We will be having a value n.

We will try to find the no. of ways to get a sum equal to n by dice throws.

n = 3 →

1 + 1 + 1

1 + 2

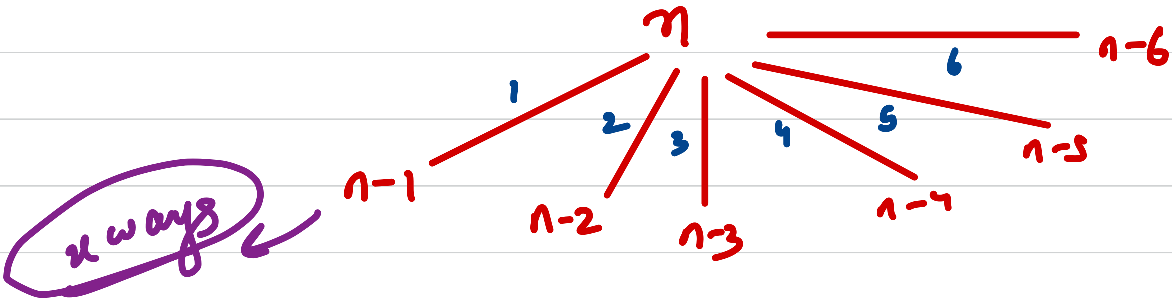
2 + 1

3

4 ways

count

optimal



Base Case

Assumption

Self work

Let's write a function $f(n)$

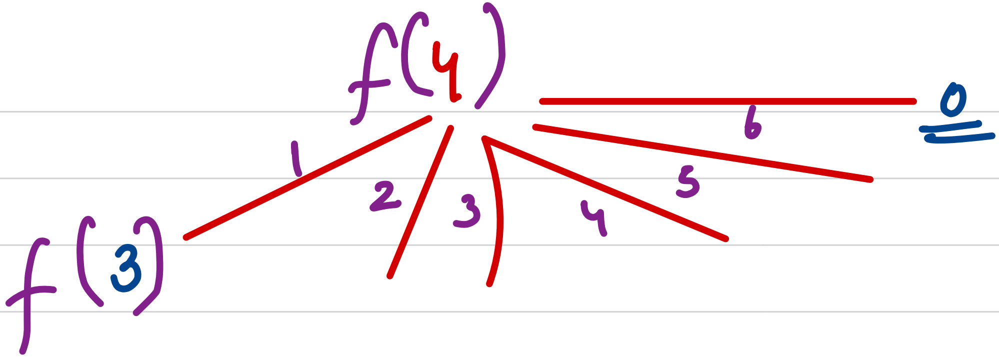
$$f(n) = f(n-1) + f(n-2) + f(n-3) + f(n-4) + f(n-5) + f(n-6)$$

