CS 331: Algorithms and Complexity (Spring 2024)

Unique numbers: 50930/50935/50940/50945

Discussion Section: 6

Maximum sum of a substring

We are given a sequence of numbers $A = [a_1, a_2, ..., a_n]$. Now we need to compute the largest sum of a substring. More formally we need to calculate

$$S = \max_{0 \le i \le j \le n} \sum_{k=i+1}^{j} a_k.$$

Note: here a substring can be empty, i.e. $i = j$ in equation above.

Example: $A[1:8]$ = [1, -4, 2, 3, -1, 2, -3, 2], then the maximum sum of substring is $sum(A[3:6])$ = 2+3-1+2 = 6.

Idea to approach:

1. **Brute force.**
2. **Divide and Conquer.**
3. **DP.**