CSE 332: Data Structures and Parallelism

Exercises (Parallelism)

Directions: *Submit your solutions using gitlab. You* must *fill out the partners form for* para *to get access to your repository. Choosing a partner is disabled, because these exercises are solo.*

EX14. `filterEmpty` (20 points)

Use the `ForkJoin` framework to write the following method in Java:

`public static int[] filterEmpty(String[] arr)`
Returns an array with the lengths of the non-empty strings from `arr` (in order).
For example, if `arr` is `["", "", "cse", "332", "", "hw", "", "7", "rox"]`, then `filterEmpty(arr) == [3, 3, 2, 1, 3]`.

A parallel algorithm to solve this problem in $\mathcal{O}(\lg n)$ span and $\mathcal{O}(n)$ work is the following:

(1) Do a parallel map to produce a bit set

(2) Do a parallel prefix over the bit set

(3) Do a parallel map to produce the output

In lecture, we wrote `parallelPrefix` together, and it is included in the `gitlab` repository. Rather than re-implementing that piece yourself, you should just use it. For the other two parts though, you should write them. Do not bother with a sequential cutoff for this exercise.