

$v_{ls} =$

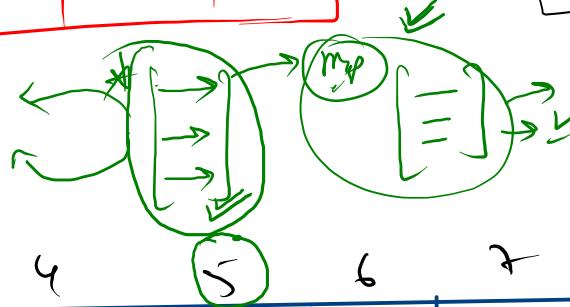
0	1	2'	3	4
15	14	10	45	30

\rightarrow

$(O_f) \Rightarrow \underline{\underline{l}}$

$w_{ls} =$

0	1	2'	3	4
2	5	1	3	9



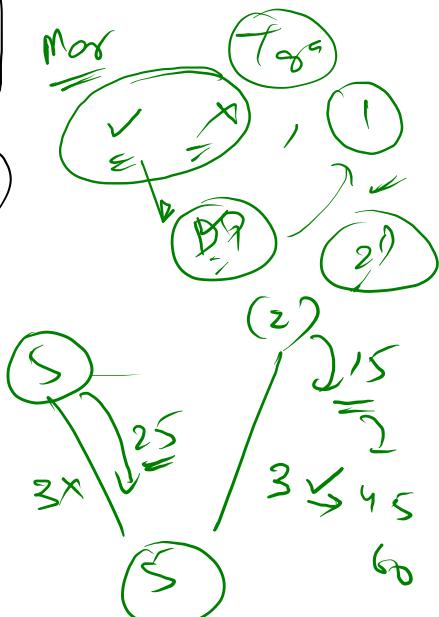
$wt \quad rl$

0	0	0	0	0	0	0	0
0	0	15	15	15	15	15	15
0	0	15	15	15	15	15	29
0	10	15	25	25	25	25	29
0	10	15	45	55	60	70	80
0	10	15	45	55	60	70	80

$\Rightarrow \times \times \times \rightarrow 1000$

0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0
0	0	15	15	15	15	15	15
0	0	15	15	15	15	15	29
0	10	15	25	25	25	25	29
0	10	15	45	55	60	70	80
0	10	15	45	55	60	70	80

$\cancel{25} \rightarrow 25$



```

int dp[][] = new int[n+1][cap+1];

for(int i = 1 ; i <= n ; i++){
    int wt = wts[i-1];
    int vl = vls[i-1];
    for(int j = 1 ; j <= cap ; j++){
        dp[i][j] = dp[i-1][j]; // exc
        if(j >= wt){
            // inc
            dp[i][j] = Math.max(dp[i-1][j-wt] + vl, dp[i][j]);
        }
    }
}

System.out.println(dp[n][cap]);

```

$VLS = \begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 15 & 14 & 10 & 95 & 30 \end{matrix}$ $Cap = 2$

$WTS = \begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 2 & 5 & 1 & 3 & 4 \end{matrix}$

$vL = 14$ $wT = 5$

	0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0	0
1	0	0	15	15	15	15	15	15
2	0	0	15	15	15	15		
3	0							
4	0							
5	0							

DP Table:

	0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0	0
1	0	0	15	15	15	15	15	15
2	0	0	15	15	15	15		
3	0							
4	0							
5	0							

Final Result: 15

Three red outlines of the uppercase letter 'E' are arranged vertically. The top outline is a simple oval. The middle outline is a more complex shape with a vertical stem and a horizontal crossbar. The bottom outline is another simple oval.

