Concurrency

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1 How many executions?

1. One thread prints 1 one. Another thread prints 1 two. How many different executions are there?
2. One thread prints 2 ones. Another thread prints 2 twos. How many different executions are there?
3. One thread prints 3 ones. Another thread prints 3 twos. How many different executions are there?
4. One thread prints 1000 ones. Another thread prints 1000 twos. How many different executions are there?
5. One thread executes n instructions. Another thread executes n instructions. How many different executions are there?
6. There are k threads. Each thread executes n instructions. How many different executions are there?

2 State-transition diagrams

Assume that a **`Printer`** prints its name once.

```
public static void main(String[] args) {
  Printer one = new Printer("1");
  one.run();
}
```

Draw the state-transition diagram.

```
public static void main(String[] args) {
  Printer one = new Printer("1");
  Printer two = new Printer("2");
  one.start();
  two.start();
}
```

Draw the state-transition diagram.

3 Counter

Implement the class **`Counter`** with attribute **`value`**, initialized to zero, and the methods **`increment`** and **`decrement`**.

```
public class Counter {




}
```

4 Resource

Implement the class **`Resource`** with attribute **`available`**, initialized to true, and the methods **`acquire`** and **`release`**.

```
public class Resource {




}
```