calc the no. of ways to get sum n by dice throw

if $n == 0 \rightarrow$ return 1

$(n-k \geq 0)$

$k \in [1,6]$



$f(3) = 4$

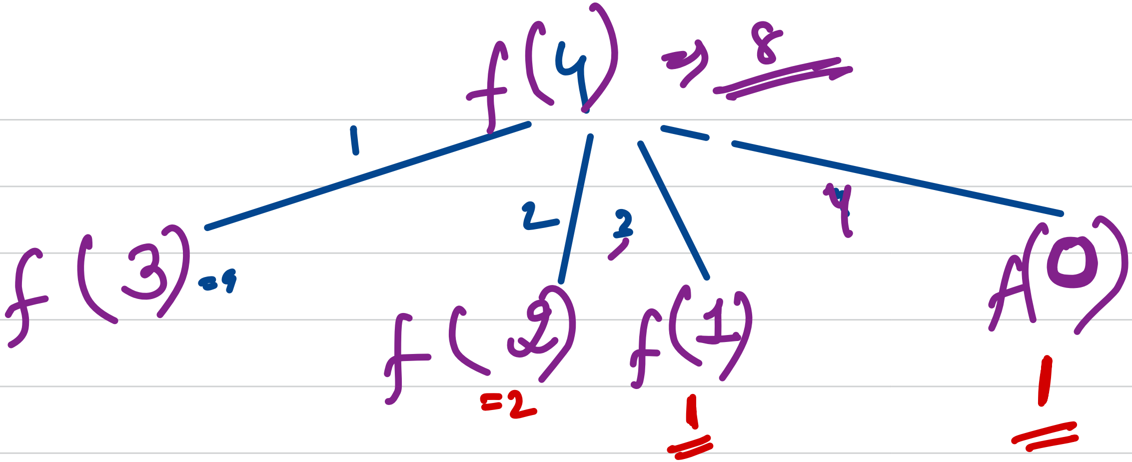
1+1+1+1

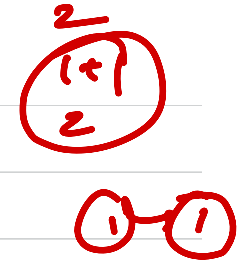
1+2+1

2+1+1

3+1

4



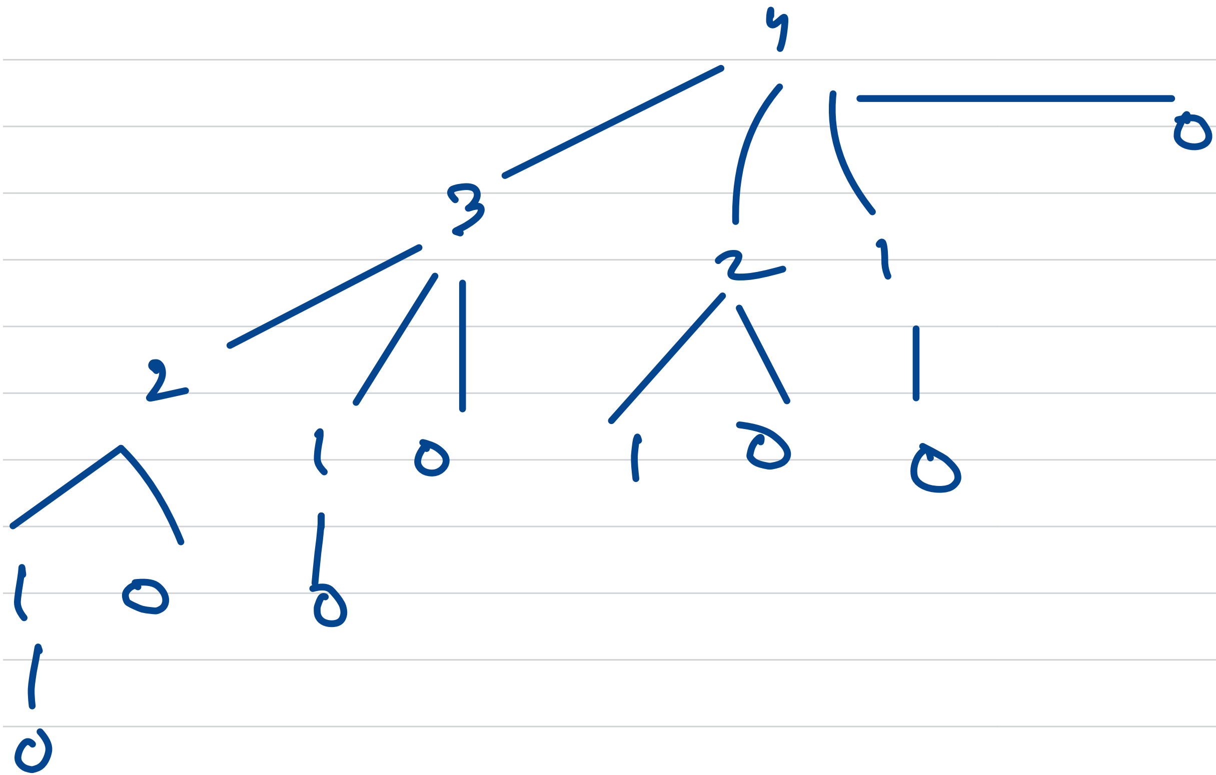


Set → [1,2,3] → 2^3 subsets

