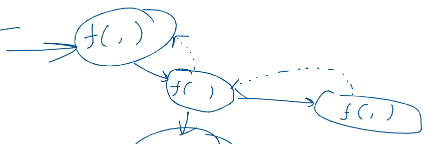
05.Iterative DP

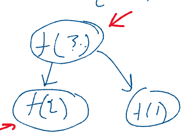
Thursday, March 18, 2021 12:17 AM

Bottom Up / Top-down

Top-down



$fib(n) = \begin{cases} fib(n-1) + fib(n-2); & n > 1 \\ n \end{cases}$



$f(2) = f(0) + f(1)$

$f(3) = f(1) + f(2)$

$f(4)$ . . . . . .

$\alpha \square n$

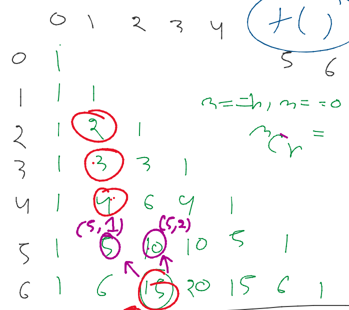
```
for (    ) {
    F[i] = F[i-1] + F[i-2]
```

$$^{N}C_{R} = {}^{N-1}C_{R-1} + {}^{N-1}C_{R}$$

$^{n}C_{r}$

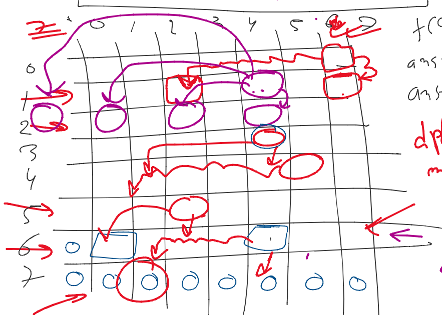
if (dp[n][r] != -1) ret dp[n][r]

dp[n][r] = Comb(n-1, r-1) + Comb(n-1, r)



$(6,2) \rightarrow {}^{6}C_{2} = {}^{5}C_{1} + {}^{5}C_{2}$

$^{6}C_{2}$



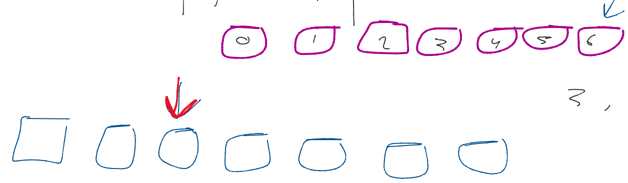
f(0, 15)

ans = V[in] + f(in+1, rem - W[in]);

ans = max(ans, f(in+1, rem));

dp[in][rem] = max(dp[in][rem-W]+... , dp[in+1][rem])

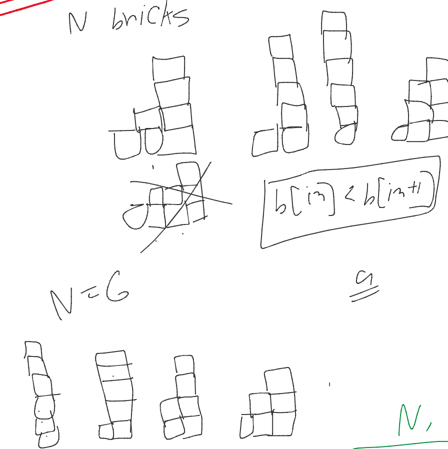
dp[6][0]



3 , 10

Staircase

N bricks



b[in] < b[in+1]

N = 6

N, last

f(N, □) {

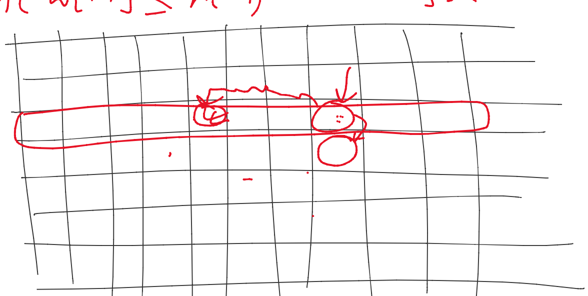
last

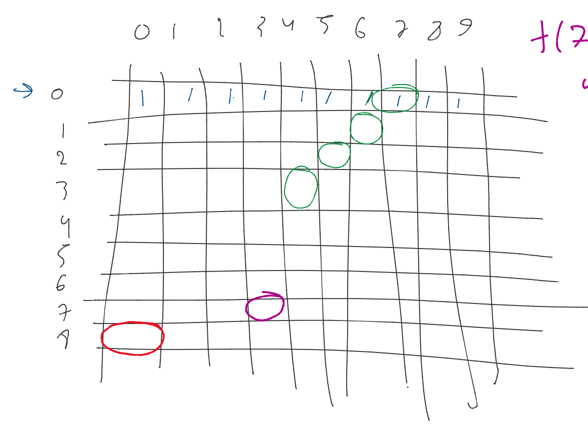
ans =

}

```
for ( . . . . . . )
ans = max(ans, in+1, rem);
if ( w[in] ≤ rem )  ans = V[in] + f(in, rem - W[in])
```

f(in, rem)





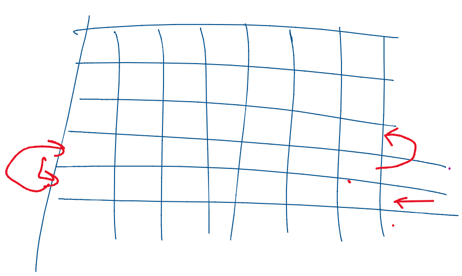
$f(7,3) \rightarrow f(3,4)$

4,5,6,7 f(2,5)

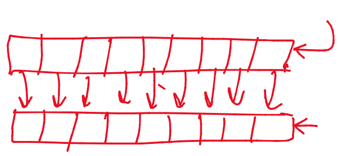
f(1,6)

f(0,7)

f(in, last) → f(



O(N)



$-t, t$)