One-Day Assignment 5 – algorithmic solution

Assigning Workstations

One-Day Assignment 5 – Pseudocode (English Description)

We use an array(list) of IntegerPairs (or equivalent), to store the arrival time of each researcher, as well as how long they will use a workstation for.

We use two min heaps of integers to keep track of workstations. One min heap is used to keep track of when a workstation will be free for use (changing from “in use” to “unused and unlocked”), while the other is used to keep track of when an unused workstation will relock.

We also use an integer to store the final answer, initialised to 0

One-Day Assignment 5 – Pseudocode (English Description)

Sort the array(list) of IntegerPairs, so we can order the researchers based on who arrives first.

For each researcher that arrives (in chronological order), we do the following:

1. Check the “in use” heap for any workstations that are no longer in use (value in heap <=[1] time researcher arrives). For each such element, remove it from this heap, and add (value + m) to the “unused and unlocked” heap.
2. Check the “unused and unlocked” heap for any workstations that have relocked (value in heap <[1] time researcher arrives). For each such element, remove it from this heap.
3. If any elements remain in the “unused and unlocked” heap, remove the smallest one, and increment the answer by 1.
4. Add (time researcher arrives + time workstation will be used) to the “in use” heap

1. These two signs are different; this is not a typo