\Leftarrow Otysa

0	1	2	3	4
15	14	10	45	30

Cap = 9

0	1	2	3	4
2	5	1	3	4

wb ⚡

$$\overline{M \leq 30} \quad \overline{Wt = 4}$$

A hand-drawn diagram on a whiteboard. It features three overlapping circles. The top-left circle contains the letters 'CCC'. To its right, another circle contains the word 'Combi'. Below the 'CCC' circle, a third circle contains the letters 'CC Pennu'. To the right of the 'CC Pennu' circle, a fourth circle contains the letters 'P.W.'. The circles overlap significantly, with some lines extending beyond the circles' boundaries.

0	1	2	3	4 ^o	5	6
0	10	20	45	55	65	90

I_2

$I_2 \cdot I_3 \cdot I_6$

J_0 J_{α_0} J_{β_0}

105

233

233

18

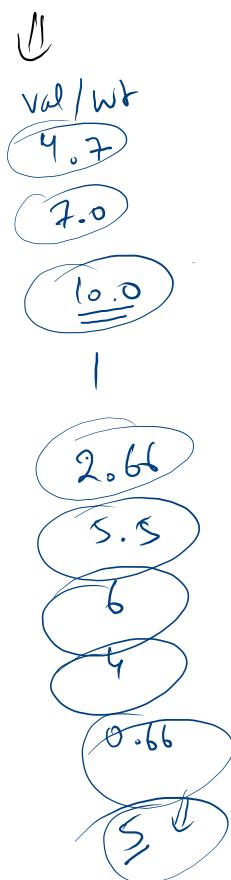
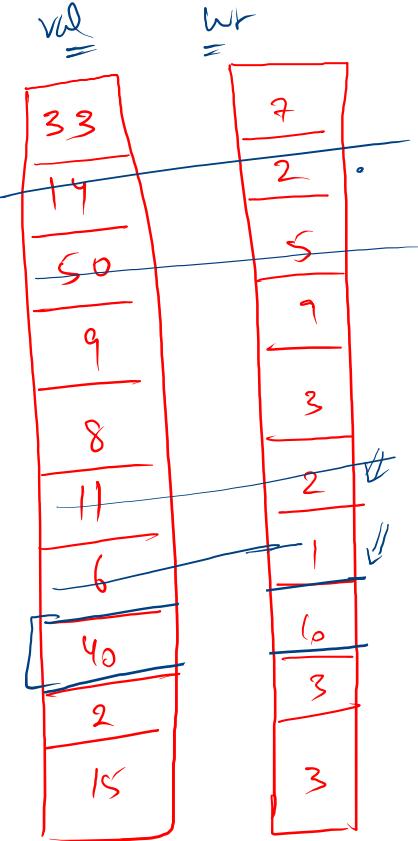
$$\begin{array}{r}
 P \\
 \hline
 2\ 3\ 3 \rightarrow 8 \\
 3\ 2\ 3 \rightarrow 8 \\
 \hline
 3\ 3\ 2 \rightarrow 8
 \end{array}$$