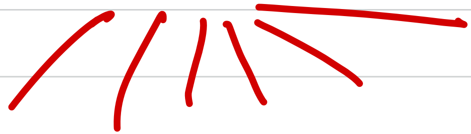
↳ { }

↳ null set

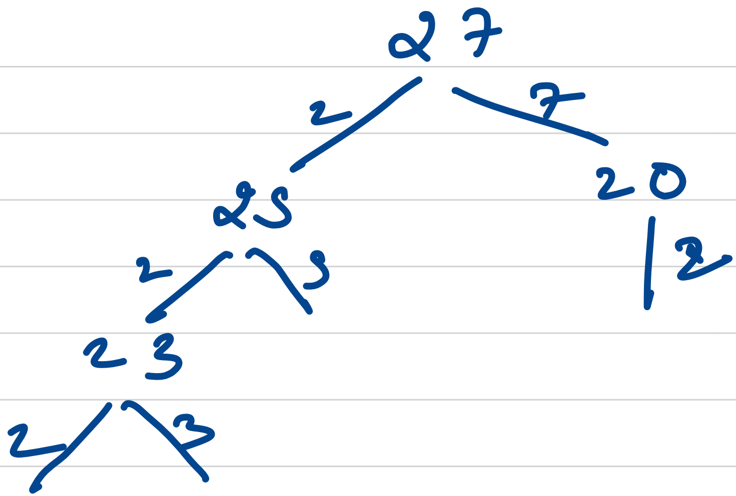
1+1+1+1
1+2+1
2+1+1
3+1
1+1+2
2+2
1+3
4


4
3 2 1 0
2 1 0 1 0 0
1 0 0
0

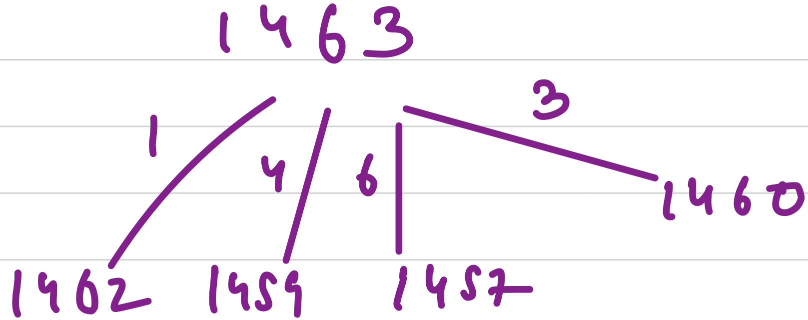
n



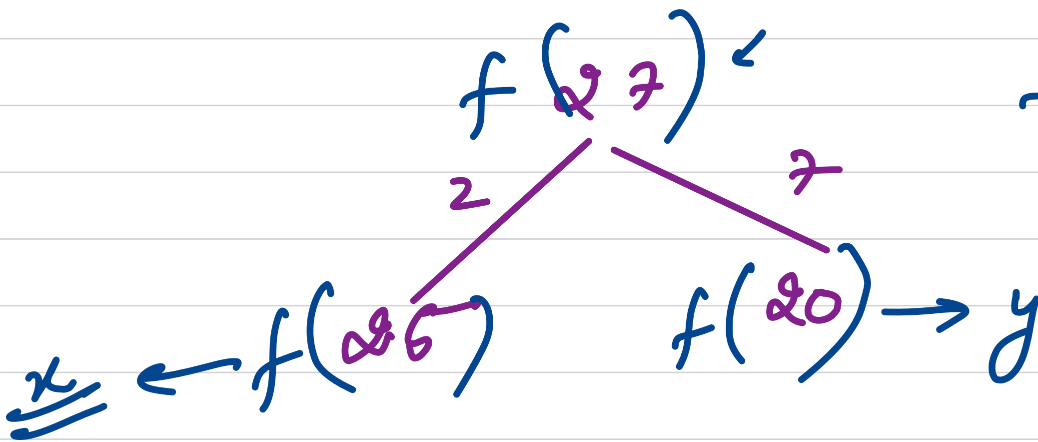
1
2
3
4
5
6


27
2
7
25
20
2
3
2
23
2
3

[1 → 8]



