Exam 1 Review

CS 2308
Spring 2015
Jill Seaman

Exam 1

- Friday, February 20
- In class, closed book, closed notes, clean desk
- 15% of your final grade
- 50 minutes to complete it
- I recommend using a pencil (and eraser)
- All writing will be done on the test paper I will hand out.
- No calculators or cell phones.

Exam Format

- 100 points total, 4 (or 5) pages
  - Writing functions/code (about 1 page)
  - Multiple choice/matching
  - Fill-in-the-blank/short answer
  - Demonstrating the search/sort algorithms

Content from Textbook

- Chapter 6:  6.1-5, 7-10, and 13
- Chapter 7:  7.1-4, 6, and 8
- Chapter 11: 11.2-8
- Chapter 8:  8.1 and 8.3
- Linux material from the Linux lecture.

- see lecture pdfs for specific topics:
  Review part 2, Linux, Chapter 8
C++ Programming on Linux

- What is Linux
- Linux file system
- Basic shell commands

<table>
<thead>
<tr>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pwd</code></td>
</tr>
<tr>
<td><code>ls</code></td>
</tr>
<tr>
<td><code>cd</code></td>
</tr>
<tr>
<td><code>mkdir</code></td>
</tr>
<tr>
<td><code>rmdir</code></td>
</tr>
</tbody>
</table>

- Basic file editing (nano, etc.)
- `nano`
- `g++`
- `./a.out`

- `edit, compile, run`
- know how to use the commands

Chapters 6, 7, 11 Review

- Know how to program with functions, arrays and structures.
- Passing parameters by reference and by value
- Passing arrays to functions, processing arrays
- Partially filled arrays
- Arrays of structures
- Everything from PA1 and PA2

Ch.8: Searching and Sorting Arrays

- Searching
  - Linear Search
  - Binary Search
- Sorting
  - Bubble Sort
  - Selection Sort
- Efficiency
  - Growth rate functions: which are faster/slower
  - Efficiency of each searching/sorting algorithm

Example Programming Problem

Write a function that accepts an array of integers and the size of the array and prints out a table listing how many values in the array fall in each of the following ranges:

- less than 50
- 50 to 59
- 60 to 69
- 70 to 84
- 85 to 99
- over 100

You will not need to know the code
--but I may ask you to implement linear search

You will need to be able to demonstrate the algorithms
--see exercises at end
**Binary Search**

**Example**

The target of your search is 101. Given the following list of integers, record the values of first, last, and middle during a binary search. Assume the following numbers are in an array:

1 7 8 14 20 42 55 78 101 112 122 170 179 190

Repeat the exercise with a target of 114

<table>
<thead>
<tr>
<th>first</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>last</td>
<td>14</td>
</tr>
<tr>
<td>middle</td>
<td>7</td>
</tr>
</tbody>
</table>

**Sorting**

**Example**

Use the following array for both questions:

<table>
<thead>
<tr>
<th>11</th>
<th>8</th>
<th>14</th>
<th>7</th>
<th>12</th>
<th>18</th>
<th>2</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Show the contents of the array after 2 passes of the selection sort

Show the contents of the array after 1 pass of the bubble sort

**How to Study**

- Review the slides
  - understand all the concepts, quiz yourself
- Use the book to help understand the slides
  - there will be no questions over material (or code) that is in the book but not on the slides
- Review programming assignments (fix yours!)
  - get printouts of solutions in my office
- Try some exercises from the book
- Practice, practice, practice!
- Get some sleep