Coin Change Problem

if arr = [1|2|3] (0 1 2) target = 5

you have to find minimum no. of element → to reach the target SUM.

{1,1,1,1,1} → 5
{1,2,1,1} → 4
{2,2,1} → 3
{3,1,1} → 3
{3,2} → 2 → minimum no. of element to reach target SUM.

Note Target Reach krne ke we have 2 way

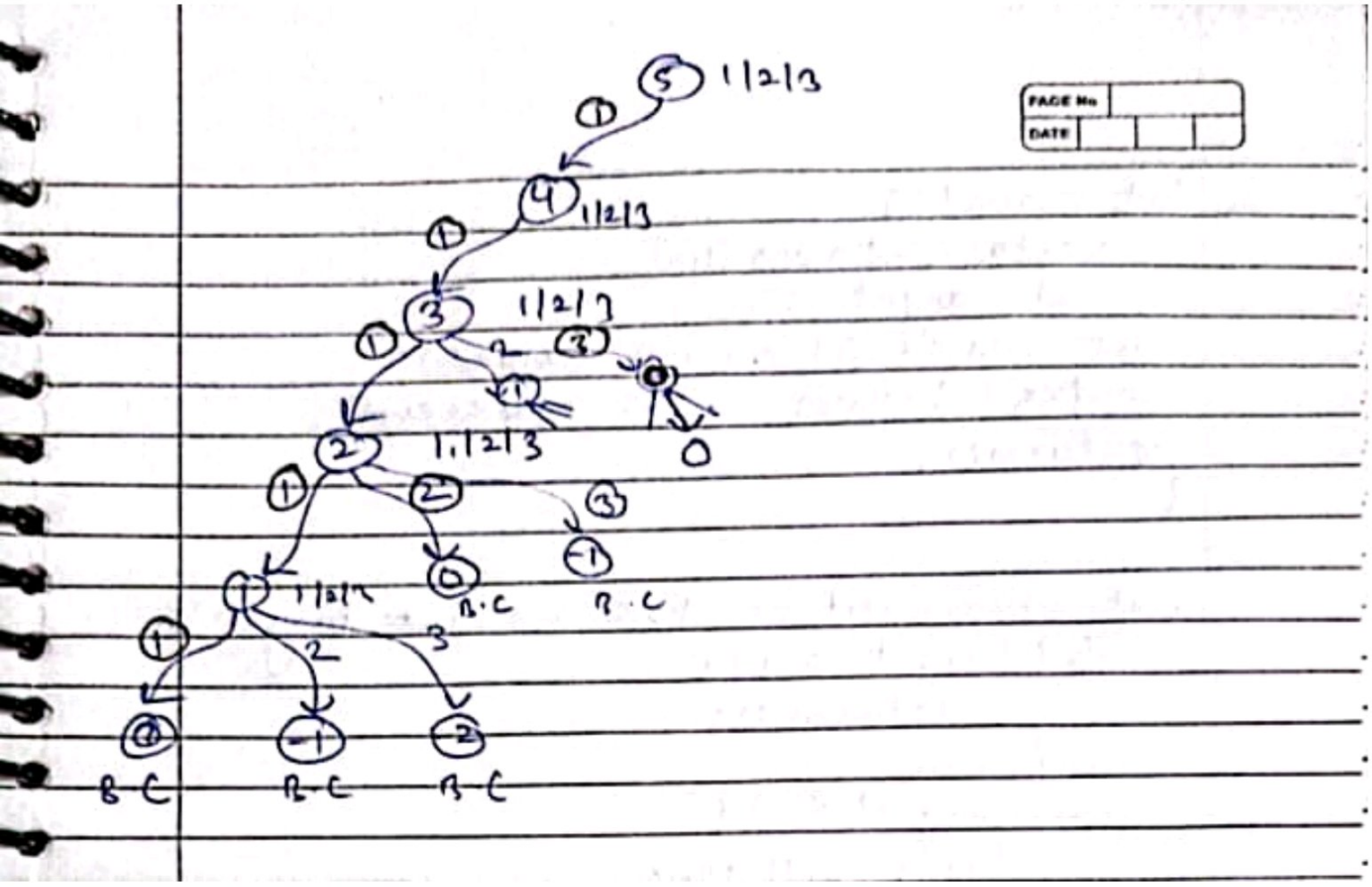
1) target → 0 (if target == 0) means reach target

original value ko decrease krega 0 tk jane ke lie

2) 0 → 5(target) → target Reach hojaega, but here use Additional variable, jo ki 5 ko store krega, jisse hum 0 me update krke 5 ko reach kre.

