Ximan Liu HW5 - CSC402

1. (1.3.19)

first → □ → 

```
public void deletel() {
    Node tmp = null;
    for( tmp = this.first; tmp.next.next != null; tmp = tmp.next){
}   tmp.next = null;
}
```

2. (1.4.5).

a. $(N)+1 \sim N$

b. $(1)+1/N \sim 1$

c. $(1+1/N)(1+2/N) = (\frac{2}{n^2}+\frac{3}{n}+1) \sim 1$

d. $(2N^3)-15N^2+N \sim 2N^3$

e. $lg(2N)/lgN \Rightarrow \frac{lg2+lgN}{lgN} = \frac{lg2}{lgN}+1 \Rightarrow \sim 1$

f. $lg(N^2+1)/lgN \Rightarrow \frac{lgN^2}{lgN} = 2\cdot\frac{lgN}{lgN} = 2 \Rightarrow \sim 2$

g. $N^{100}/2^N$ ∵ N will go to infinity ∞, ∴ ~0

3. (1.4.6)

a. sum = $N+\frac{1}{2}N+\frac{1}{4}N+\cdots+1$; if N%2==0, sum = N−1 $\sim N$

b. sum = $1+2+\cdots+\frac{1}{2}N$; if N%2==0, sum = $\frac{N}{2}-1$ $\sim N$

c. ~ (N * logN)

CSC 402 SP19 Homework 5 name Ximan Cui

Write the answers to these problems on paper. Scan the paper and upload to the submissions folder.
We will grade a random subset of these for credit.

1. 1.3.19 (You may assume the list has at least one node).

2. 1.4.5 (show your work)
3. 1.4.6 (it might help to try some small values of N – see if you see a pattern.

4. Review the Java program on the next page.

Carefully compare the two functions: addTwoIntsNtimes, addThreeIntsNtimes and review how they are called from main.

Answer the three questions Q1, Q2, Q3 in the comments in the main function.

Q1. ~~time1~~ The average time to run addTwoIntsNtimes(reps), when reps=10000, time1 (as known as average time) is 6.0E-7;

Q2. ~~time2~~ The average time to run addThreeIntsNtimes(reps), when reps=10000, time2 (average time) = 2.0E-7;

Q3. ~~diff~~ The difference of average time to run two functions, when reps=10000, diff = -4.000000e-07

5. Create a java program with this class and run it using the values in the table below. (You will need to change the value of the variable *reps* in the program). Record the value printed in the table.

Reps	Printed value of diff
10000	-3.000000e-07
100000	-2.000000e-08
1000000	~~-6.000000e-09~~ 1.000000e-09
10000000	1.900000e-09
100000000	~~-2.760000e-09~~ 2.610000e-09
1000000000	5.790000e-09

Vers 1.0

- Over -