Lecture 7   Mar 22. 2023

✓ Test #1   Mar 8th

✓ Spring Break   Mar 15th

   Test #2   Apr 12th

   Test #3   Apr 26th

90 — 100   A

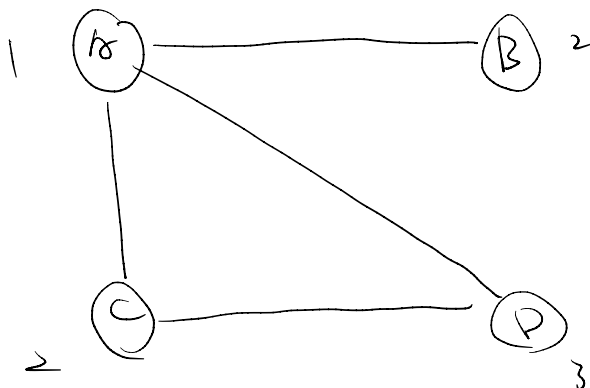87 — 90   A⁻

83 — 87   B+

74 — 85   B

69 — 74   B⁻

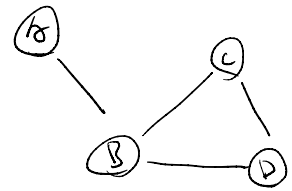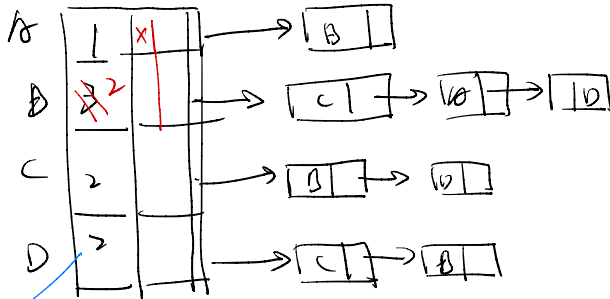64 — 69   C+

50 — 64   C

30 — 50   C⁻

30 — 0   ....

Project:

ordering
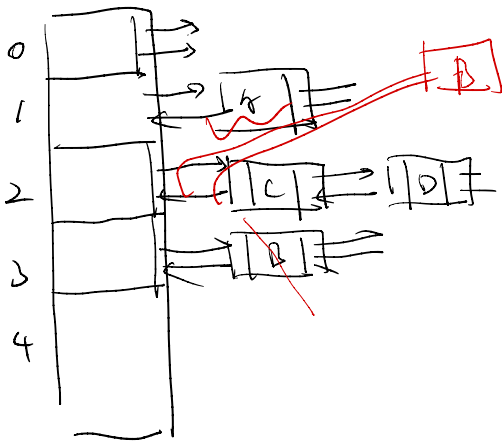
coloring based on the order

$\theta(v+\varepsilon)$

adjacency list

It's an array of structures. One of the members of the structures is the head pointer for linked list.
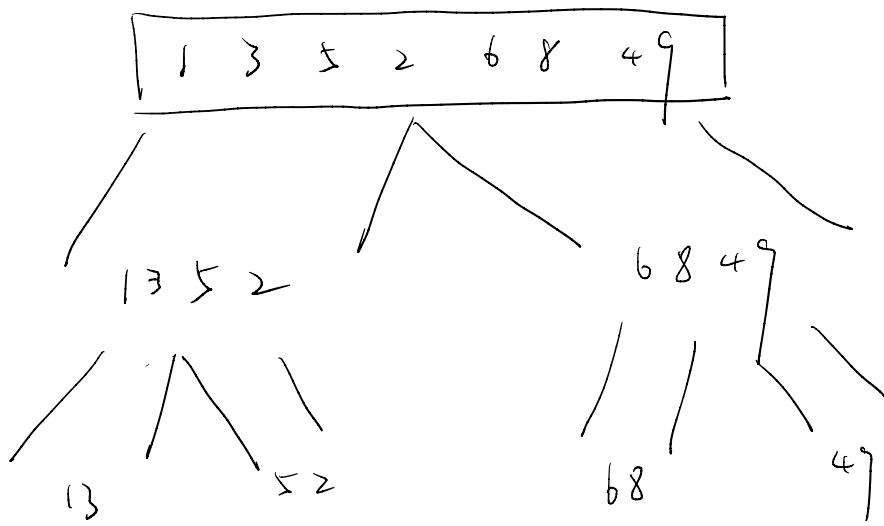
you're really going to want to remember the degree.

Degree

The smallest last vertex order.

