

Coin Change Permutations

Friday, 30 April 2021

7:01 PM

coins →
target

Smart calls -

base case → ($\text{target} == 0$) Point
the c

termination

case →



Depend on

smart calls: $2 - 2 \geq 2$



$\{2, 3, 5, 6\} \rightarrow \text{Infinities}$

nt

one's

base
case

2

3

4

5

6

$$10 - 5 > 0$$

terminations

1.
2.
3.
4.
5.
6.

Base

Ter

2 2 3

2 3 2

25

2 2 2

5 2

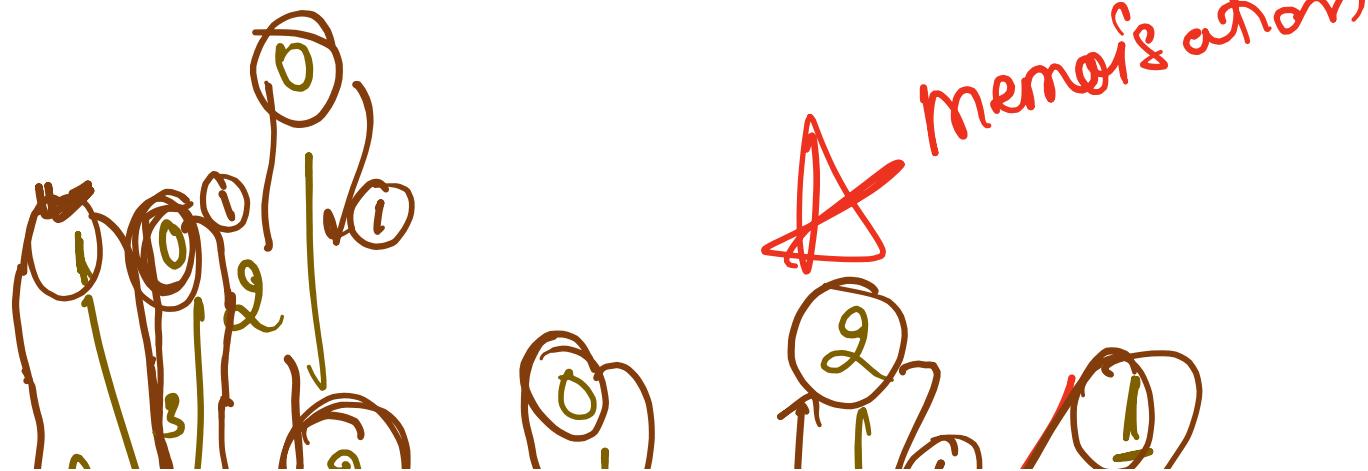
- case >

min'ration

Call \rightarrow (forget - cons[i])

