Final Exam:
- Friday, May 13, 4-6 pm
- Tydings Hall 0130
- Far away from our classroom!
- 14 minute walk
- Closed book/Closed notes
- 3 sheets of notes (front + back)

Similar structure:
- Work through example(s)
- Short answer
- Pseudo code
- Analysis/Proof

- Bring your ID/masks
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$S = baabaababaabaa$
3(a) Platform Dropping

Preprocessing

2 layer

Space:
Main: \( O(n) \)
Aux: \( O(n \log n) \)

Query

\[ \text{sort by } y \]

\[ \text{findDown}(y_0) \]

\[ \text{return max over all} \]

\[ \text{findDown}(q_y) \]
3(b): Max Empty Triangle

Preprocess

3-layers

Space: $O(n \log^2 n)$

Query:

Layer 1: Filter pts $x \geq q_x$

Layer 2: Filter pts $y \geq q_y$

3: $\text{findUp}(q_x + q_y)$

Time: $O(\log^3 n)$

Layer 1: Filter $p_i = (x_i, y_i)$

Layer 2: Filter $\hat{p}_i = (x_i, y_i, x_i + y_i)$

filter $\text{findUp}$
CMSC 420 - Overview:

Data Structures:
- General structures (stack, queue, deque, multi-list.)
- Dictionaries:
  - Ordered: (Search Trees)
    - unbalanced
    - balanced
      - Worst-case
        - AVL
        - 2-3/AA-tree
    - Randomized
      - Treap
      - Skip list
    - Amortized
      - Splay (self adj.)
      - Scapegoat
  - Unordered
    - hash table

- Priority Queues
  - Quake Heap

- Geometric
  - Quadtree
  - kd Tree
  - range Tree
  - Query processing

- Digital
  - trie + Patricia
  - suffix trees

- Memory Management
  - unstructured
  - buddy system

Tools:
- Amortized analysis
  - resizeable
  - scapegoat
  - rehashing

- Probabilistic analysis
  - binary trees
  - skiplists
  - treaps

- Recurrences + summations
  - range searching
  - tree size