function<void()> printFirst) {

        // printFirst() outputs "first". Do not change or remove this line.
        printFirst();
    }

    void second(function<void()> printSecond) {

        // printSecond() outputs "second". Do not change or remove this line.
        printSecond();
    }

    void third(function<void()> printThird) {

        // printThird() outputs "third". Do not change or remove this line.
        printThird();
    }
};
```

Java:

```
class Foo {

    public Foo() {
```

```

}

public void first(Runnable printFirst) throws InterruptedException {

    // printFirst.run() outputs "first". Do not change or remove this line.
    printFirst.run();
}

public void second(Runnable printSecond) throws InterruptedException {

    // printSecond.run() outputs "second". Do not change or remove this line.
    printSecond.run();
}

public void third(Runnable printThird) throws InterruptedException {

    // printThird.run() outputs "third". Do not change or remove this line.
    printThird.run();
}
}

```

Python3:

```

class Foo:
    def __init__(self):
        pass

    def first(self, printFirst: 'Callable[[], None]') -> None:

        # printFirst() outputs "first". Do not change or remove this line.
        printFirst()

    def second(self, printSecond: 'Callable[[], None]') -> None:

        # printSecond() outputs "second". Do not change or remove this line.
        printSecond()

    def third(self, printThird: 'Callable[[], None]') -> None:

```

```
# printThird() outputs "third". Do not change or remove this line.  
printThird()
```