

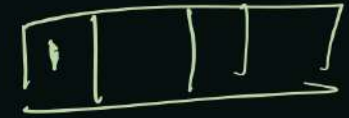
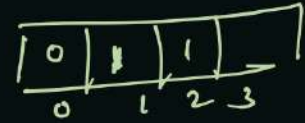
Count Binary Strings

Saturday, 1 May 2021 12:54 PM

length of string = 4

no. of possible binary string = $2^4 = 16$

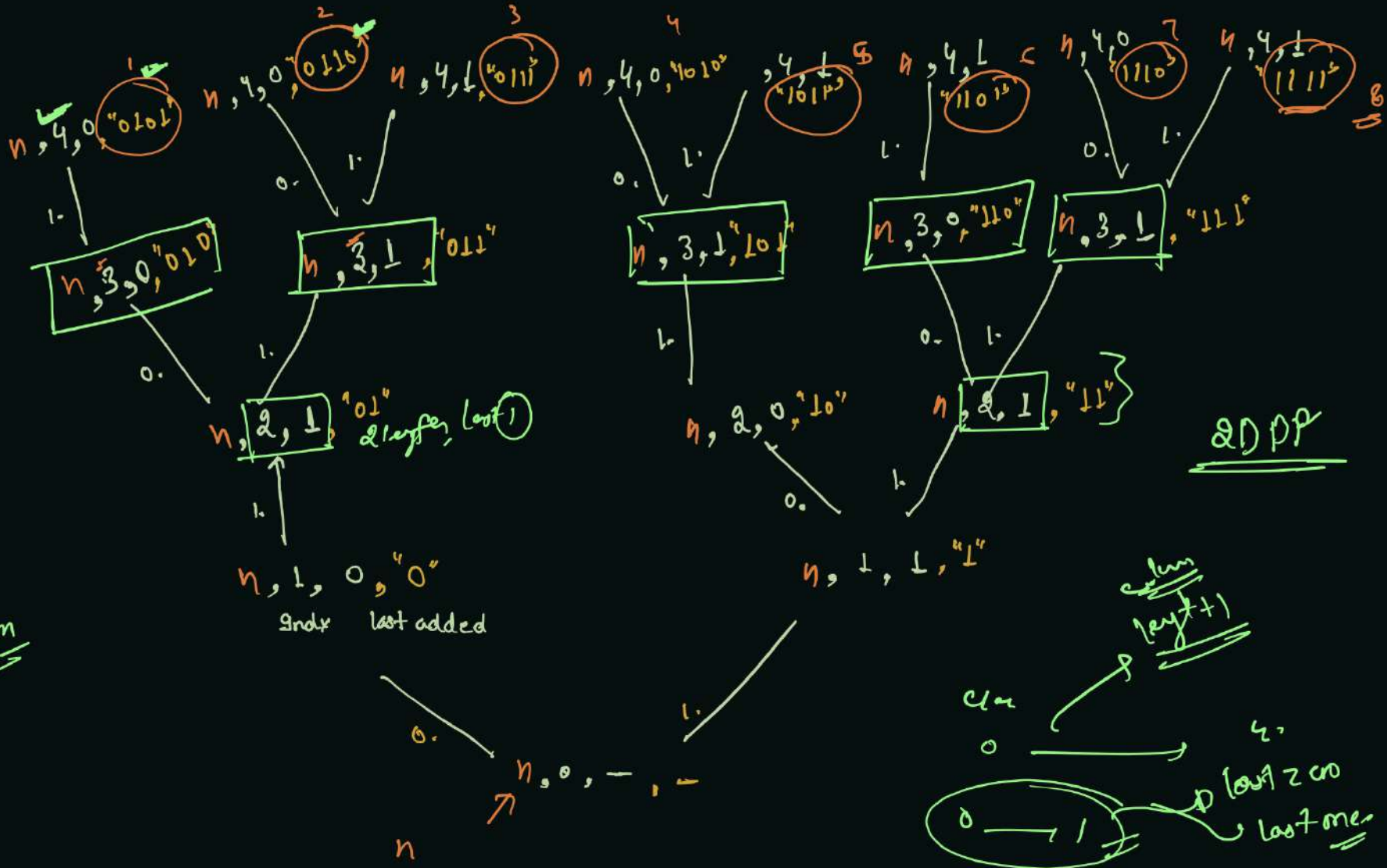
constraint \rightarrow No two consecutive 0s are allowed