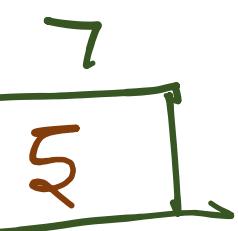
Memoisation using DP,

0	1	2	3	4	5	6
1	0	1	1	1	3	





`P = new int[target + 1];`



```

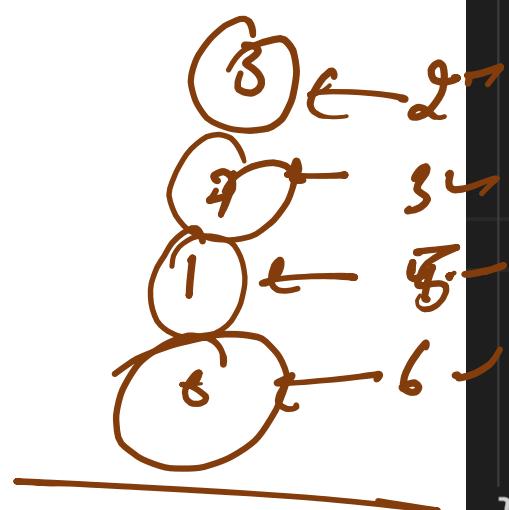
public static int coinChangePerm_memo(int[] coins, int target) {
    if(target == 0) {
        return dp[target] = 1;
    }

    if(dp[target] != 0) {
        return dp[target];
    }

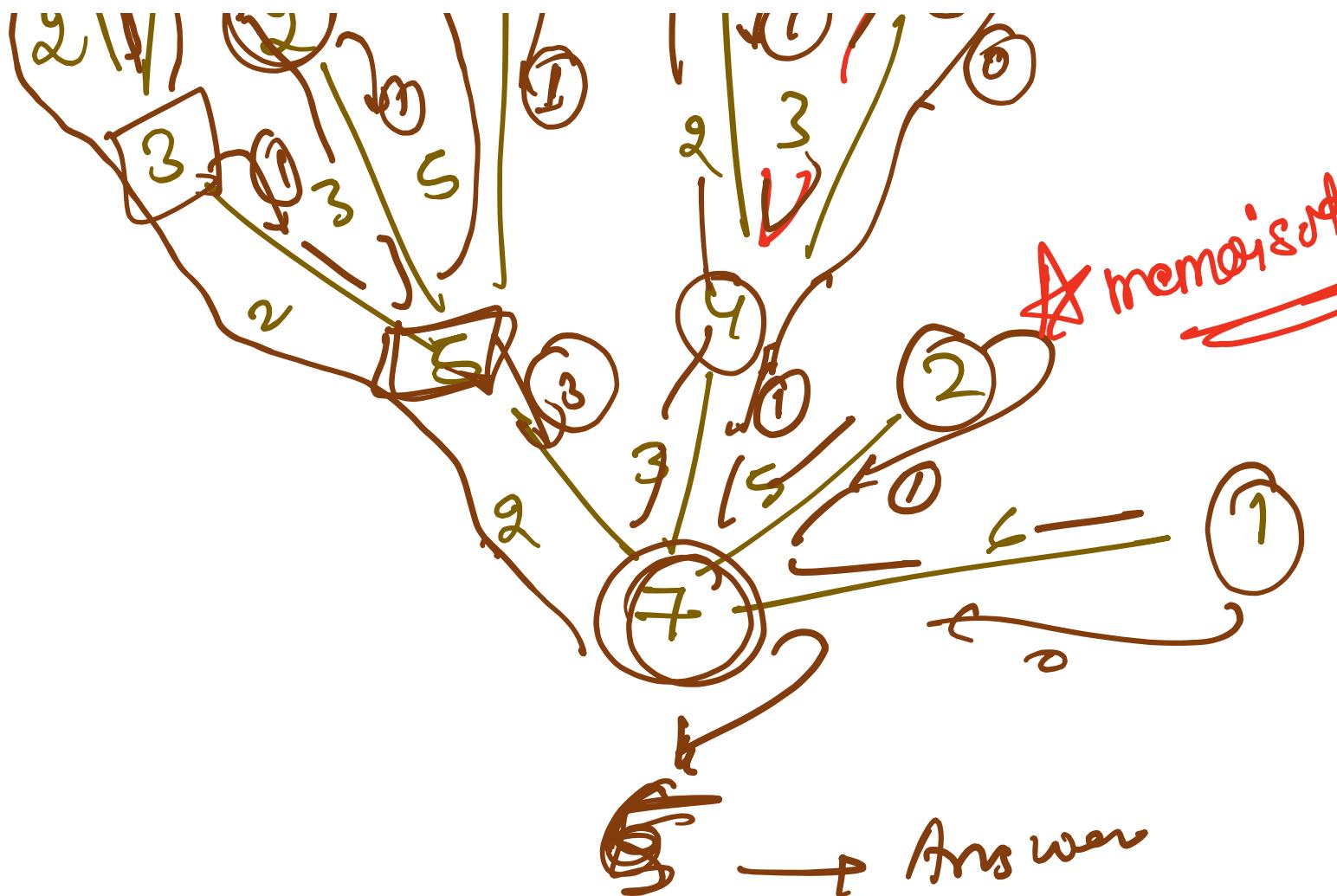
    int count = 0;
    for(int i = 0; i < coins.length; i++) {
        int coin = coins[i];
        if(target - coin >= 0) {
            count += coinChangePerm_memo(coins, target - coin);
        }
    }
    return dp[target] = count;
}

```

target = 5



```
] coins, int target, int[] dp) {  
    if (target < 0) return -1;  
    if (target == 0) return 0;  
    if (dp[target] != null) return dp[target];  
    int min = Integer.MAX_VALUE;  
    for (int coin : coins) {  
        int res = coinChange(coins, target - coin, dp);  
        if (res == -1) continue;  
        min = Math.min(min, res + 1);  
    }  
    dp[target] = min == Integer.MAX_VALUE ? -1 : min;  
    return dp[target];  
}  
  
int coinChange(int[] coins, int target, int[] dp) {  
    if (target < 0) return -1;  
    if (target == 0) return 0;  
    if (dp[target] != null) return dp[target];  
    int min = Integer.MAX_VALUE;  
    for (int coin : coins) {  
        int res = coinChange(coins, target - coin, dp);  
        if (res == -1) continue;  
        min = Math.min(min, res + 1);  
    }  
    dp[target] = min == Integer.MAX_VALUE ? -1 : min;  
    return dp[target];  
}
```



target + 1

coins → 2, 3, 5, ?

