final review

DECEMBER 9, 2002
Final exam

| wed 9 | thu 10 | fri 11 | sat 12 | sun 13 | mon 14 |

handed out 10p
due 10p

closed book: no aids, notes, internet, colleagues, etc.

Applies once you D/L the exam.
WHOLE IS GREATER THAN SUM OF PARTS
\[ \Theta(n^3) \quad \Theta(n^2) \quad \Theta(n) \]

- gong pence maker
- matrix chain
- tig fawr
- DSM mashup
- Binary variables

\[ O(n^3 m^d) \]

- log cutting
- ZAP fence (lost)
- Typesetting
- fill

\[ \text{Best}_{pos_i} = \max \left\{ \text{Best}_{pos_{i-1}}, \text{Best}_{pos_{\text{buddy}(i)}} + V_i \right\} \]
WHOLE:

\[ O(n^c m^d) \quad \Theta(n^3) \quad \Theta(n^2) \quad \Theta(n) \]

- gerry
- matrix chain
- posters
- seam carving
- typesetting
- monotonicity
- zap
- tug
- shortest paths
- Bellman-Ford
- Floyd-Warshall
- \( \text{shortest } i, j, k \)
exchange 5 contradiction

- Scheduling (earliest deadline first)
- Caching
- Barista HW for exam
- Huffman Coding
- Diskvarta
- Min spanning trees

STABLE MATCHINGS
<table>
<thead>
<tr>
<th>methods</th>
<th>applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ford-Fulkerson</td>
<td>- Bipartite matching</td>
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<tr>
<td>Edmonds-Karp</td>
<td>- Edge/Node disjoint paths.</td>
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REDUCTIONS

$\Rightarrow$ NP-completeness.

1. Not knowing what to show
2. Show the opposite

"Show that $X$ is NP-complete."

$X \leq_p 3SAT$

$3SAT \leq_p X$

3. $x \in 3SAT \iff f(x) \in X$.
4. Argue that $X \in \text{NP}$.
0. NPC
1. Short Answer
2. Graph

1. ???

1. Greedy
2. DP
3. DC.