Summary

- Topics
- Criteria
- Everything Else
- AI
- Break
- Evaluation

Wildcard Topic
## What We’ve Covered

<table>
<thead>
<tr>
<th>Week</th>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Book</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Jan 26</td>
<td>intro, big-O</td>
<td>2, 3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Jan 31</td>
<td>linear sorting</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Feb 2</td>
<td>quicksort, heaps</td>
<td>6</td>
<td>asst 1 (sorting)</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Feb 7</td>
<td>hashing</td>
<td>11</td>
<td>asst 2 (quicksort)</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Feb 9</td>
<td>binary trees</td>
<td>12, 13</td>
<td>asst 3 (babbler)</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Feb 14</td>
<td>red-black trees</td>
<td>12</td>
<td>asst 4 (I/O scheduling)</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Feb 16</td>
<td>red-black deletion</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>Feb 21</td>
<td>tries</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>Feb 23</td>
<td>dynamic programming</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>Feb 28</td>
<td>knapsack</td>
<td></td>
<td>asst 5 (spelling correction)</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>Mar 2</td>
<td>parsing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>Mar 7</td>
<td>greedy</td>
<td></td>
<td>asst 6 (sequence alignment)</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Mar 9</td>
<td>Midterm Exam (in class)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Mar 13–19</td>
<td>spring break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>Mar 21</td>
<td>graph traversal</td>
<td>22</td>
<td>asst 7 (parsing)</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>Mar 23</td>
<td>union-find, components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>Mar 28</td>
<td>spanning trees</td>
<td></td>
<td>asst 8 (algorithm design)</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
<td>Mar 30</td>
<td>shortest paths</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>Apr 4</td>
<td>all pairs paths</td>
<td>24</td>
<td>asst 9 (MST halftoning)</td>
</tr>
<tr>
<td>11</td>
<td>18</td>
<td>Apr 6</td>
<td>network flow</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>19</td>
<td>Apr 11</td>
<td>matching</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>20</td>
<td>Apr 13</td>
<td>NP-completeness</td>
<td>26, 3</td>
<td>asst 10 (route planning)</td>
</tr>
<tr>
<td>13</td>
<td>21</td>
<td>Apr 18</td>
<td>satisfiability</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>22</td>
<td>Apr 20</td>
<td>clique</td>
<td></td>
<td>asst 11 (NP proof)</td>
</tr>
<tr>
<td>13</td>
<td>23</td>
<td>Apr 25</td>
<td>undecidability</td>
<td></td>
<td>asst 12 (NP proof)</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Apr 27</td>
<td>approximation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>May 2</td>
<td>backtracking</td>
<td></td>
<td>asst 13 (algorithm design)</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>May 4</td>
<td>wildcard slot</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>
How to Choose an Algorithm

- running time
- memory use
- solution quality (for optimization problems)
- guarantees on time, memory, or cost
- implementation complexity
  - correctness
  - ease of testing
  - time to write
  - ease of maintenance

- generality
- popularity
  - ease of maintenance
  - correctness

- input required
Everything Else

- topics
  - geometry
  - strings
  - linear programming
  - cryptography
  - numerical analysis
  - FFT

- approaches
  - randomized algorithms
  - on-line algorithms
  - parallel, distributed
  - external memory, cache-oblivious
  - models: quantum, DNA
Artificial Intelligence

- CS 730/830 Introduction to Artificial Intelligence
  spring, Wheeler Ruml
- CS 780/880 Introduction to Machine Learning
  spring, Marek Petrik
- CS 780/880 Introduction to Mobile Robotics
  spring, Momotaz Begum
- CS 780/880 Introduction to Information Retrieval
  fall, Laura Dietz
- CS 980 Planning for Robots
  fall, Wheeler Ruml

And the UNH AI Research Group meets weekly all year round

Google “UNH AI Group” for details
Break

Summary

- Topics
- Criteria
- Everything Else
- AI

Break

- Evaluation

Wildcard Topic

- final exam: Tues May 16 1-3pm, Kingsbury N133
- no books, notes, gadgets, ...
We do read these (and so does my boss).

A. Class
1. Things you liked
2. Suggestions for improvement

B. Wheeler Ruml
1. Things you liked
2. Suggestions for improvement

C: Bence Cserna
1. Things you liked
2. Suggestions for improvement

Duplication from CS 515? Background assumed?
How to make class appropriate for juniors?
Advice for students next year?
Wildcard Topic
Nope!