$\min(x, y)+1$



$$f(n) = 1 + \min\Big(f(n-d_0),\ f(n-d_1),\ f(n-d_2) \cdots f(n-d_{10})\Big)$$

min steps to reduce n to 0 by sub digits

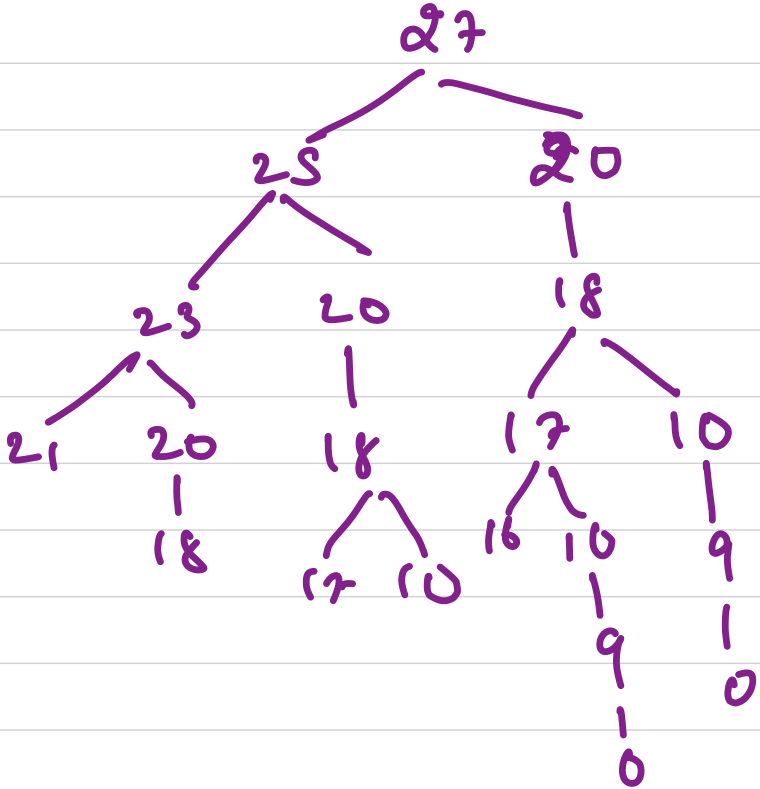
Base Case

- Single digit no. → ans → 1
- n==9 → 1
- if n==0 → 0 steps

```
if(n==0) return 0;
if(n<10) return 1;
```