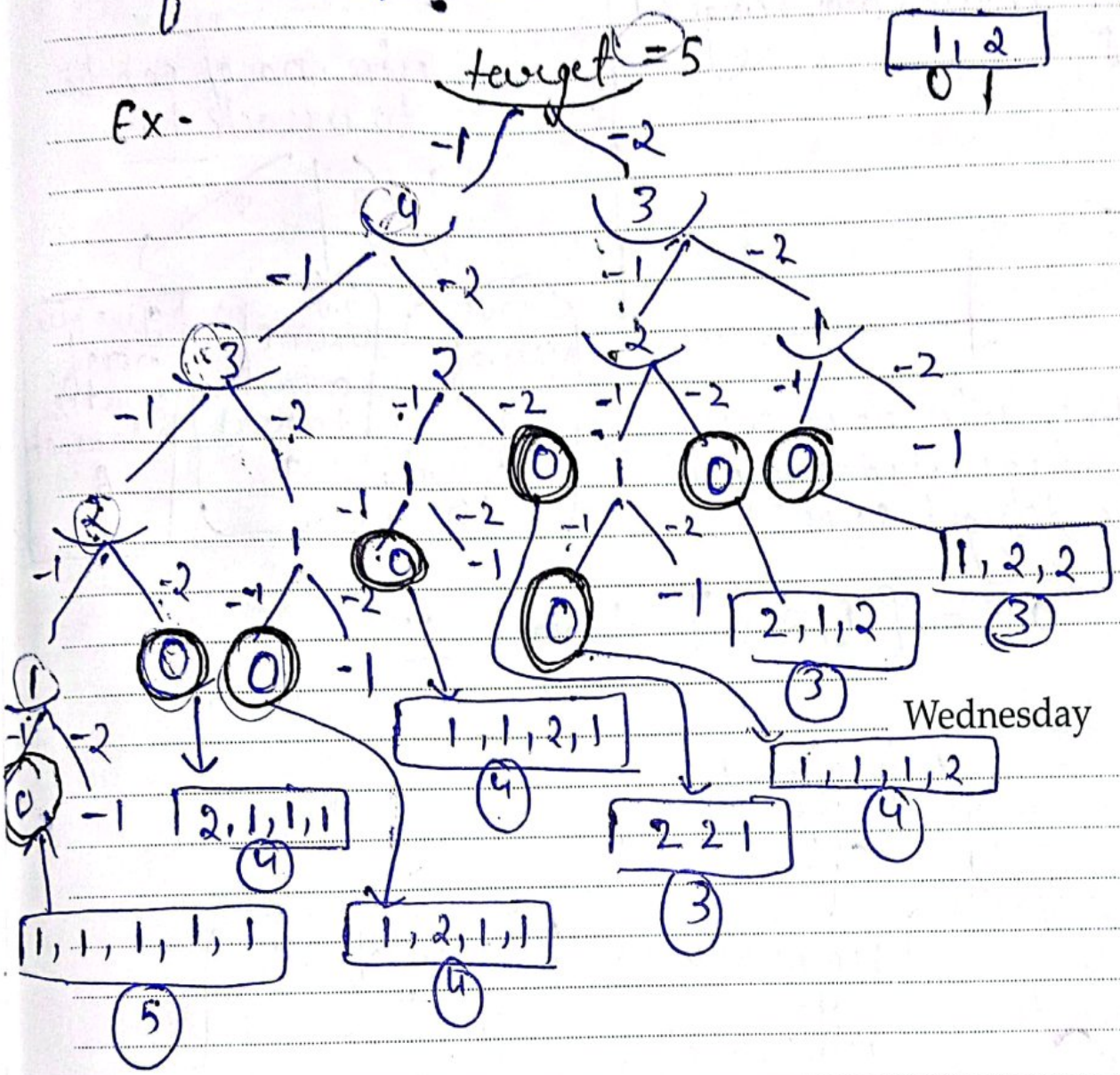
original ko store for comparison

Extra variable lekr usko update krenge upto 5 Kyuki last me check bhi to krna pdega, na ki kya jo variable lie hai wo target ke barabar hai ki nhi



