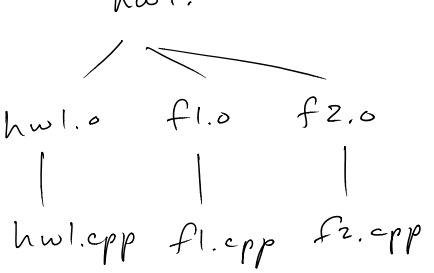
Exam 1: Monday

NO TREES !

Distance — Exam will be open 8PM monday evening

- Allow page of notes
- Calcs allowed

Basic Unix / Makefile



Difference between Java - C++

I/O C++

Parameter Passing value vs reference

```
void fun (int x, int &y, int z)
{
    x = y + z;
    y = x * z;
    z++;
}

x = 10;
y = 20;
z = 30;
fun (10, 10, z);
  x -  y -  z -
```

program layout

.h , .cpp

classes in C++

Basic

pseudo Java

Array → ArrayList

stack — stk s

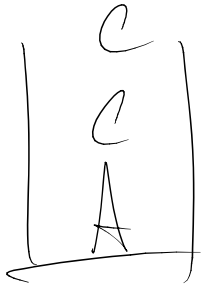
Queue — s.push(A)

Lists — s.push(B)

s.pop()

s.push(c)

s.push(s.top())



(1) - piece of code
- picture list
- whats the output

② Add number function to your list class

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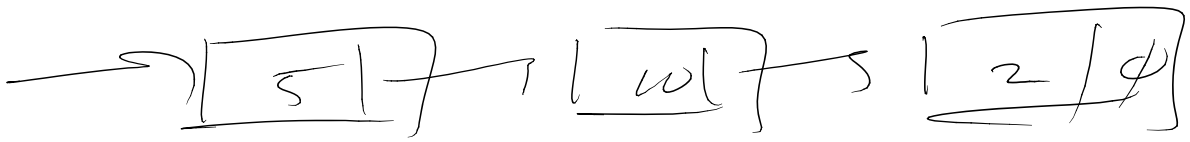
① print every kth node

