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Data Structures & Algorithm

Solutions to Sheet P4

AS 16

Solution P4.1 *Example task: Array maximum.*

The solution was given with the template and has complexity $\mathcal{O}(n)$.

Solution P4.2 *Maximum-sum subarray.*

On the lecture website, you can find cubic $\mathcal{O}(n^3)$, quadratic $\mathcal{O}(n^2)$ and linear $\mathcal{O}(n)$ time solutions, all directly implementing the algorithms from the lecture notes, their source contains further comments. The cubic solution only gets 1 point, the others get full 2 points.

Data:

judge1 The optimal solution subarray started at the first element, $n = 100$.

judge2 The optimal solution subarray ended at the last element, $n = 100$.

judge3 Random numbers $-1000 \dots 1000$ with $n = 1000$.

judge4 Random numbers $-1000 \dots 1000$ with $n = 5000$.

Notes: Some of the solutions skipped the first element of the array $A[0]$, either by starting the for loop over the array at index 1, or by not including $A[0]$ in the partial sums. These then failed test judge1.

Some of you were confused by the first number of input being the length of the array and not an element. Always read the input and output format carefully.