my two

Only 1 ↘

→ 0

Caps ↘



$$\begin{cases} \text{lp} = 4 \times 0 \\ \text{val} = 4_0 \end{cases}$$

lp → 11.648 × 0
val → 8 11 20 81 86 = ↘

more val / wt

↳ 1. more value while less space consumption

```

public static class Item{
    int vl,wt;
    Double vwr;
}
public static void main(String[] args){
    Scanner scn = new Scanner(System.in);

    int n = scn.nextInt();

    int vls[] = new int[n];
    for(int i = 0 ; i < n ; i++)
        vls[i] = scn.nextInt();

    int wts[] = new int[n];
    for(int i = 0 ; i < n ; i++)
        wts[i] = scn.nextInt();

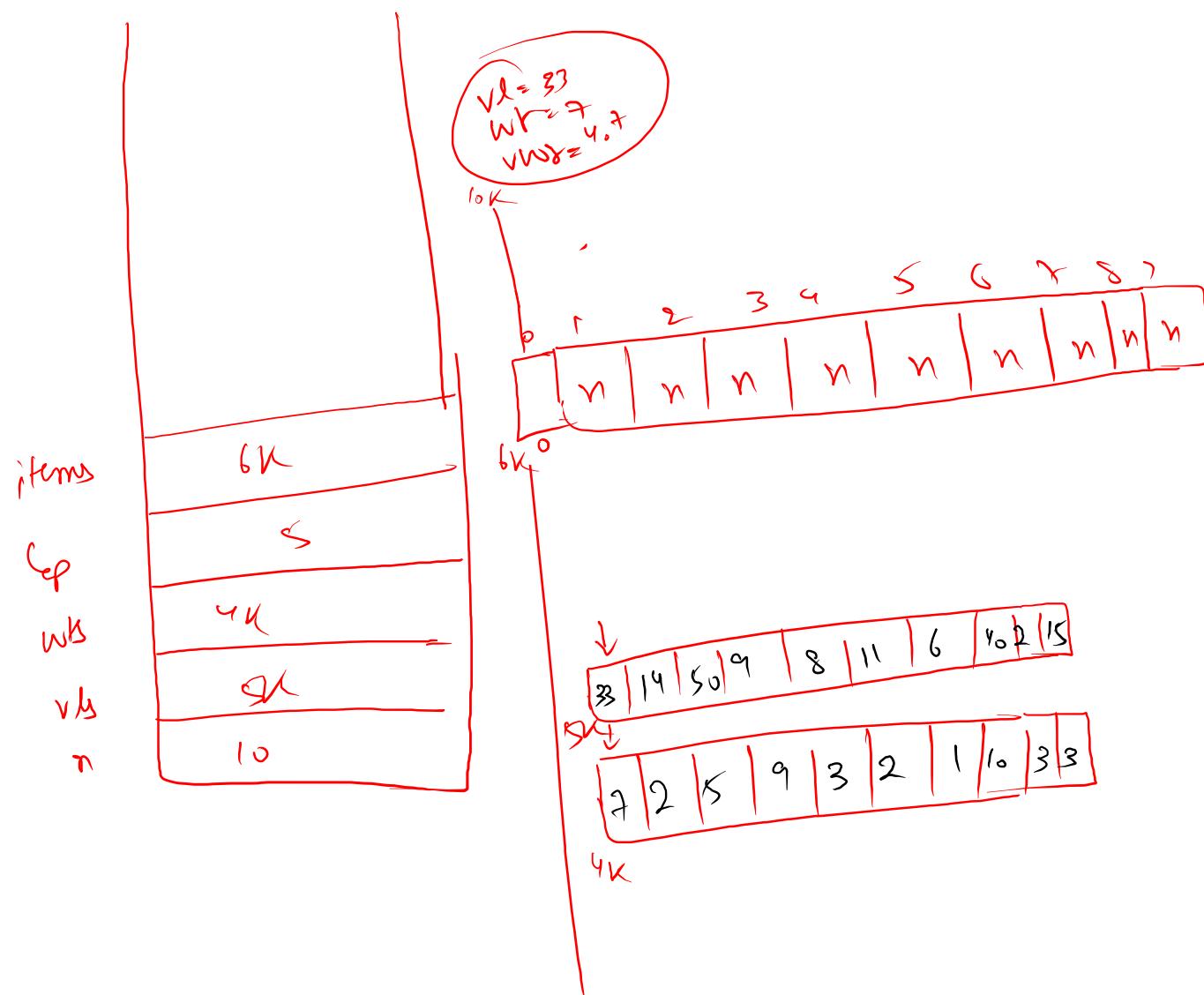
    int cap = scn.nextInt();

    // logic

    Item items[] = new Item[n];

    for(int i = 0 ; i < n ; i++){
        items[i] = new Item();
        items[i].vl = vls[i];
        items[i].wt = wts[i];
        items[i].vwr = (vls[i]*1.0) / wts[i];
    }
}

