Dynamic Programming

Partition Equal Subset Sum:-

N = 4

arr[] = {1, 5, 11, 5}

N = 3

arr = {1, 3, 5}

Total = 22 = $\frac{22}{2}$ = 11

{1,5,5}

{11}

Total = 22

{} {}

{1,5,5}

11

YES

11

{11}

11

NO

arr → 2   3   /2

Total: → Even → 2 ?
Sum   → 3

       → Odd →

① odd

(2 3)   Even (22)

return
  O
          23   (1.5)
          2

          { 3 }   2 3

Sum = 22 = (11) ← target
         2

                Subset with
                Sum target

arr→ { 1, 5, 11, 5 }

Total = 22 → Even

target = 22/2 = 11

target

True

index

{ 1, 5, 11, 5 }, 11, 0

target   sum

T
in   ex

index

{ 1, 5, 11, 5 }, 10, 1

T   F
in   ex
Index

{ 1, 5, 11, 5 }, 11, 6

F   T
in   ex

T or F

= 0

$\{1, 5, 11, 5\}, 11, \boxed{17}$

$\{1, 5, 11, \underset{\substack{\uparrow \\ index}}{5}\}, 11, 6$

True

in

cx

F

$\{1, 5, \underset{\substack{\uparrow \\ index}}{11}, 5\}$ ⟨11⟩ ⟨11⟩

$\{1, 5, 11, 5\}, 11, 6$ index ↑ b
