Lecture - CS163

Bring Picture ID!

1) Prep for the midterm
2) Examine a midterm exam
3) Review Practice Questions

* The exam is closed book/closed notes
* It will contain:
  - Programming questions (CH & data structures)
  - Short answer
  - Multiple choice & True False
* Bring - Pencil(s) & Erasers!
* Today is the only lecture where we will talk about the exam. {new material next time}

Topics to Study for the Midterm

ADT

- what is an ADT
- Data Structures vs Abstract Data Types
- Absolute & Relative Ordered Lists
- Stacks & Queues

Data Structures

- LLL, CLL, DLL, Arrays
- "Flexible" Arrays (Linked List of Arrays)

Recursion!

Practice:

LLL, CLL, DLL

- Add a node at the beginning
- Add a node at the end with a tail pointer
- Add a node at the end without a tail pointer
- Remove a node at the beginning
- Remove a node at the end
- make a complete copy of a LLL and create a new LLL
- Do the same for a CLL or DLL
- Copy the contents of a LLL and place it in an array
- copy an array and place it in a LLL
- show the code to connect up a node in a DLL

Rules

1. closed book, closed notes
2. 1 hr 50 min
3. 3-4 pages
4. short answer & coding
5. Pencil(s) & Eraser(s)
6. Bring Picture ID

Recursion_insert_a.cpp

```cpp
#include <iostream>
using namespace std;

//return true if 'a' is inserted EVER
//false otherwise
int insert_a(node * & head)
{
  int count=0;
  if (!head)
     return 0;
  if (head->data == 'b')
  {
      node * temp = head;
      head = new node;
      head->data = 'a';
      head->next = temp;
      count = insert(temp->next) +1;
  }
  else
      count = insert_a(head->next);
  return count;
}
```