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Department of Computer Science  
COS 226 - Concurrent Systems

Date Issued: 07 November 2021

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## Assignment 2

- **Due Date:** 14 November 2021
- **Assessment:** The assignment will be assessed via live demo.
- This assignment consists of 1 task. Read the task **carefully**!

## 1 Information

### 1.1 Objective

This assignment aims to test the concepts learned so far regarding wait-free concurrency methods.

### 1.2 Provided Code

An example solution to Assignment 1 has been provided. You may use this example solution OR your own Assignment 1 as the basis for this assignment.

## 1.3 Mark Allocation

For the assignment, in order to achieve any marks, the following must hold:

- Your code must produce console output. (As this is not marked by fitchfork, formatting is not that strict)
- Your code must not contain any errors. (No exceptions must be thrown)
- Your code may not use any external libraries.
- Your name and student number **MUST** appear in **EVERY** file you upload.

The mark allocation is as follows:

Task Number	Marks
Implementation	10
Explanation of Code	10
<b>Total</b>	20

## 2 Assignment

For this assignment you are tasked with modifying Assignment 1 so that it uses a wait-free approach to the problem. The following must be followed:

- The specifications from the first Assignment remain the same, however, no blocking methods such as locks may now be used.
- You may use any of the wait-free implementations you have learned so far.
- You may use Java's pre-built **Atomic** classes such as **AtomicInteger**.
- You may use Java's pre-built data structures such as **LinkedList**.

### 2.1 Example Output

...

Thread-4 is ready to wash a car.

Thread-5 is ready to dry a car.

Thread-2 washed Defender for 167 ms. Time remaining: 1081

Thread-2 is taking a break.

Thread-2 is ready to wash a car.

Thread-3 dried Swift for 281 ms. Time remaining: 383

Thread-3 is taking a break.

Thread-0 washed Defender for 270 ms. Time remaining: 811

Thread-0 is taking a break.

Thread-3 is ready to dry a car.

Thread-0 is ready to wash a car.

Thread-1 finished drying Swift

Thread-4 washed Defender for 431 ms. Time remaining: 380

Thread-4 is taking a break.

Thread-4 is ready to wash a car.  
Thread-2 finished washing Defender  
Thread-2 is taking a break.  
...

## 2.2 Notes

- Pay close attention to the example solution.
- It is advised to use the example solution if you did not manage to complete the first Assignment.
- You may modify ANY of the given code, it is merely an example solution to Assignment 1.
- Good Luck!