

Variant 1: You have N taka and you want to make change with K coins Assuming that number of K coins are infinite. Is it possible to change N taka with the coins?



Variant 2: You have N taka and you want to make change with K coins. Assuming that number of coins are infinite. How many ways it is possible to change N taka with the coins?

Variant 3: You have N taka and you want to make change with K coins. Now, you can take a coin only once. Is it possible to change N taka with the coins?



Variant 4: You have N taka and you want to make change with K coins. Now, you can take a coin only once. How many ways it possible to change N taka with the coins?

Variant 5: You have N taka and you want to make change with K coins. Assuming that number of K coins are infinite. But, any two ways are same if the frequency of the coins are equal. How many ways it is possible to change N taka with the coins?

Variant 6: You have N taka and you want to make change with K coins with value [V1, V2, V3, ..., V_k] with frequency of each coin [F1, F2, F3, ..., F_k]. Is it possible to change N taka with the coins?

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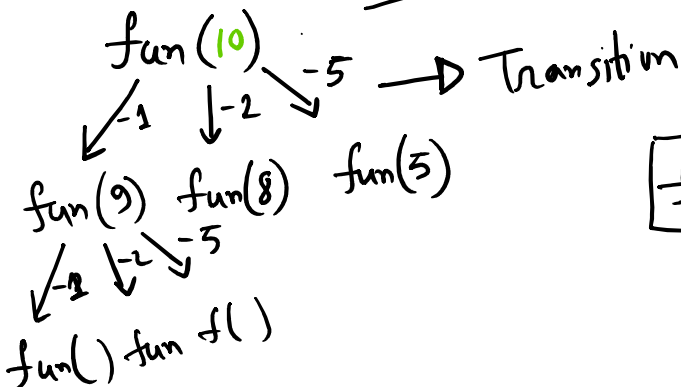
N=10

Definition \rightarrow $fun(N) \rightarrow$ Is it possible to make Total Amount

yes/no
0/1

N taka
K coin

① ② ⑤
N=11



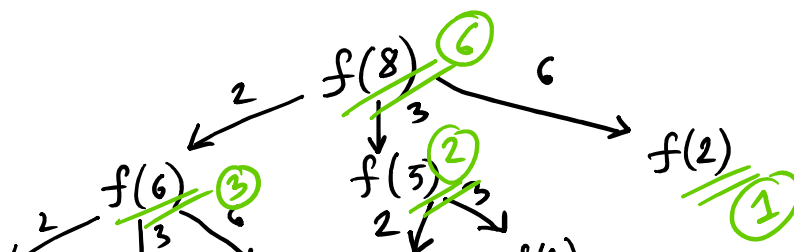
$fun(0) = 1/\text{true}$ \rightarrow Base Case

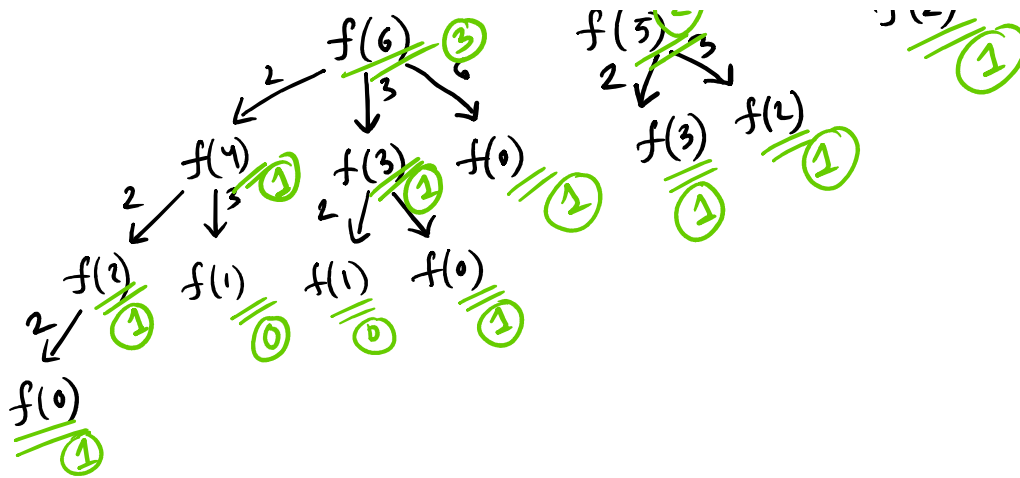
Variant 2: You have N taka and you want to make change with K coins. Assuming that number of coins are infinite. How many ways it is possible to change N taka with the coins?