```



<u>idx</u>	<u>v</u>	<u>w</u>	<u>v/w</u>
0	33	7	4.7
1	14	2	7
2	50	5	10
3	9	9	1
4	8	3	2.66
5	11	2	5.5
6	6	1	6
7	10	10	1
8	2	3	0.66
9	15	3	5

<u>idx</u>	<u>v</u>	<u>w</u>	<u>v/w</u>
0	50	10	5
1	14	2	7
2	6	1	6
3	11	2	5.5
4	15	3	5
5	33	7	4.7
6	10	10	1
7	8	3	2.66
8	9	9	1
9	2	3	0.66

cap = 10 tval = 0

~~if cap > 0~~

```

int idx = 0 , tval = 0;
while(idx < n && cap != 0){
    if(items[idx].wt <= cap){
        cap -= items[idx].wt;
        tval += items[idx].vl;
        idx++;
    }else{
        tval += cap * items[idx].vwr;
        cap = 0;
    }
}
System.out.println(tval);

```

$(6) \Rightarrow n$

Sample Output
21

Binary
0 1

2L Binary

00
01
10
11

3L Binary

000
001
010
011

100
101
110
111

1 L Binary

0

1

2L Binary

0̄1

1̄0

1̄1

3 Binary

0̄1̄0

0̄1̄1

1̄0̄1

1̄0̄0

1̄1̄1

4 Binary

✓ 0̄1̄0̄1

✓ 0̄1̄1̄0

✓ 0̄1̄1̄1

✓ 1̄0̄1̄0

✓ 1̄0̄1̄1

✓ 1̄1̄0̄1

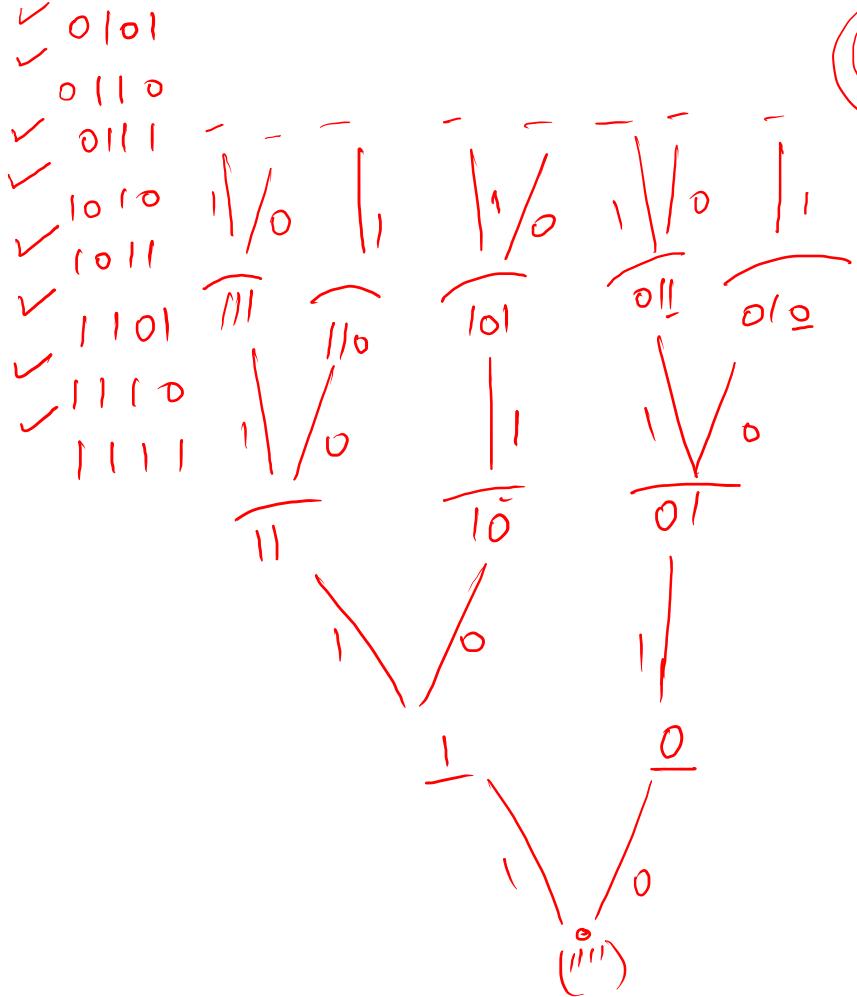
✓ 1̄1̄1̄0

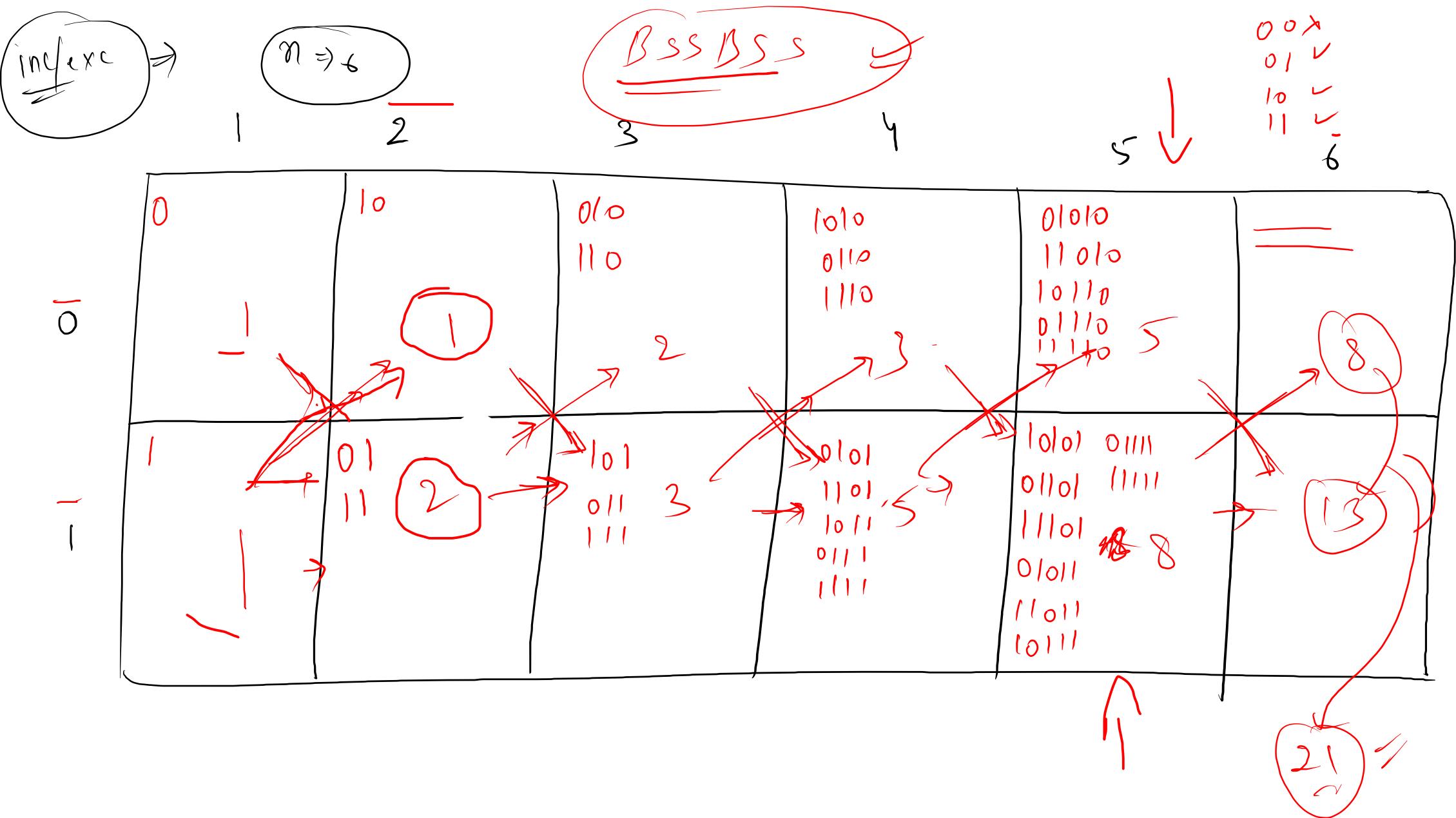
✓ 1̄1̄1̄1

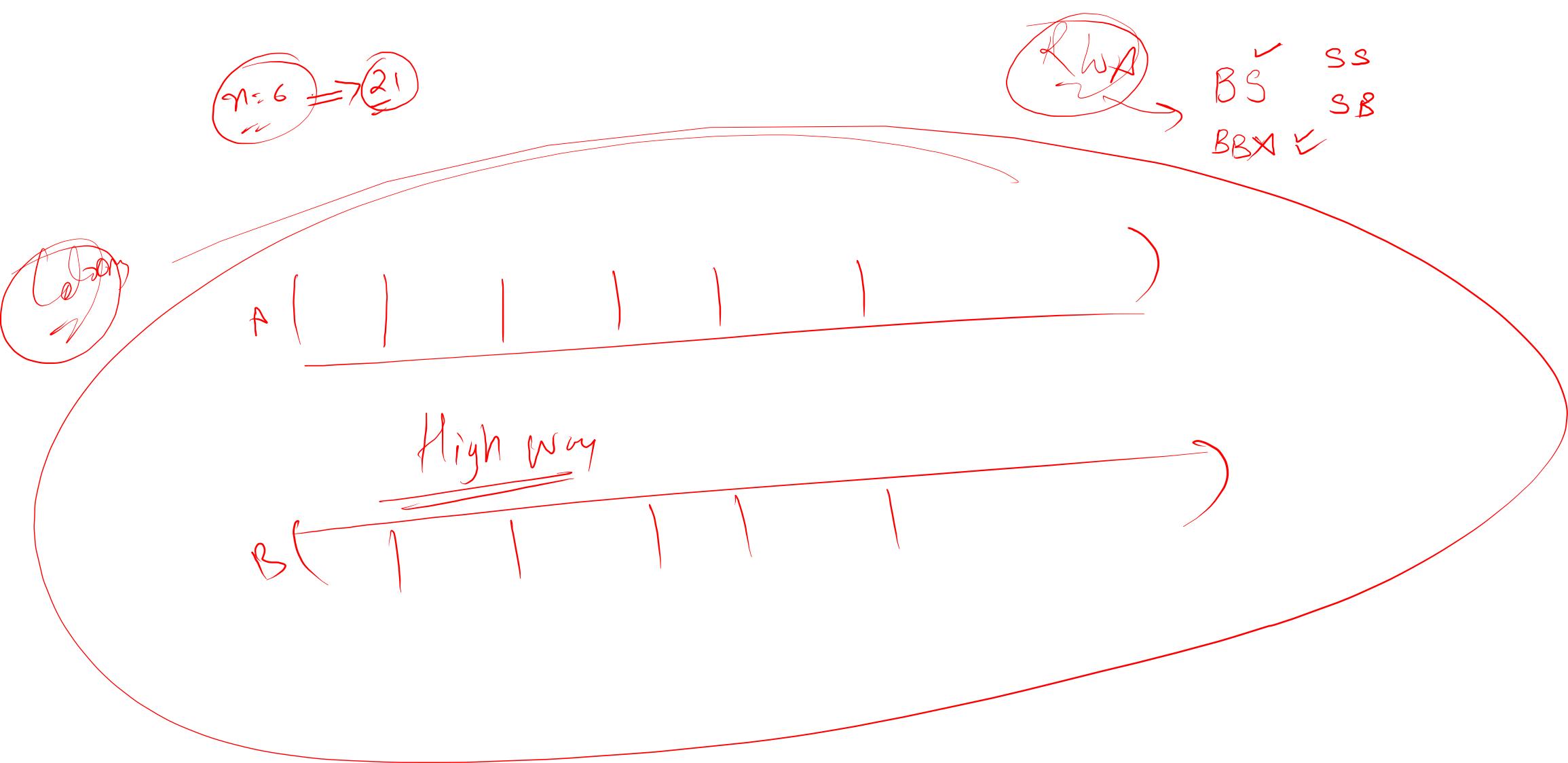
No Consecutive 0's

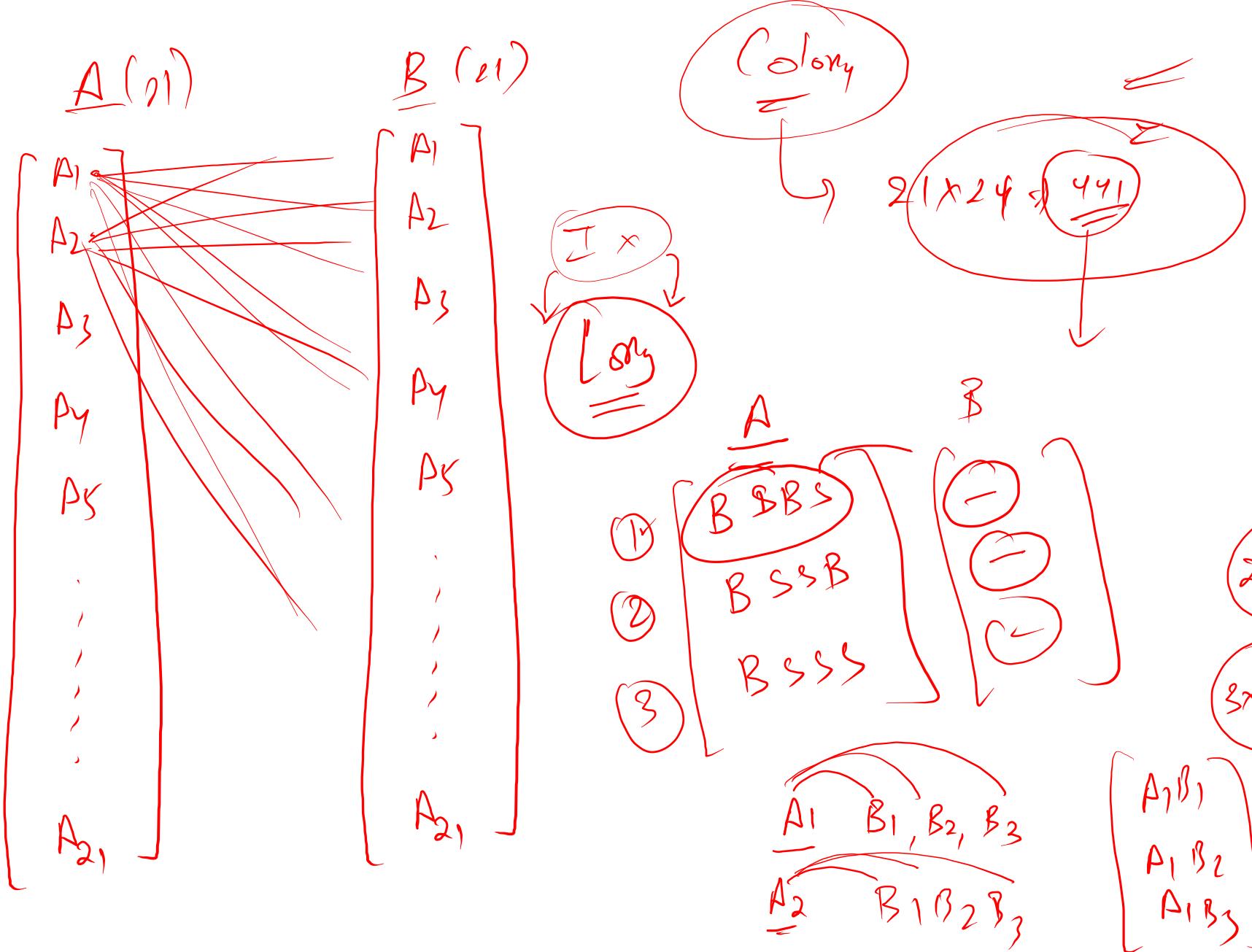
Count

Find Count of valid strings
length $\leq n$



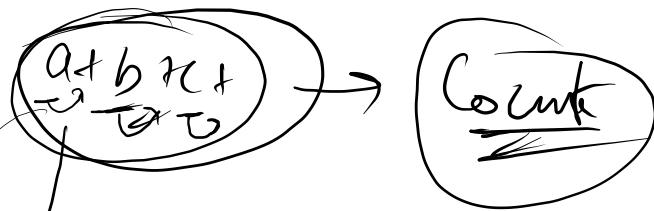






abcabc

Tac a c
a c a c →



a b b c ✓

ab a c →

aa ab ccc ✓

aa a ccc →

aa b b c c ✓

aaa bbb ccc ✓

	a	b	c	a'	b'	c'	