Degree

double linked list.

$$\boxed{1 \quad 3 \quad 5 \quad 2 \quad 6 \quad 8 \quad 4 \quad 9}$$

divide
and
conquer

$1 \ 3 \ 5 \ 2$

$6 \ 8 \ 4 \ 9$

$1 \ 3$

$5 \ 2$

$6 \ 8$

$4 \ 9$

$5+3$

$f(x)$	1	1	2	3	5	8	13	21	34

$f(x) = O(1.6^n)$ $O(2^n)$

$f(x) = f(x-1) + f(x-2)$

$f(x) = \boxed{f(x-2)} + f(x-3) + \boxed{f(x-2)}$

$f(n) = f(n-1) + f(n-2)$

fib (n) {

     if n == 1   or   n == 0
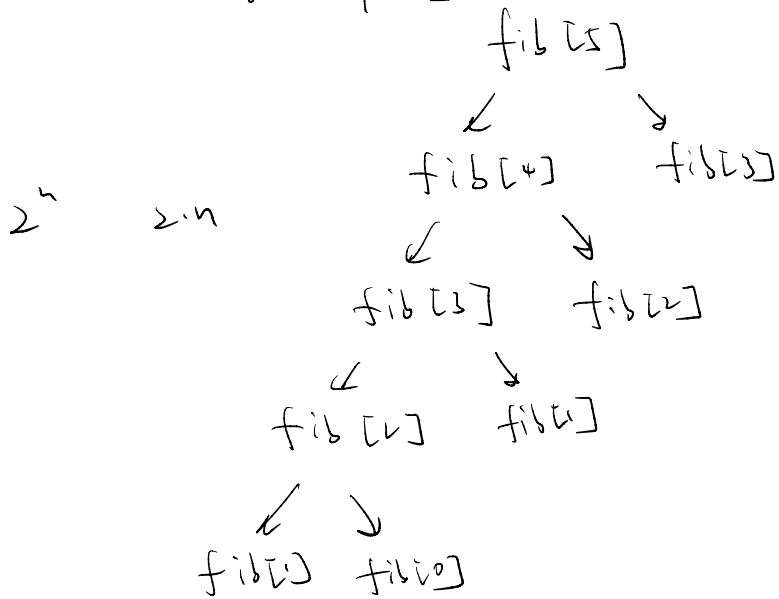
        return 1

     return fib (n-1) + fib (n-2)

}

$f(5)$

$f(4)$

$f(3)$

$f(3)$

$f(2)$

$f(1)$

$f(2)$

$f(1)$

$f(1)$

$f(0)$

$f(2)$

$f(1)$

$f(1)$

$f(0)$

$f(1)$

$f(0)$
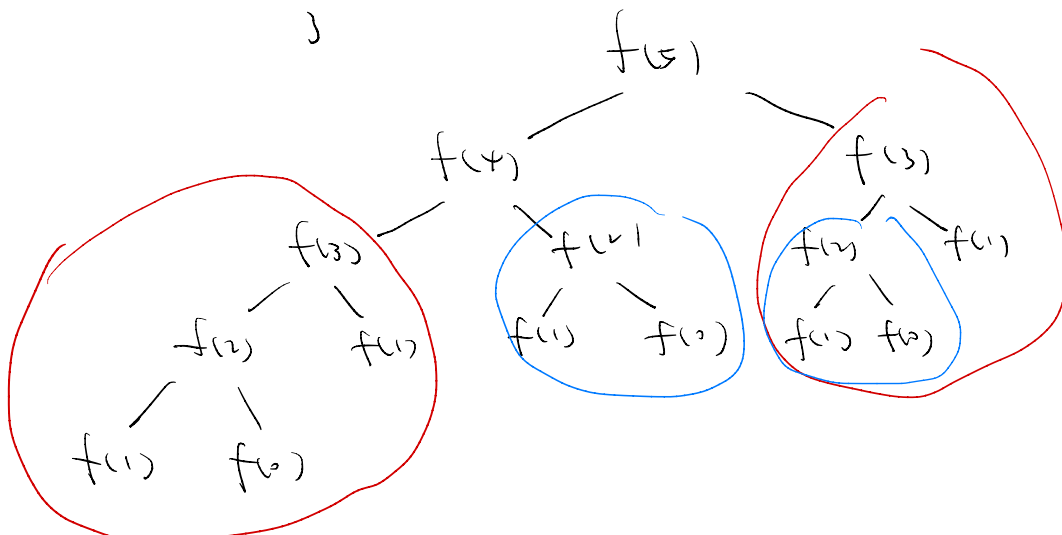
$$F[0] = 1 \quad F[1] = 1 \quad F[2-n] = N/A$$

<u>not populated, it's not available.</u>

fib(n) ?

   if $F[n] == N/A$

      $F[n] = fib(n-1) + fib(n-2)$

   return $F[n]$

        fib[5]

       ↙   ↘

     fib[4]   fib[3]

2^n $2 \cdot n$ ↙   ↘

     fib[3]   fib[2]

    ↙   ↘

   fib[2] fib[1]

   ↙ ↘

 fib[1] fib[0]

fib (n) ?

   prev = 1   prev prev = 1

   for i = 2   to n   do

      val = prev + prev prev.

     prev prev = prev

     prev = val

     return val

  }

    fib (n) ?

      $F[0] = F[1] = 1$

      for i = 2 to n

        $f(i) = F[i-1] + F[i-2]$

      return $F[n]$

  }

$\rightarrow$ | 1 | 1 | 2 | 3 | 5 | 8 | 13 | 21 |

$$fib(n) = fib(n-1) + fib(n-2)$$

Next time   extended Euclidean algorithm.

RSA