First call

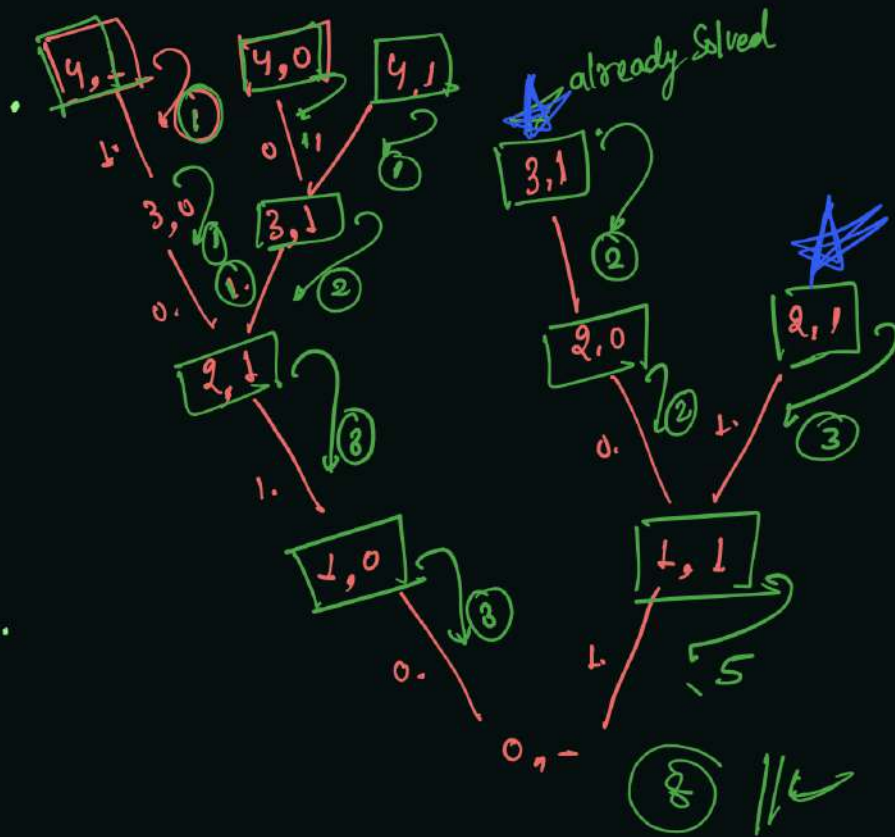
like can add 0, 1 on 0th index

count - Recursion



Count Binary String. Memo → length: 4

clp	0	1	2	3	4
0		3	2	1	1
1		2	3	2	1



```
public static int countBinaryStrings_memo(int clen, int n, int le, String str, int[][] dp) {
    if(clen == n) {
        return dp[le][clen] = 1;
    }

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

    int count = 0;
    System.out.println(clen + " " + le);
    if(le == 0) {
        count += countBinaryStrings_memo(clen + 1, n, 1, str + "1", dp);
    } else {
        count += countBinaryStrings_memo(clen + 1, n, 0, str + "0", dp);
        count += countBinaryStrings_memo(clen + 1, n, 1, str + "1", dp);
    }

    return dp[le][clen] = count;
}

public static void countBinaryString() {
    int n = 6;
    // int count = countBinaryStrings_rec(1, n, 0, "0");
    // count += countBinaryStrings_rec(1, n, 1, "1");

    int[][] dp = new int[2][n + 1];

    int count = countBinaryStrings_memo(1, n, 0, "0", dp);
    count += countBinaryStrings_memo(1, n, 1, "1", dp);
    System.out.println(count);
}
```

Count Binary String. tabulation -

fibon
No need for DP

- 1) DP
- 2) Meaning-
- 3) travel and fill

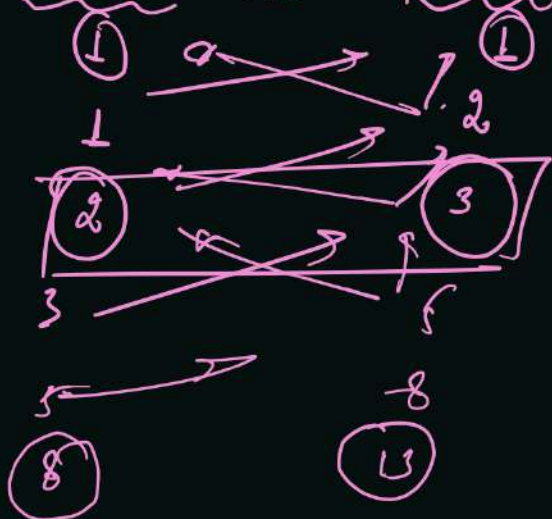
* → Max. possible answer if length is 3 and last added element is 0