$f(N) \rightarrow$ returns the number of ways it is possible to make N

coins = 2, 3, 6
8

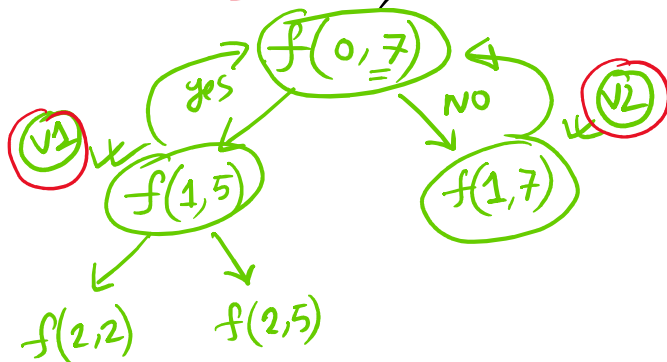
$f(0) = 1$



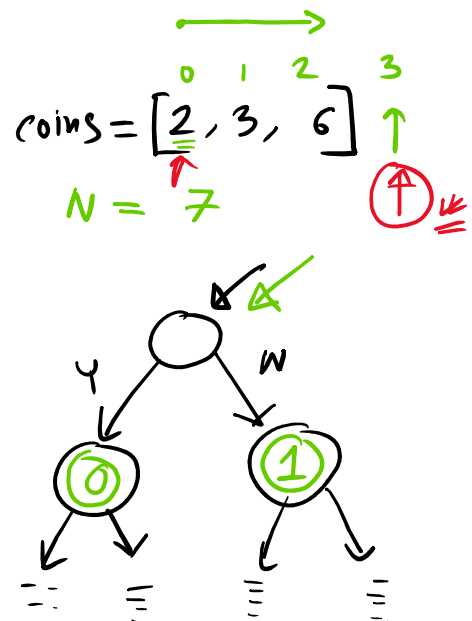
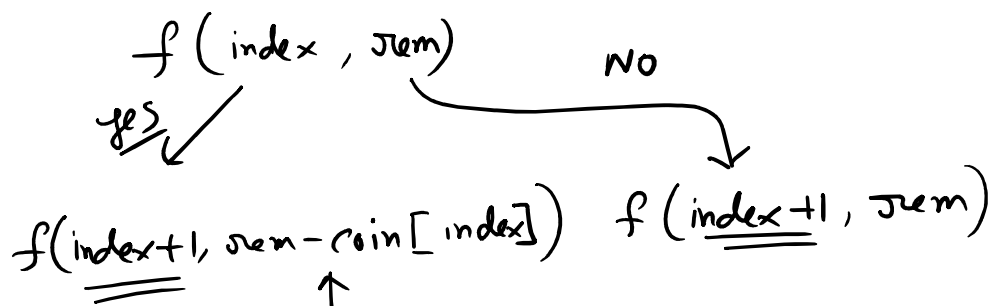


Variant 3: You have N taka and you want to make change with K coins. Now, you can take a coin only once. Is it possible to change N taka with the coins?

