Computer Science 205
Review Sheet for Exam #3
Friday, November 18th

Exam #3 will focus on linked list structures, stacks, and queues. The labs that are covered are Labs #9 – #12.

Look back over Quiz #3 and your labs and class worksheets for some good review questions. Listed below are the important terms and concepts covered on the exam. The exam will be of the same format as the last exam. It will consist of short answer questions and short definitions, valid/invalid statements, tracing code, writing short code segments and declarations, and writing one complete class method that uses the Stack ADT as well as an instance method for a stack class.

Linked Lists

- What is a linked list? What items is it always made up of?
- Be able to print out and count the number of items in a linked list
- Be able to insert new items into a linked list
- Be able to delete items from a linked list
- Be able to compare and contrast arrays and linked lists
- The role of the copy-constructor clone method; the dangers of not including it within a class that manipulates dynamic data; the differences between a deep copy (clone) and a shallow copy (alias)
- Know what lines of code like the following represent:
  - `p.getNext().getNext() == q`
  - `p.getNext().setItem(q.getItem())`
  - `p.getNext() == q`
- What is a "memory leak"? How is garbage collection of memory handled in Java?

Stacks and Queues

- Definition of both and what distinguishes them
- LIFO vs. FIFO
- Be able to name some applications of a stack and queue
- Be able to trace through a program which uses the methods of a stack or queue class
- Be able to write class methods for a driver program which needs to use the methods of a stack or queue class
- What are the two main ways a stack class can be implemented?

- Be able to write instance methods for a linked list implementation of a stack (see `findMax` instance method from Lab #11)
- What are the two main ways a queue class can be implemented? How does a circular array work? Be able to trace through some code which uses a circular array.

Computer Science 205 Exam #3

Answer Sheet

Fall 2016

Friday, November 18th

100 points

Name : Y. Ching

peeps(5)

56/100

1. 5 Peeps
4 Peeps
3 Peeps
2 Peeps
3 Peeps
4 Peeps
5 Peeps

par 5 Peeps
peeps(5-1)
4 Peeps
peeps(4-1)
3 Peeps
peeps(3-1)
2 Peeps
return

2. A linked list is not advantageous to use over an array when you are searching for an element in a linked list. The advantages to use a linked list is when the application size is varying, easy to insert/delete elements at end of linked list and easy to search for the first element.

3. (a) False true
(b) 60
(c) 0 null
(d) 7 u

-6

4. (a) listData.getNext().getNext().getNext().getNext().getNext().getNext()
setNext(listData).getNext().setNext(listData)

(b) listData.getNext(listData - 1) getItem()
setItem

-2

(c) listData.getNext().getNext().getNext().setNext(ptr1)

-3

ptr1 =

-11

5.
```
public static void size(Node head){
int size = 0;
if(listData != null){
    size++;
}
return size;
}
```

(Node head)

recursion??

1 + size(head.getNext())

else return 0

-8

6. (a) 80

(b) ~~90~~ null

-2

7.
```
Node number = new Node(10);
number.setNext(listData);
number = listData;
```

-1

8. (a) Queue

(b) Queue

(c) Stack

(d) list

(e) list

(f) Queue

(g) Stack

(h) Stack

Stack - Last in, First out

Queue - First in, First out

✓

-11

a = A

b = B

b = A

9.

A

A

A

B

C

D

Console : A C D B A A

10. (a)

A

A

A

B

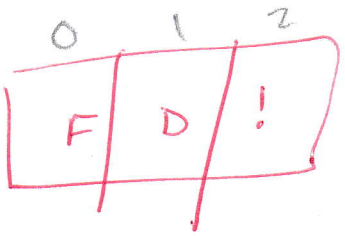
C

D

!

F

-2



f	b	s
0	0	1
0	1	2
0	2	2

(b)

Front = 1 2

Back = F 0

-2

Size = 2

11. The clone method is a deep copy.

It is used so a new instance method called clone can take a copy of the and manipulate it and not worry about destroying the original

-4

push
pop
top

12. private static void removeBottom (Stack s)
{

```
Stack s = null;
s.push()
if(s != null) {
    s.pop;
}
System.out.println(s)
```

← no linked list.

-9

}

13. public void removeBottom()
{

```
Stack top = null;
Stack temp = null;
temp = (Stack).clone(top);
temp.pop;
return temp;
```

implement Stack linked list deep copy

need to set next to last to null

-9

}

-1