	1	2	3	4	5	6
0	0	10	010 110	1010 0110 1110		
1	1	01 11	101 011 111			

answer $\Rightarrow 8 + 13 = 21$

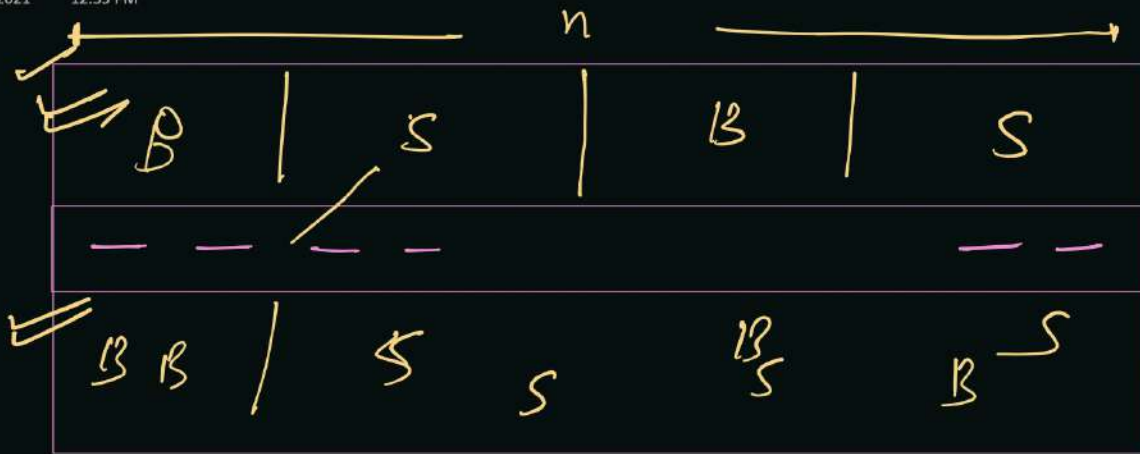
Last zero Count 00 = old 2
Last one Count 01 = old 2

- 1 →
- 2 →
- 3 →
- 4 →
- 5 →
- 6 →



Arrange Buildings

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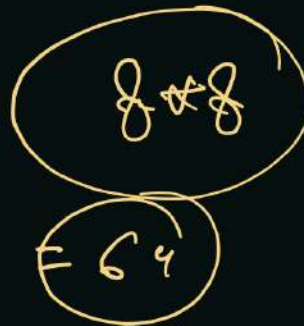
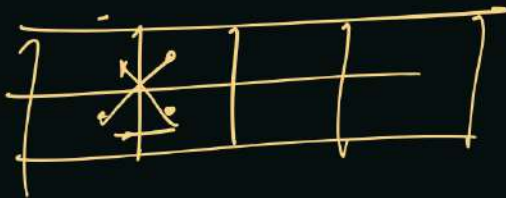


total no. of ways
to arrange
building as well
as space.

Condition!

No. too building
can be placed
on adjacent.

