



Task Drzava

In a distant land called Airlanvaosma-i there are n cities connected by $n - 1$ roads. It is possible to reach every city from any other city by passing through fewer than 36 roads.

The almighty Krešimir wants to found his own state. Krešimir's state must have one capital city from which the state is governed, and several (possibly none) secondary cities that are under its administration. The size of a state is equal to the **total** number of cities that belong to that state (the capital city and all secondary cities).



However, in order for the governance of the state to be efficient, Krešimir imposes the following rule:

- for every secondary city, on the path from the capital city to that secondary city there must be **no** other secondary city. In other words, no secondary city may lie between the capital city and another secondary city.

For every state size k , where $1 \leq k \leq n$, determine how many different states of size k the almighty Krešimir can found. Since these numbers can be very large, output them modulo $10^9 + 7$.

Two choices of states are considered different if they differ in at least one chosen secondary city or in the choice of the capital city.

Input

The first line contains a natural number n ($1 \leq n \leq 3000$), the number of cities in the land.

In the next $n - 1$ lines there are two natural numbers u and v ($1 \leq u, v \leq n, u \neq v$), which indicate that cities u and v are connected. It will be possible to reach every city from any other city.

Output

In the first and only line output n numbers, the numbers described in the problem statement.

Scoring

Subtask	Points	Constraints
1	18	$1 \leq n \leq 15$
2	17	$1 \leq n \leq 200$
3	26	$1 \leq n \leq 600$
4	49	No additional constraints.



Sample tests

input

```
4
1 2
1 3
1 4
```

output

```
4 12 6 1
```

input

```
4
1 2
2 3
1 4
```

output

```
4 12 4 0
```

Explanation of the second sample test: There are 4 states of size 1 because there are 4 choices for the capital city. There are 4 states of size 2 because after choosing the capital city (4 ways), we also choose 1 secondary city (3 ways). There are 4 states of size 3 because by choosing capital cities 1 or 2 we have 2 ways each to choose 2 additional secondary cities.