if both equal means, we reach target

Ex-



21 Thursday

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

```
int solve(arr, target)
{

}
```

give Min. no. of coins required to reach the target SUM

min. no. of coins to reach 11

1 | 2 | 5

give min. of coins to reach 10

give min. coins to reach 9

give min no. of coins to reach 6

arr = [1, 2, 5] target = 11

ye sb hume function dega. bas

22 Friday

Min. of coins to reach 11

1 | 2 | 5

1 coin of 1₹ + min coin to 10₹

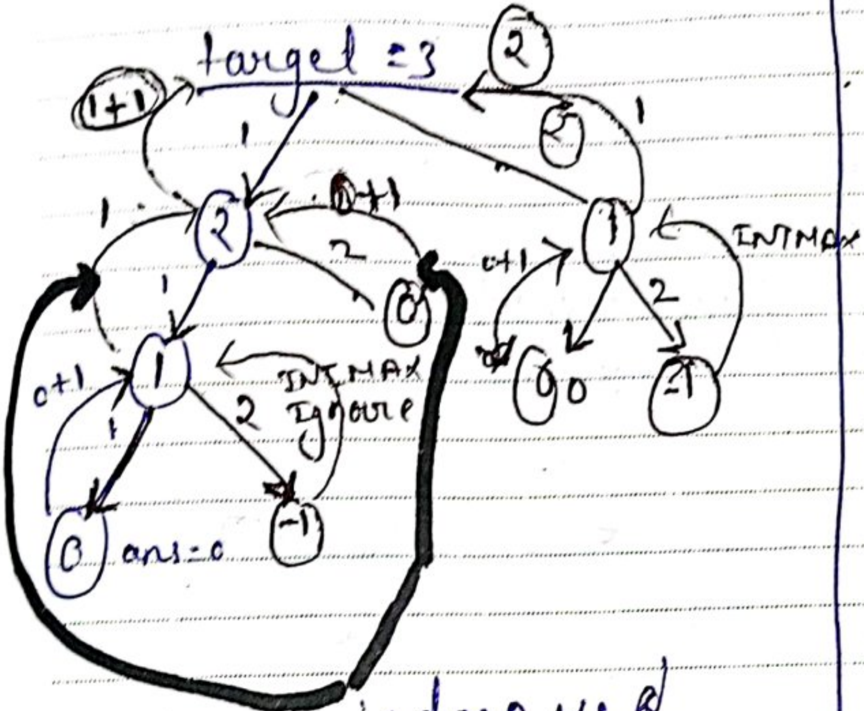
1 coins of 2₹ + min coin of 9₹

1 coin of 5₹ + min coin of 6₹

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

arr [1 | 2] (indices 0, 1)