0 \rightarrow Building
1 \rightarrow space

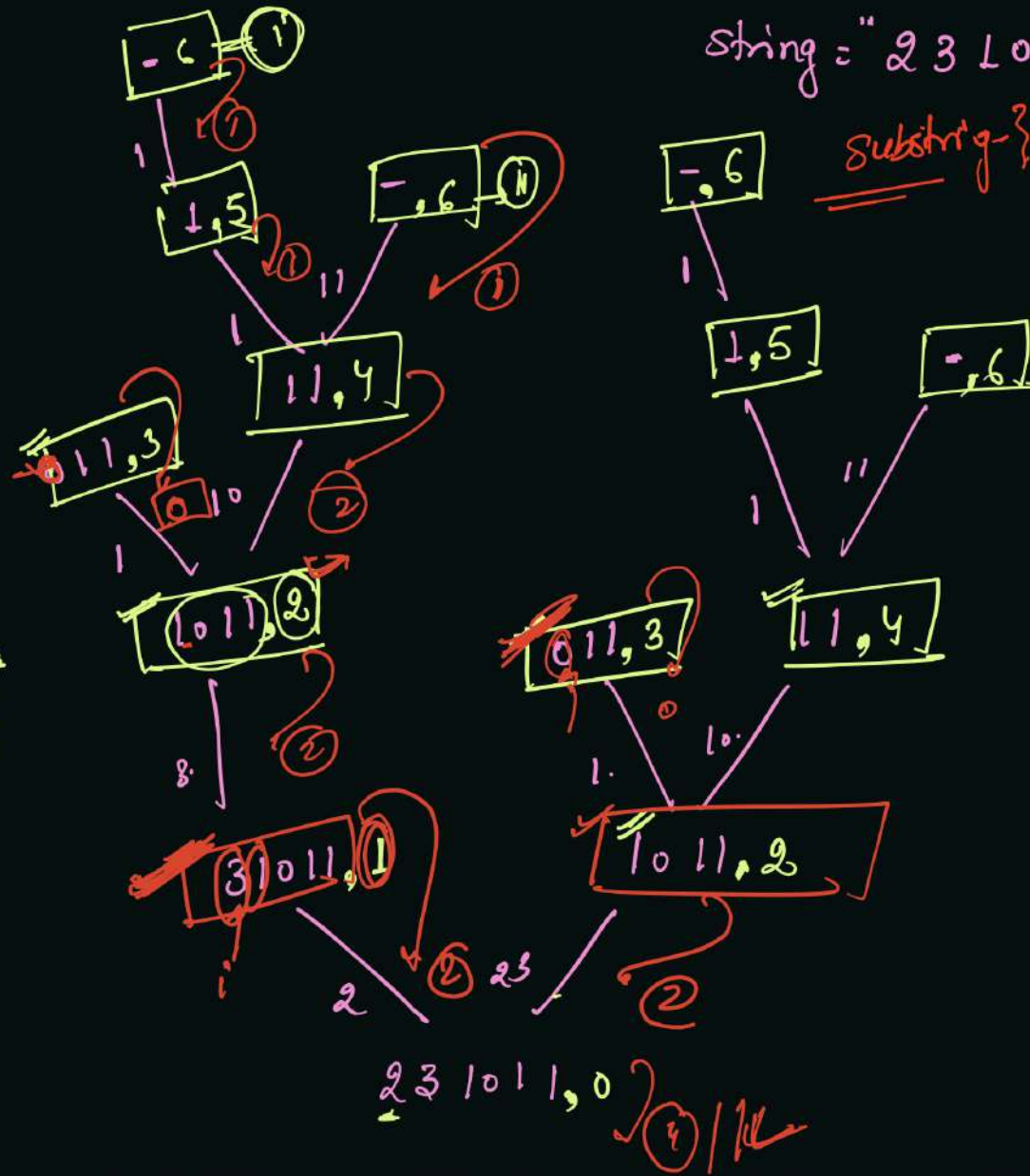
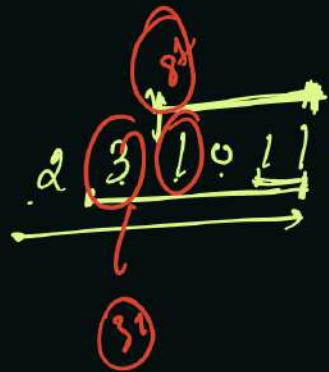


8	1	0101
8	2	0110
8	3	0111
8	4	1010
	5	1011
	6	1101
	7	1110
8	8	1111

Count Encodings

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2-3-10-11



String = "231011"

substring - { continue }

String length 6

all length are uniquely mapped with string.

231011 } 4 possible arrangements

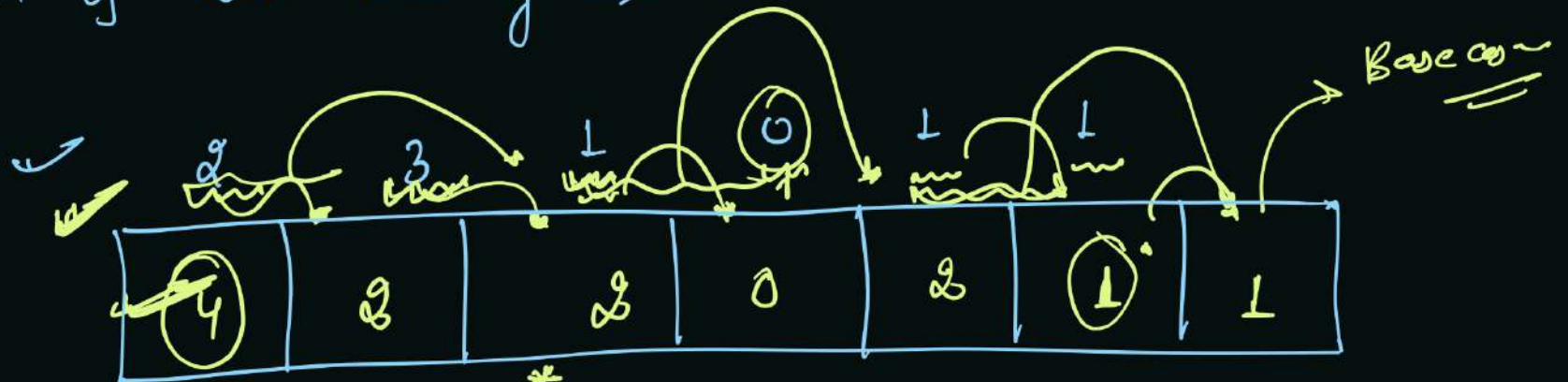
1 → L

2 → 11

3 → 011

4 → L011

tabulation of Count Encoding \rightarrow



Decoding \rightarrow No. of possible
Encoding starting from
index i to end.