## Week 6: Orthogonal segment intersection

The problem: Given a set $S$ of $n$ segments in the plane, find all their pairwise intersections.

## Class work

1. Output size: As usual, we denote by $k$ the size of the output (in this case, the number of intersections). Give an upper bound and lower bound for $k$ and draw examples that illustrate these bounds.
2. When is the naive algorithm efficient? When is the naive algorithm inneficient (on what sorts of inputs)?

Consider the set $S$ of 6 segments shown in the picture below.


Simulate the algorithm for finding the intersections of S : Show the events in order in which they are processed, the operations they trigger, and the active structure (AS). If the operation is a RangeSearch, list the intersections found.

| Event | Operation triggered | AS |
| :---: | :---: | :---: |
| initially |  | $\}$ |
| c.start | INSERT ( c ) | $\{c\}$ |
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