CSE 421 - Lecture 5

Friday, January 12, 2018 2:24 PM

Base Case:

IH: Suppose $x_i, \ldots, x_j$ is the max-sum seq for $x_1 \ldots x_{n-1}$

$x_{lc}, \ldots, x_{n-1}$ is the max-suffix seq

IS: $x_a, \ldots x_b$ is max-sum seq for $x_1, \ldots, x_n$

Case 1 ($b < n$): $x_a, \ldots, x_b$ is also max-sum seq of $x_1, \ldots, x_{n-1}$

Therefore $i=a$, $j=b$. ALG finds OPT.

Case 2 ($b=n$): We claim $x_a, \ldots x_{b-1}$ is the max-suff seq for $x_1, \ldots, x_{n-1}$

If not $x_a + \ldots + x_{n-1} < x_{lc} + \ldots x_{n-1}$

($b-1$)

$x_a + \ldots x_b < x_{lc} + \ldots x_n$

(b = n)

contradiction!

Then $a=k$ the ALG finds the OPT.

IS: $x_a, \ldots, x_n$ is new max-sum suffix

$x_1, \ldots, x_n$

Case 1 (empty seq): implies $x_{lc} + \ldots + x_n < 0$

ALG works correctly

Ca 2 (non-empty): Claim $x_a, \ldots, x_{n-1}$ is the max-sum suffix of $x_1, \ldots, x_{n-1}$

If not $x_{lc} + \ldots x_{n-1} + x_n > x_a + \ldots x_{n-1} + x_n$

Contradiction - $lc = a$

ALG finds max-sum-suffix.