Class 13

Tuesday, February 8, 2022 8:59 PM

5	100
p1	150
p2	80
p3	200
p4	350
p5	20

```
pair<string,int> tmp;
tmp.first = "p1";
tmp.second = 180;
```

p2 180

p5 400

p1 450

p3 550

p4 800

```
queue<pair<string,int>> Q;
```

800

p1 →
p2 →
p3 →
p4 →
p5 →

—o—

Recursion

n!

$f(n) = n!$

$5! \rightarrow 5 \times 4!$

$5 \times (4 \times 3 \times 2 \times 1)$

$4!$

$f(0) = 1$

$f(5) = 5 \times 24 = 120$

$f(4) = 4 \times 6 = 24$

$f(3) = 3 \times 2 = 6$

$f(2) = 2 \times 1 = 2$

$f(1) = 1 \times 1 = 1$

$f(n) = n \cdot f(n-1)$

$f(n-1) = (n-1) \cdot f(n-2)$

$f(0) = 1$

0 1 2 3 4 5 6

a b c z c b a

L+1 R-1

L R

abba abeba

true false

isPalindrome(L,R) = (s[L] == s[R]) && (isPalindrome(L+1,R-1))

Fibonacci Series

f(0) f(1) f(2) f(3) f(4) f(5) f(6)

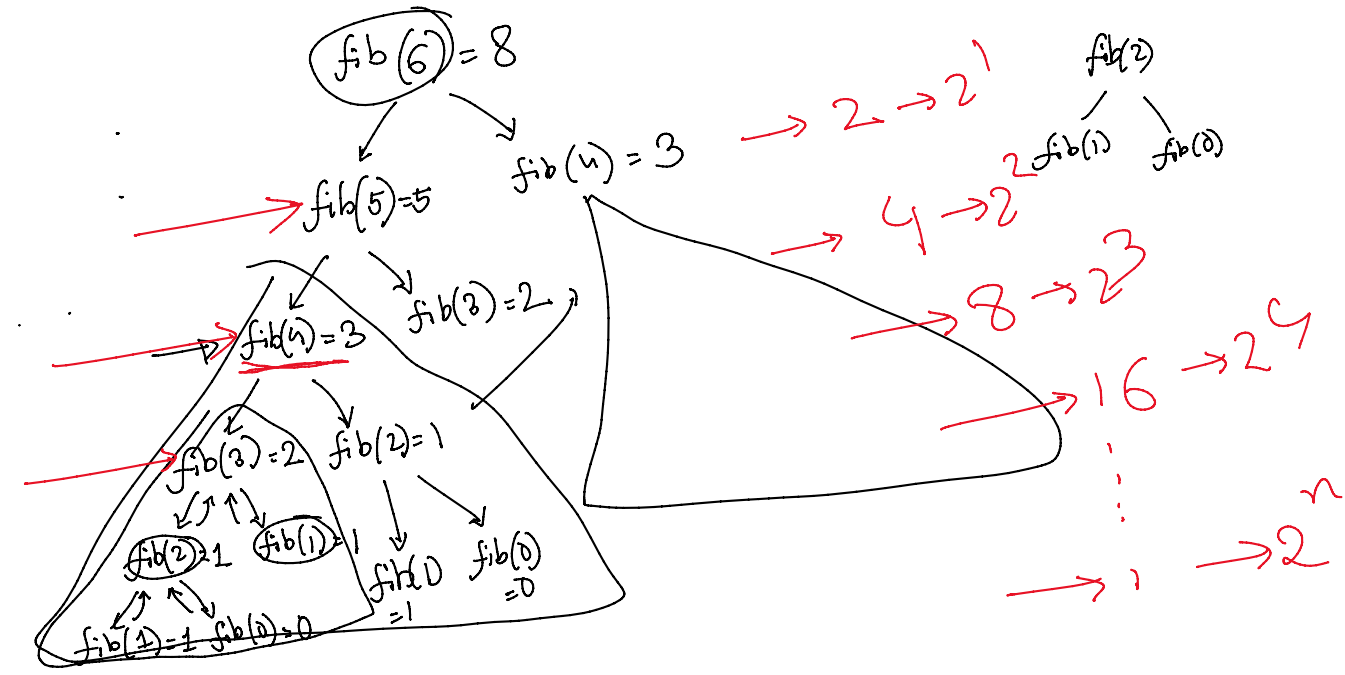
0, 1, 1, 2, 3, 5, 8, ...

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

$f(0) = 0$

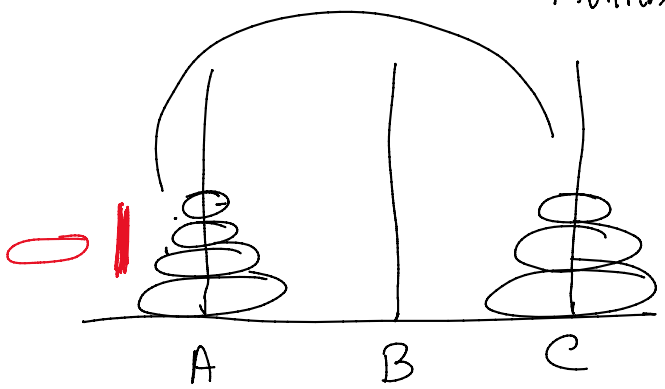
$f(1) = 1$

$f(n) = n ; n < 2$



$O(2^n) \rightarrow O(n) \rightarrow O(\log N)$

Matrix Exponentiation

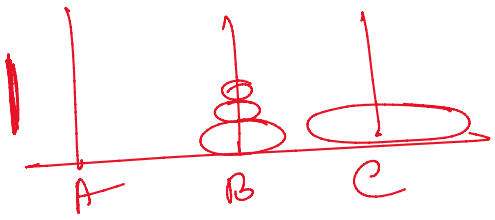


Tower of Hanoi

n=1 | A → C

n=2 |
A → B
A → C
B → C

src: A, B
dest: B, C → A → C
using: C, A




```
void solveHanoi(A src, B intr, C dest, n)
{
    if(n==0) return;
    ... n-1) ...
```

```
{   if(n==0) return;
    solveHanoi(src, dest, intr, n-1)
    cout << src << " " << dest << endl;
    solveHanoi(intr, src, dest, n-1)
}
```

solve('A', 'B', 'C', 4)