② remove every kth node

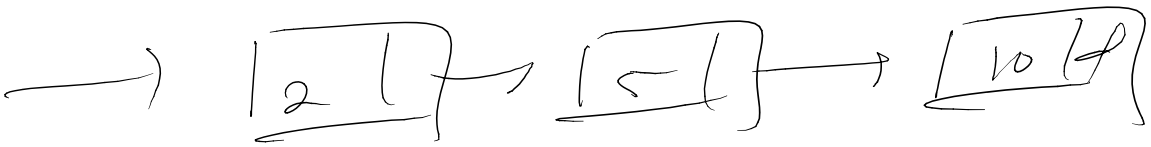
③ Append lists

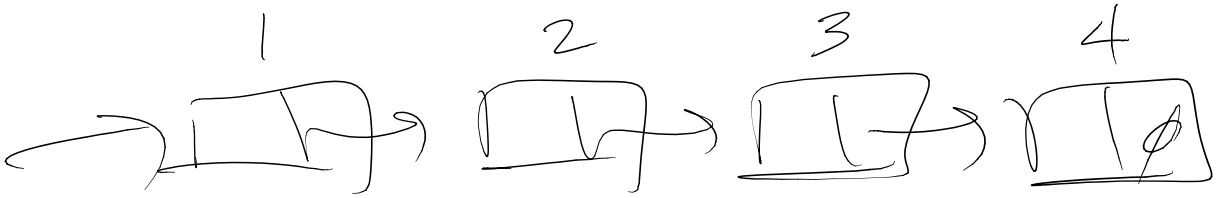
④ Make circular

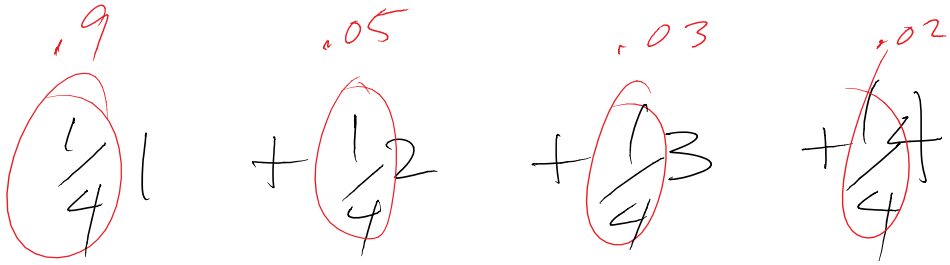
⑤ Make an adaptive search



And(2)







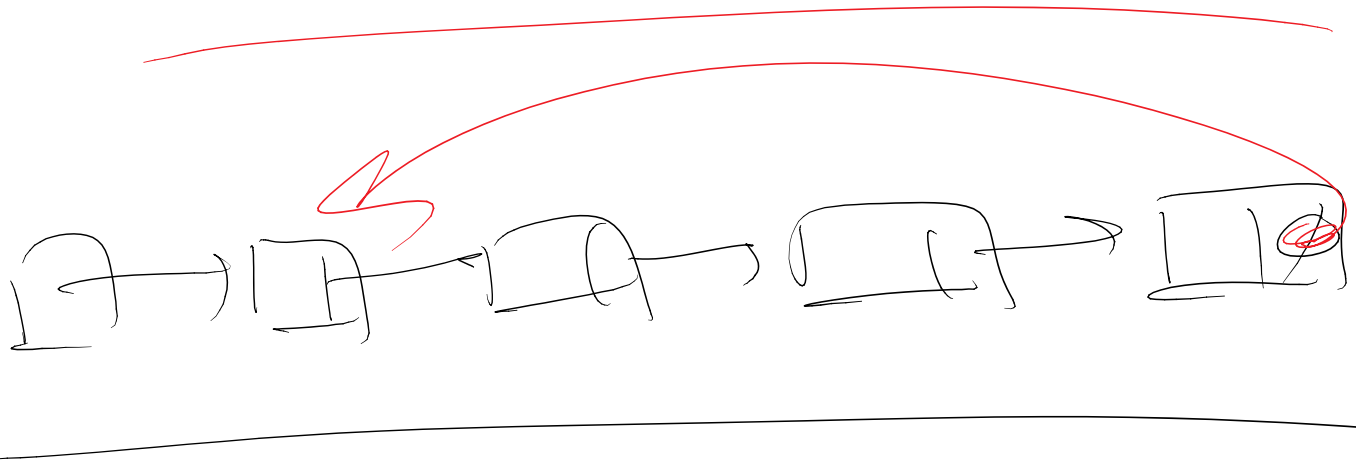
≈ 2

void append(list & L2);

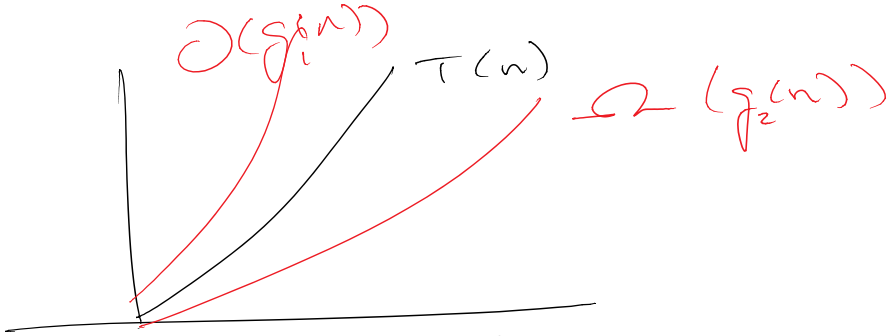
---

this 

L2 



$$T(n) = 3n^2 + 5n + 2$$



Defn $T(n) = O(g(n))$ iff

$$T(n) \le c \cdot g(n)$$

$c > 0$; $n \ge n_0$

$$3n^2 + 5n + 2 \le c \cdot n^2 \qquad n_0 = 3$$

n	$3n^2+5n+2$	$c=2$	$2n^2$	$c=10$	$10n^2$
1	9		2		10
2	24		8		40
3	45		18		90

$n = 3$ 45

n_0

$2^4 > 7$ 1'

