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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

ONE LOVE. ONE FUTURE.

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Applied Algorithm Lab

Max even sub-sequence

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Max even sub-sequence

- Given a sequence of n integers $a_1, \ldots, a_n$.
- A subsequence of a consists of continuous elements of a

  (for example, ai, ai+1, . . . ,aj).
- The weight of a subsequence is defined to be the sum of its elements. A subsequence is called even-subsequence if its weight is even.
- Find the even-subsequence of a having largest weight.

Input

8

4 -5 2 4 -8 2 3 1

Output

6

Max even sub-sequence

- Idea to solve: dynamic programming
- Construct a cumulative array S, where S[i] is sum of from a[1] to a[i].
  - Let f[i][0] be minimal S[j] with 1 <= j <= i and j is even.
  - Let f[i][1] be minimal S[j] with 1 <= j <= i and j is odd.
  - Formula:
    - f[i][0] = min(S[i], f[i – 2][0]), with i is even;
    - f[i][1] = min(S[i], f[i – 2][1]), with i is odd;
- Return:

$$\max_{i:1\to n}(S[i] - f[i][i\ \%2])$$

- Complexity: O(n).

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THANK YOU !