Base Case

$n = 7$



$n = 12$

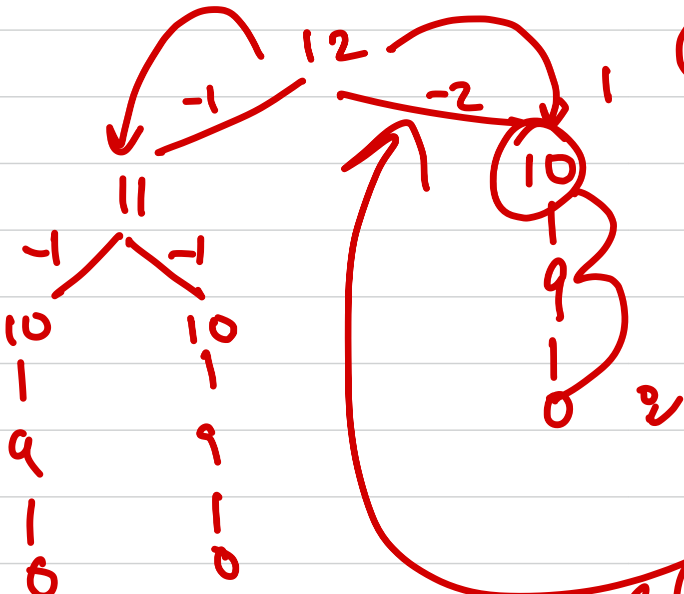
$f(12)$

$ans = 1 + \min(\text{—})$

3

$1 + f(n)$

$f(11) = 3$

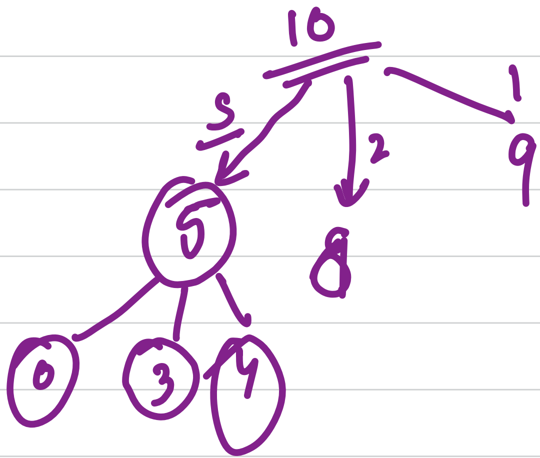


$f(10) = 2$

$1 + \min(f(10), f(n))$

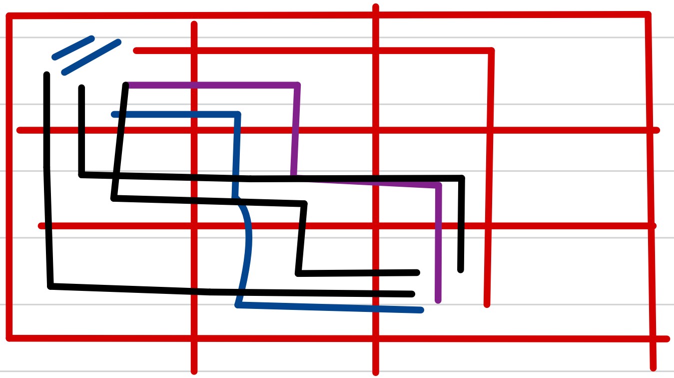
$1 + \min(2, 3)$

min $\rightarrow f(10) = 2$



{ 1 coin
2 coin
5 coin }

$$f(n) \Rightarrow \min\big(f(n-5),\ f(n-2),\ f(n-1)\big) + 1$$



(m, n)

3×3

DDRR
DRDR
DRRD
RRDD
RDRD
RDDR

6 ways

chng

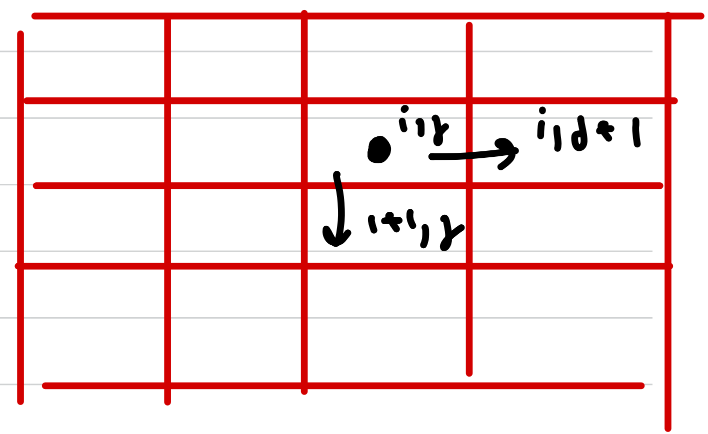
$$f(i, j, m, n) = f(i+1, j, m, n) + f(i, j+1, m, n)$$

const

total ways to reach m, n from i, j

Base Case

```
if (i == m && j == n)
    return 1;
if (i > m || j > n) return 0;
```



ans → $f(1, 1, m, n)$

~~6~~ 0,0	0,1 3	
3 1,0		