target → 0 1

1	0
-	-
-	-
-	0

storage ≈ target + 1

Meaning assign ↪

Time & space analysis

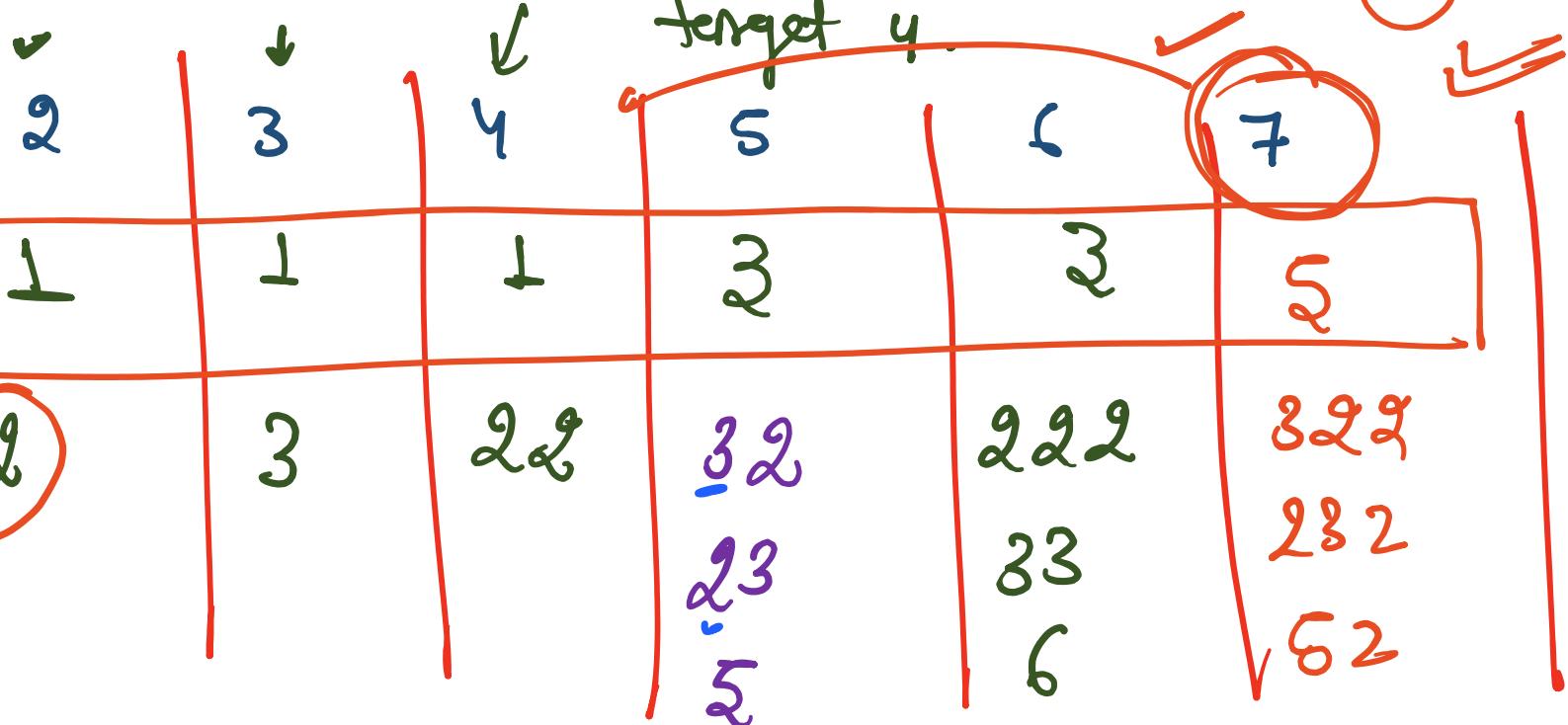
Coins → { 2, 3, 5 }

10

三

$$\overline{ab}^{[7-3]}c$$

No. of ways to prepare
forget u



6)

b[4]