Assignment 1

• create MergeSort
  – e.g. for an array of int

• create parallel MergeSort
  – use threads
  – the number of threads is set as a program parameter
    • or use Runtime.availableProcessors()
  – implement directly via threads, and also
    via ForkJoinPool
Assignment 2

• create the class RoundBuffer
  – implements a round buffer with a given capacity (set in the constructor), to which Strings can be stored
  – has at least methods
    • void put(String msg)
    • String get()
  – the buffer can be used by several threads concurrently
  – if there is no space in the buffer resp. no item, then put() resp. get() are blocked

• create a program in which several threads read and write from/to buffer
  • threads sleep randomly between reading/writing
    – for random values see java.util.Random)
Tests...
Test 1

• What is printed out

```java
public class Test01 {
    public static synchronized void main(String[] a) {
        Thread t = new Thread() {
            public void run() {
                pong();
            }
        };
        t.start();
        System.out.println("Ping");
    }
    static synchronized void pong() {
        System.out.println("Pong");
    }
}
```

A  Ping Pong
B  Pong Ping
C  nothing – result in a deadlock
D  throws an exception
E  order of Ping and Pong can be different every time the program is run
Test 2

• What is printed out

```java
class SelfInterruption {
    public static void main(String[] args) {
        Thread.currentThread().interrupt();

        if (Thread.interrupted()) {
            System.out.println("Interrupted: " +
                                Thread.interrupted());
        } else {
            System.out.println("Not interrupted: " +
                                Thread.interrupted());
        }
    }
}
```

A  Interrupted: true
B  Not interrupted: false
C  something else

The example based on code from J. Bloch, N. Gafter: Java Puzzlers