CyclicBarrier

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`CyclicBarrier` is a synchronization mechanism introduced in JDK 5 in the **`java.util.concurrent`** package. It allows multiple threads to wait for each other at a common point (barrier) before continuing execution. The threads wait for each other by calling the **`await()`** method on the **`CyclicBarrier`**. All threads that wait for each other to reach barrier are called parties.

`CyclicBarrier` is initialized with an integer that denotes the number of threads that need to call the **`await()`** method on the barrier. Second argument in **`CyclicBarrier`**'s constructor is a **`Runnable`** instance that includes the action to be executed once the last thread arrives.

The most useful property of **`CyclicBarrier`** is that it can be reset to its initial state by calling the **`reset()`** method. It can be reused after all the threads have been released.

Lets take an example where **`CyclicBarrier`** is initialized with 3 worker threads that will have to cross the barrier. All the threads need to call the **`await()`** method. Once all the threads have reached the barrier, it gets broken and each thread starts its execution from that point onwards.

```
/**
 * Runnable task for each thread.
 */
class Task implements Runnable {

    private CyclicBarrier barrier;

    public Task(CyclicBarrier barrier) {
        this.barrier = barrier;
    }

    //Await is invoked to wait for other threads
    @Override
    public void run() {
        try {
            System.out.println(Thread.currentThread().getName
() + " is waiting on barrier");
            barrier.await();
            //printing after crossing the barrier
            System.out.println(Thread.currentThread().getName
() + " has crossed the barrier");
        } catch (InterruptedException ex) {
            Logger.getLogger(Task.class.getName()).log(Level.S
EVERE, null, ex);
        } catch (BrokenBarrierException ex) {
            Logger.getLogger(Task.class.getName()).log(Level.S
EVERE, null, ex);
        }
    }

}




/**
 * Main thread that demonstrates how to use CyclicBarrier.
 */
```

```
public class Main {
    public static void main (String args[]) {


        //Creating CyclicBarrier with 3 parties i.e. 3 Thread
s needs to call await()
        final CyclicBarrier cb = new CyclicBarrier(3, new Runn
able(){

            //Action that executes after the last thread arriv
es
            @Override
            public void run(){
                System.out.println("All parties have arrived a
t the barrier, lets continue execution.");
            }
        });

        //starting each thread
        Thread t1 = new Thread(new Task(cb), "Thread 1");
        Thread t2 = new Thread(new Task(cb), "Thread 2");
        Thread t3 = new Thread(new Task(cb), "Thread 3");

        t1.start();
        t2.start();
        t3.start();
    }
}
```

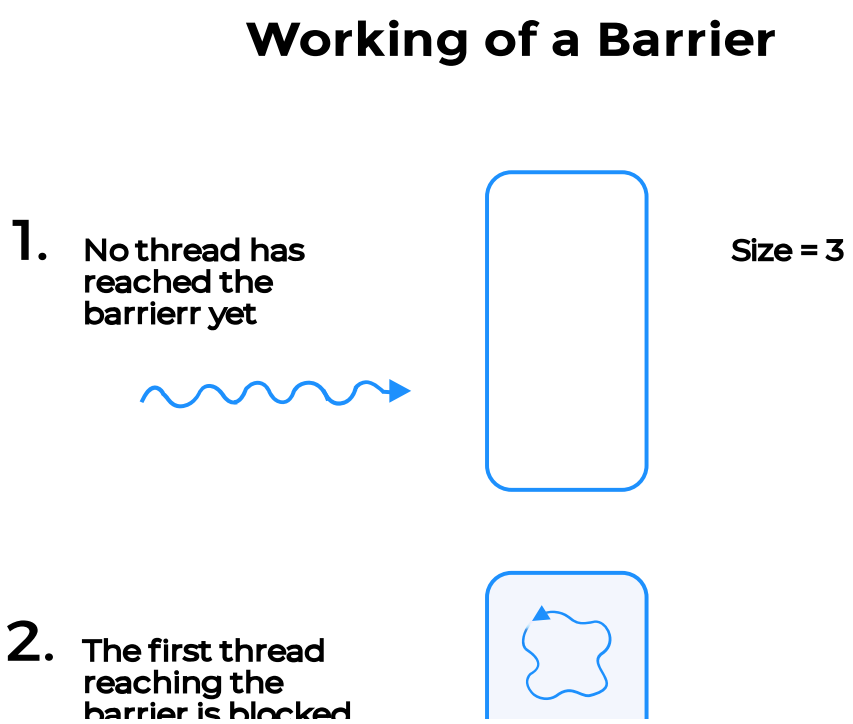
main.java

Task.java

```
1  import ja
2  import ja
3
4  /**
5   * Main tl
6   */
7  public cl
8      publi
9
```

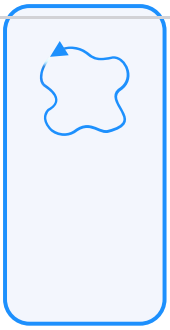
```
10  /
11  f
12
13
14
15
16
17
18
19  }
20
21  /
22  Tl
23  Tl
24  Tl
25
26  t
27  t
28  t
```

A pictorial representation appears below:

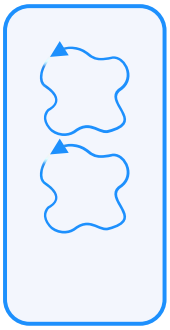


barrier is blocked

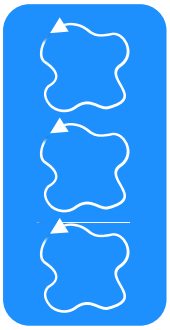
3. A second thread making its way to the barrier



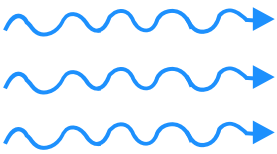
4. Two threads waiting at the barrierr for a third one to arrive



5. All threads reach the barrier



6. The barrier releases all threads

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