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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Applied Algorithm Lab

Disjoint segment

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Disjoint segment

- Find maximal number of disjoint segments from a given set.
- **Input:** A line and a set of segments on the line:

$$X = \{(a_1, b_1); \dots; (a_n, b_n)\}, \text{where } a_i < b_i$$

- **Objective:** Find a subset of X containing disjoint segment and largest cardinality
- **Output:** the largest cardinality found

Disjoint segment

- Example

stdin	stdout
6 0 10 3 7 6 14 9 11 12 15 17 19	4 Explain: (3,7), (9,11), (12,15), (17,19)

Disjoint segment

- Idea to solve: use greedy approach
  - **Observation**
    - Choose from left to right: prioritize the interval that ends earliest → this "saves space" for later intervals.
    - Sort the intervals in ascending order of their end time.
    - Traverse through the intervals and check if an interval satisfies the condition; if yes, add it to the subset.
  - **Auxiliary variable**
    - last: stores the end point of the previously selected interval.
  - **Selection condition**
    - An interval is selected if begin > last.

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THANK YOU !