mini = ∞



indono me se jo minimum hoga woo upar jaega

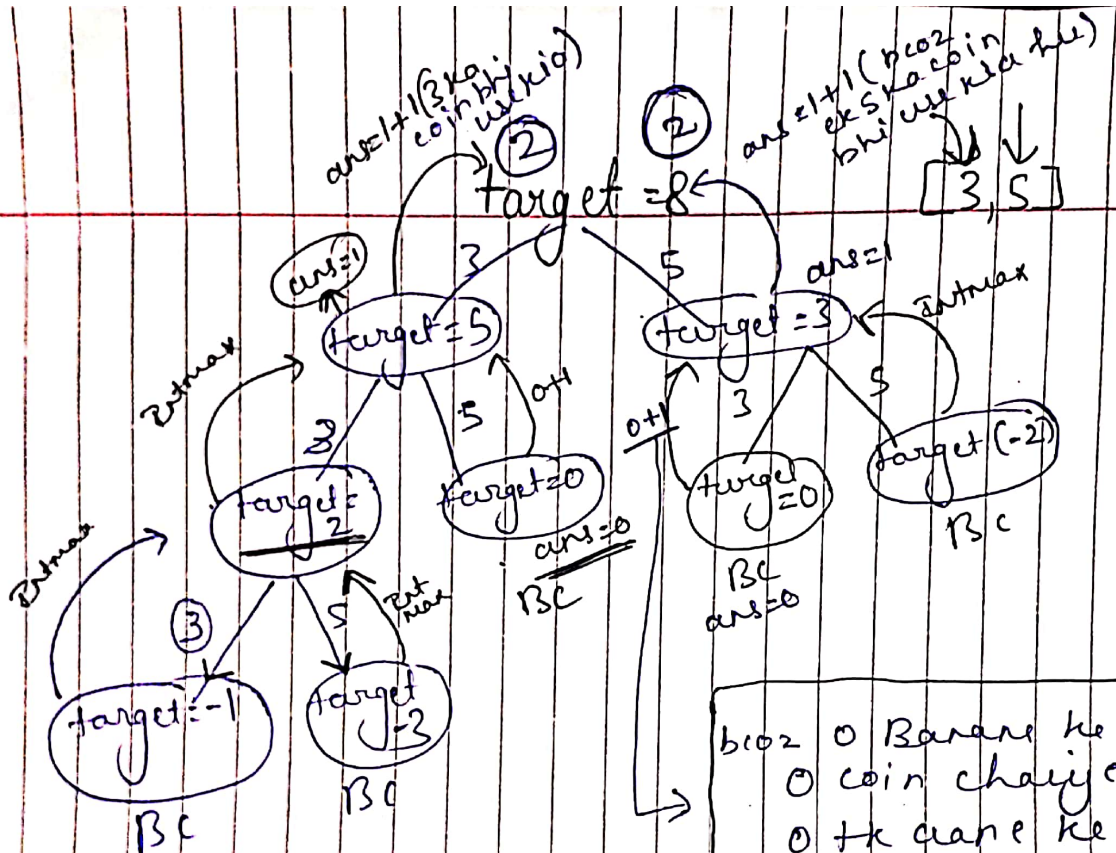
```
int solve(arr, target)
{
    if(target==0)
        return 0;

    if(target<0)
        return INT_MAX

    int mini = INT_MAX;
    for(i=0; i<n; i++)
    {
        int ans =
        solve(arr, target-arr[i])

        if(ans!=INT_MAX)
        {
            mini = min(mini, ans+1)
        }

    return mini;
}
```



So Our final ans = 2

-ve value ko ignore kia hai vi this line

```
if (target < 0)
    { mini = INTMAX
    }
```

bcoz 0 Banane ke lie mujhe 0 coin chaiye but 0 tk aane ke lie maine ek 3 ka coin bhi to use kia tha that's way it return ans + 1

DATE
PAGE

Cut into segments

ip → N = rod length.
Maximum no of segments but only with x, y, z.

eg. N = 7
x = 5
y = 2
z = 2

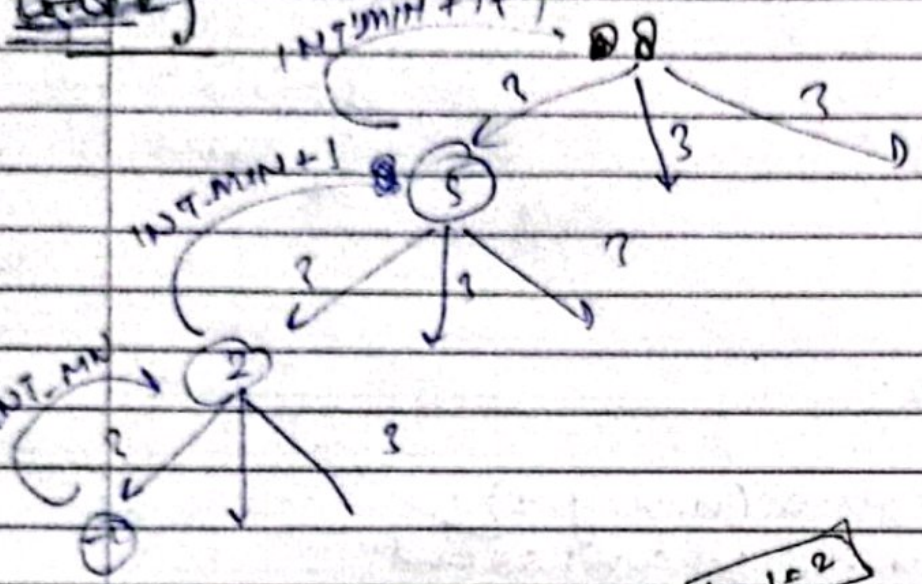
```
int main() {
    int n=7;
    int x=5;
    int y=2;
    int z=2;

int ans = solve(n,x,y,z);
cout << "Ans is " << ans << endl;
  return 0;
}
int solve(int n, int x, int y, int z) {
    if(n==0) {
        return 0;
    }
    int ans=0;
    if(n-x>=0) {
      ans = solve(n-x,x,y,z)+1;
    }
    int b=0;
    if(n-y>=0) {
        b= solve(n-y,x,y,z)+1;
    }
```

```
if(ans<0)
    ans=0;
```