$$f(\text{index}, \text{remaining}) \Rightarrow 0/1$$

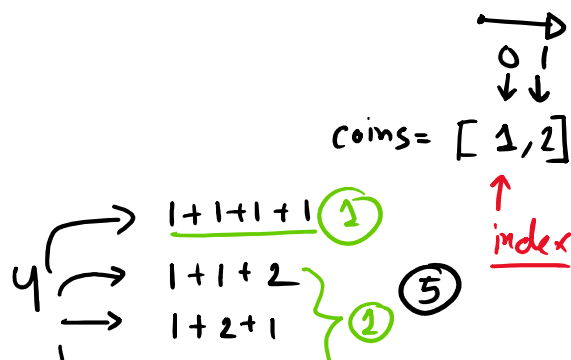


$$f(0, 7) = \underline{V1 + V2} / \underline{V1 - V2} / (\underline{V1 / V2})$$

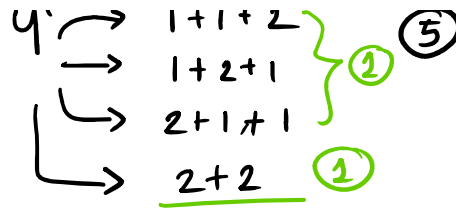


Variant 4: You have N taka and you want to make change with K coins. Now, you can take a coin only once. How many ways it is possible to change N taka with the coins?

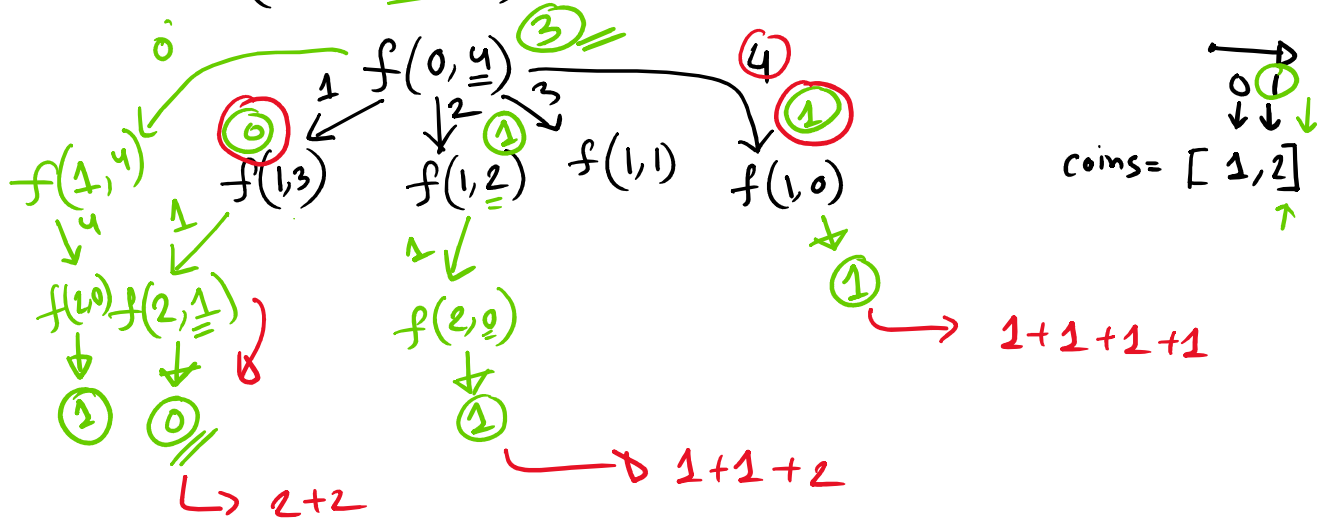
Variant 5: You have N taka and you want to make change with K coins. Assuming that number of K coins are infinite. But, any two ways are same if the frequency of the coins are equal. How many ways it is possible to change N taka with the coins?



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$f(\text{index}, \text{remaining}) \rightarrow \text{number of ways}$



Variant 6: You have N taka and you want to make change with K coins with value [V1, V2, V3, ..., Vk] with frequency of each coin [F1, F2, F3, ..., Fk]. Is it possible to change N taka with the coins?

coins = [2, 3, 5]
 freq = [1, 2, 1]

Amount = 10

$$(2 \times 1) + (3 \times 1) + (5 \times 1) \Rightarrow 10 \quad \checkmark$$

$$\Rightarrow 12 \quad \times$$

$$\Rightarrow 13 \quad \checkmark$$