

## PROBLEM E: LADDER

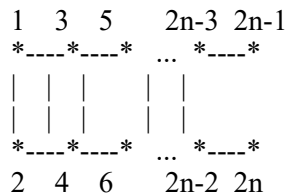
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**Input file:** LAD.IN

**Output file:** LAD.OUT

### Problem

An  $n$ -ladder is the undirected graph shown in the figure below.



More formally an  $n$ -ladder,  $n \geq 1$ , is the graph  $L_n = (V_n, E_n)$  where

$V_n = \{1, 2, \dots, 2n\}$  and

$E_n = \{ (i)-(i+1) : i = 1, 3, \dots, 2n-1 \} \cup \{ (i)-(i+2) : i = 1, 2, \dots, 2n-2 \}.$

Each edge of the ladder is colored white or black. We are given an integer  $k$ . What is the number of spanning trees in  $L_n$  with exactly  $k$  black edges?

Write a program that:

- reads from the text file LAD.IN
  - a positive integer  $n$ ,
  - a number  $b$  of black edges in the ladder  $L_n$ ,
  - descriptions of black edges,
  - a nonnegative integer  $k$ ;
- computes the number of spanning trees in  $L_n$  with exactly  $k$  black edges;
- writes the result to the text file LAD.OUT.

### Input

The first line of the input file LAD.IN contains an integer  $n$ ,  $1 \leq n \leq 15$ .

The second line of the input file contains an integer  $b$ ,  $0 \leq b \leq 3n-2$ . This is the number of black edges in the ladder  $L_n$ .

The following  $b$  lines contain  $b$  pairs of integers.

Integers in each pair are separated by a single space.

Integers  $a_i, b_i$  of the  $i$ -th pair (in line  $i+2$ ) are ends of a black edge in  $L_n$ .

The last line of the input file contains an integer  $k$ ,  $0 \leq k \leq 2n-1$ .

### Output

Your program should write the number of spanning trees in  $L_n$  with exactly  $k$  black edges to the first line of the output file LAD.OUT.

**Example**

***Input file***

2  
2  
1 2  
3 4  
1

***Output file***

2