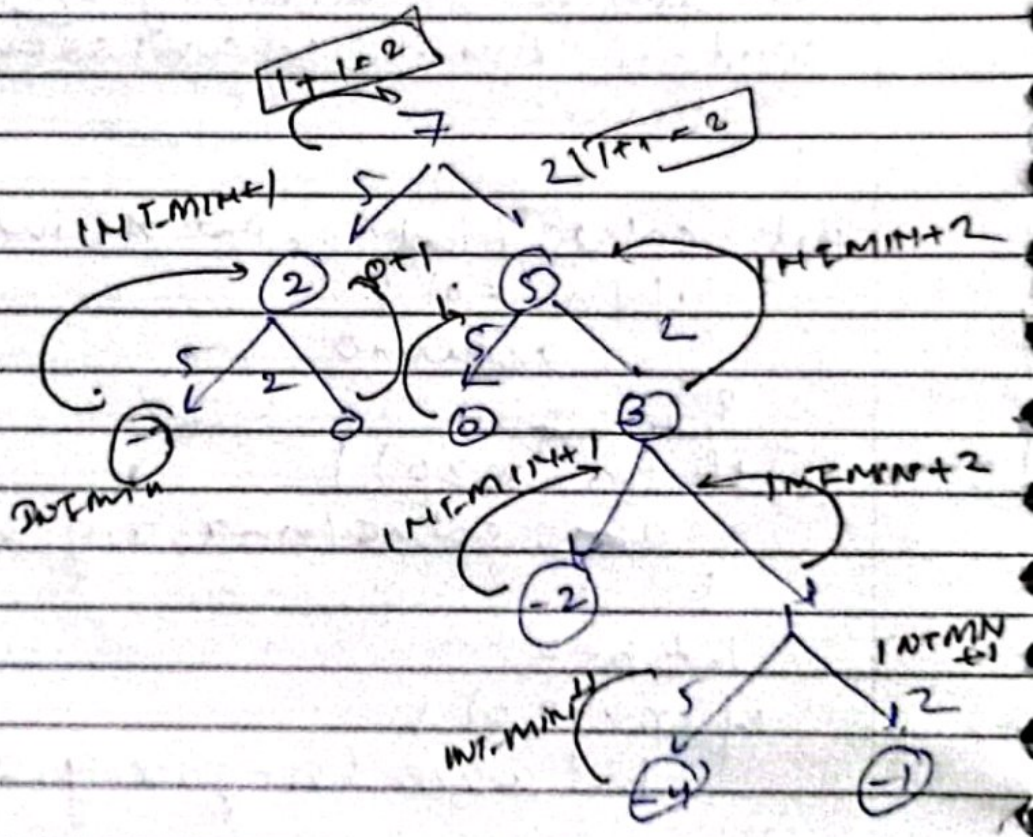
```
int c=0;
if(n-2 >=0){
  c= solve(n-2,x,y,z)+1;
}
int ans = max(a, max(b,c));
return ans
}
```

Solve)



eg.

$n=7$
$x=5$
$y=2$
$z=1$



x n-x.

1 + ans

Reason of 1 + ans

3) Maximum sum of non adjacent elements

i/p. [2|1|4|9]

Return the max sum of seleseguence in which no two elements are adjacent

2+4 = 6
1+9 = 10
2+9 = 11

i=0

[2|4|4|9]

inc i=i+2 | exc i

[2|1|4|9] | [2|1|4|9]

[2|1|4|9] i

inc | exc

[2|1|4|9] i | [2|1|4|9] i

B. C.

Question me Sub sequence ki bt kia hai mtlb sub sequence me element ka preset or absent hota hai

means Use Include / Exclude Technique