$\text{111} + a \rightarrow \text{111}_{\text{on}}$	0	\bar{a}	$0 + 0 + 1 \Rightarrow 1$	a	1	1	
$a + b \nmid$	0	$-$	ab	$0 + 0 + 1 \Rightarrow 1$	ab	1	3
$a+b+c \nmid$	0	$-$	abc	$0 + 0 + 1 \Rightarrow 1$	abc	1	5

Annotations and circled numbers:

- Top left: Circled $(6, 25)$ with arrows pointing to a , b , and c .
- Top right: Circled $(5, 29)$ with arrows pointing to a' , b' , and c' .
- Row 2, Column 1: Circled 0 with a red arrow pointing to it.
- Row 2, Column 2: Circled 0 with a red arrow pointing to it.
- Row 2, Column 3: Circled 0 with a red arrow pointing to it.
- Row 2, Column 4: Circled 1 with a red arrow pointing to it.
- Row 2, Column 5: Circled 1 with a red arrow pointing to it.
- Row 2, Column 6: Circled 3 with a red arrow pointing to it.
- Row 2, Column 7: Circled 3 with a red arrow pointing to it.
- Row 3, Column 1: Circled 0 with a red arrow pointing to it.
- Row 3, Column 2: Circled 0 with a red arrow pointing to it.
- Row 3, Column 3: Circled 0 with a red arrow pointing to it.
- Row 3, Column 4: Circled 1 with a red arrow pointing to it.
- Row 3, Column 5: Circled 1 with a red arrow pointing to it.
- Row 3, Column 6: Circled 3 with a red arrow pointing to it.
- Row 3, Column 7: Circled 5 with a red arrow pointing to it.
- Row 4, Column 1: Circled 0 with a red arrow pointing to it.
- Row 4, Column 2: Circled 0 with a red arrow pointing to it.
- Row 4, Column 3: Circled 0 with a red arrow pointing to it.
- Row 4, Column 4: Circled 1 with a red arrow pointing to it.
- Row 4, Column 5: Circled 1 with a red arrow pointing to it.
- Row 4, Column 6: Circled 1 with a red arrow pointing to it.
- Row 4, Column 7: Circled 5 with a red arrow pointing to it.
- Right side: A vertical column of circled numbers $(1+1+5)$, (2) , (5) , $(1+1+3)$, and (5) with arrows pointing to them.
- Bottom right: A bracketed group of equations: $a \Rightarrow 2a+1$, $b \Rightarrow 2b+a$, and $c \Rightarrow 2c+b$.