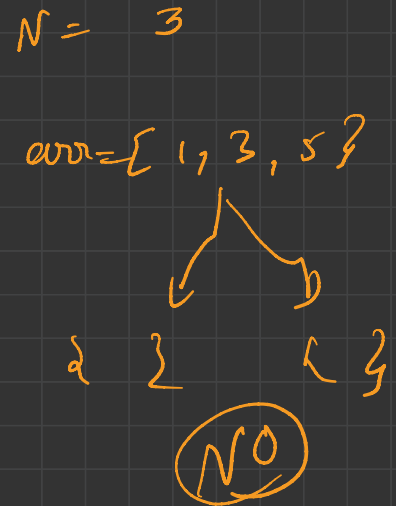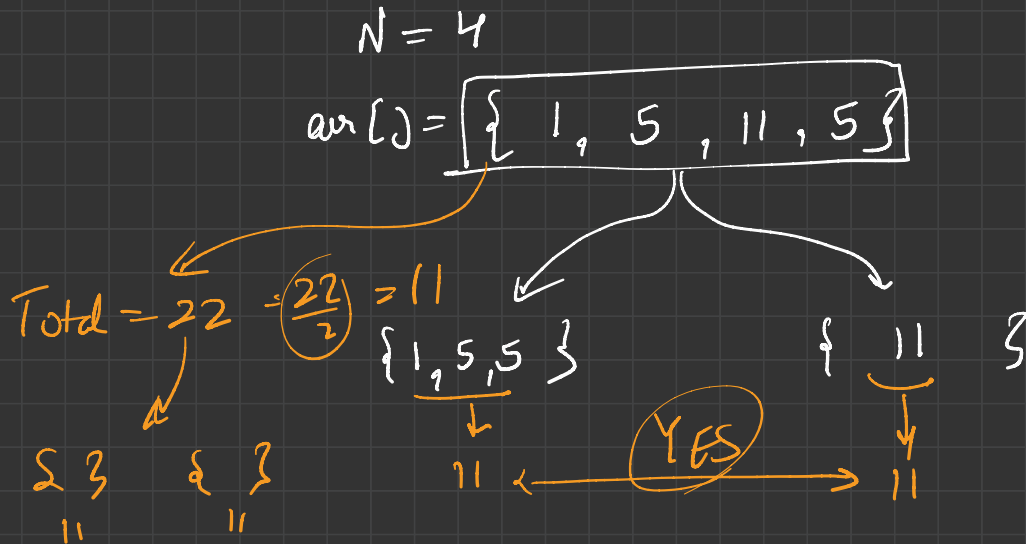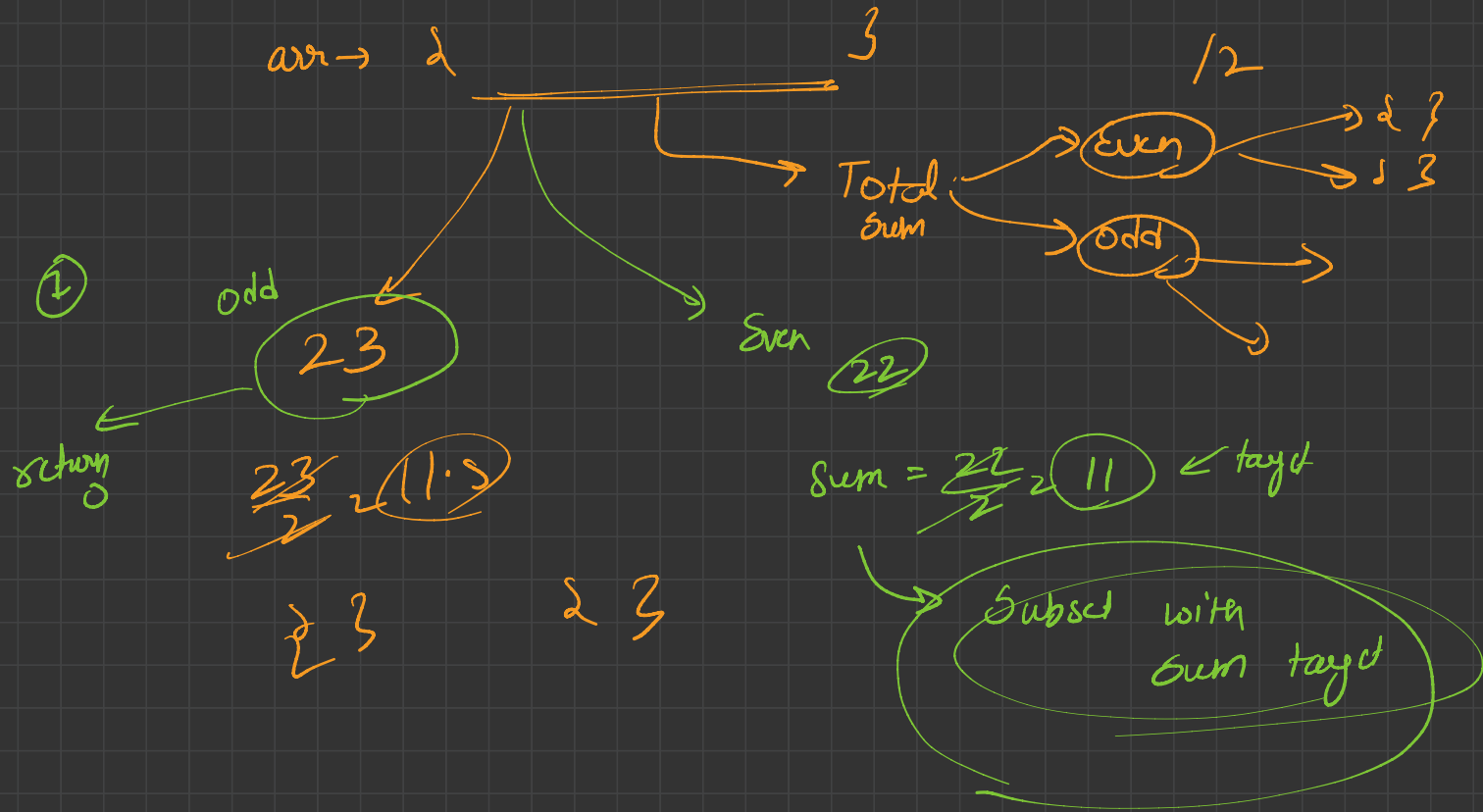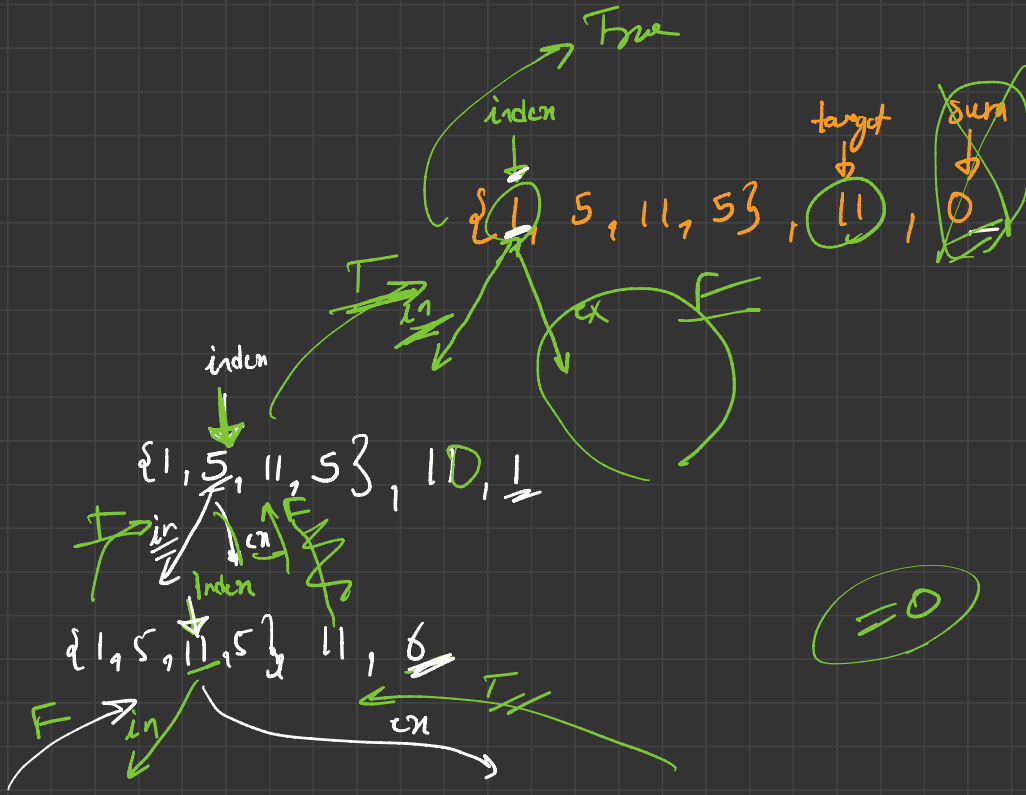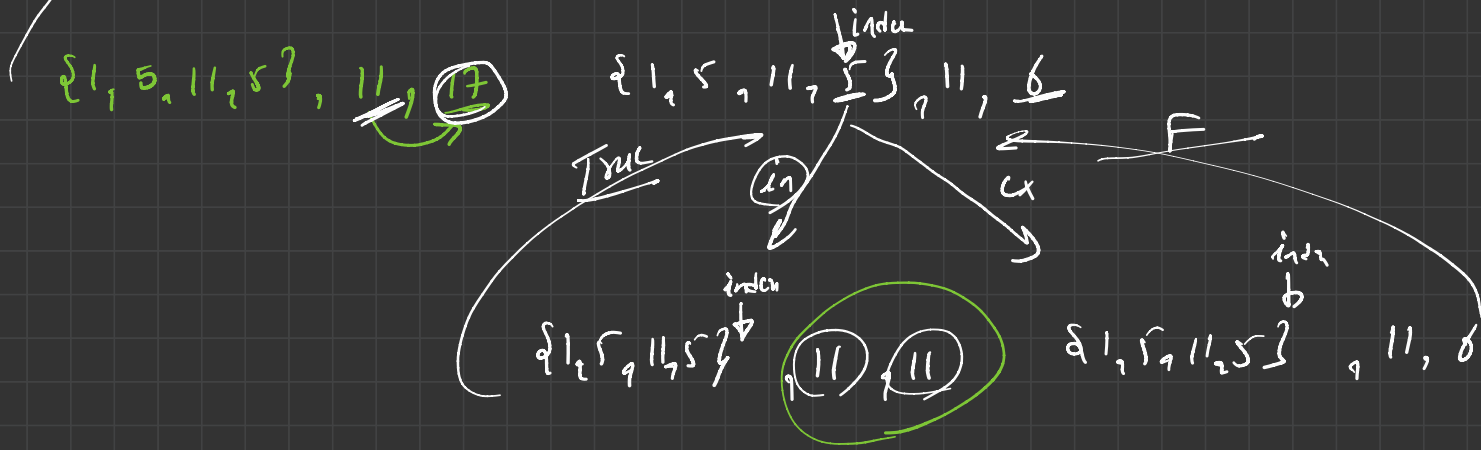
Top Down

index → $0 \longrightarrow N$

target → $total/2 \to 0$

Bottom-Up

$5 0 \to ?$

$dp\,[index]\,[target]$

$dp\,[index+1]\,[target-arr\,[index]]$

next

$dp\,[index+1]\,[target]$

next

curr

curr

$n-1^{th}\ index \longleftrightarrow curr$

$next = curr$

next

$n^{th}\ index \longrightarrow next$