198.House Robber

05 September 2023 18:16

[1 3 2 1]

1,2 → 3

3,1 → 4 ✓ max

Pseudo Code : Recursion

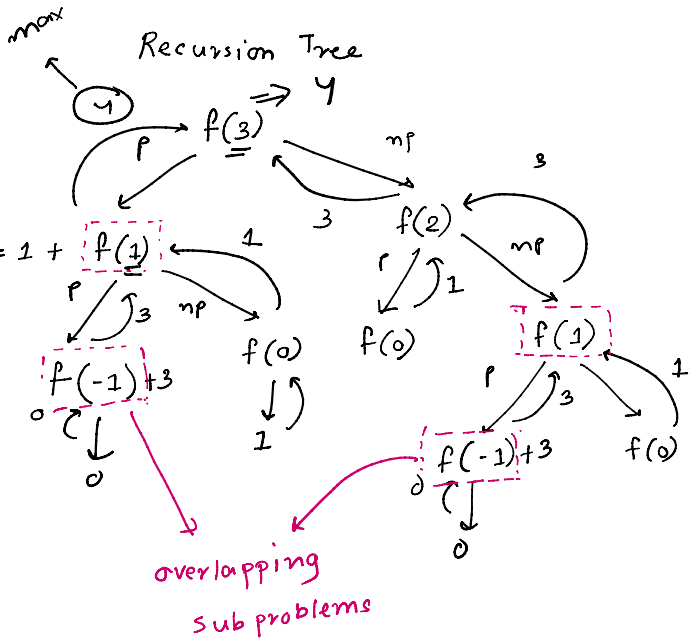
```
f( ind, arr)
if ( ind==0) return arr[ind];
if ( ind<0 ) return 0;
int pick = arr[ind] + f( idx-2, arr);
int npick =  0 + f( idx-1, arr);
return max ( pick | npick)
```

base

all operations

pick ≈ take

TC → 2^n



1) Memoization

```
f( ind, arr, dp)
if ( ind==0) return arr[ind];
if ( ind<0 ) return 0;
if( dp[ind] != -1) return dp[ind];
int pick = arr[ind] + f( idx-2, arr, dp)
int npick =  0 + f( idx-1, arr, dp)
return  dp[i]= max ( pick | npick)
```

base

TC → O(N)

SC → O(N) + O(N)

Stack Space

dp vector

2. Tabulation

```
vector dp (n,-1);
for( int i=1 ; i<n ; i++)
{
    pick = arr[i]; if(i>1) pick += dp[i-2];
    npick =  dp[i-2];
    dp[i] = max (pick, npick) ;
}
```

if (i<0) return 0

3 + f(-1) = 3

∴ pick = 3 ; if (1 > 2)...

∴ pick = 3

```
    dp[i] = max(pick, npick);
}
```

TC = O(N) SC → O(N) { No recursion, no stack space }