$$3n^2 + 5n + 2 = O(n^3)$$

$$= O(n^2)$$

$T(n) = \Omega(g(n))$ iff

$T(n) \geq c \cdot g(n)$

$n \geq n_0$ and $c > 0$

$T(n) = 3n^2 + 5n + 2$

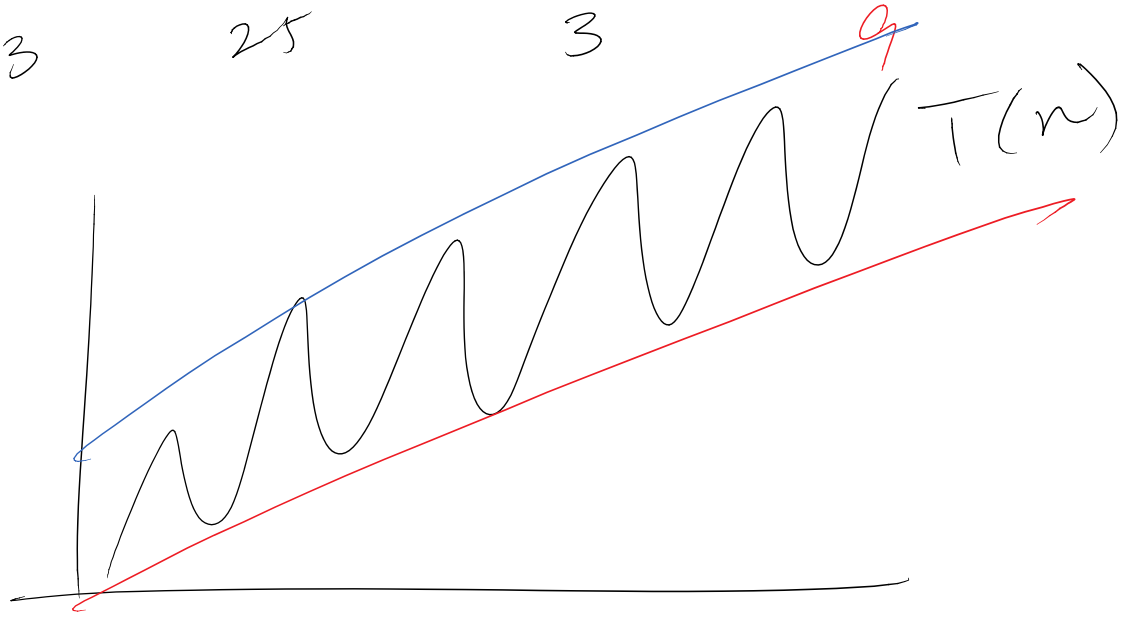
$= \Omega(n) = \Omega(n^2)$

$3n^2 + 5n + 2 \geq cn$

$c = 1 \quad n = 1$

n	$T(n)$	$g(n)$	n^2
1	9	1	1

1	9	1	1
2	24	2	4
3	25	3	9



$$T(n) = 3n^2 + 5n + 2 = \Theta(g(n))$$

$$c_1 \cdot g(n) \le T(n) \le c_2 \cdot g(n)$$

$$= \Theta(n^2)$$

$$\frac{1}{c_1} \frac{n^2}{n^3} \le 3n^2 + 5n + 2 \le \frac{5}{c_2} \cdot \frac{n^2}{n^3}$$

$$n \ge n_0$$