

Tie Some Loose Ends

The Protagonist is about to leave Indonesia — not just to chase a dream, but to rewrite his family's fate. It's a journey that demands everything he has, and he's spent his whole life preparing for it.

Throughout the years, The Protagonist was blessed with many great friends — some still close, others long disconnected. Each of them played a part in shaping who he is. After all, ***we are mosaics — built from every soul we've ever loved.***

Now, as he prepares to leave, he sees his life as a graph: each friend a node, each memory an edge. But time has split the **graph** into **separate parts**. Some **edges** have frayed. Some connections were never rebuilt.

Before he leaves, The Protagonist wants to **reconnect** — to tie the loose ends. He can only make a limited number of reconnections to link these **components** together. And there's **one** connection in particular — a person he once shared an extraordinary bond with. His closest friend. The one he never dared to love out loud. The one he might never meet again after this.

She was his constant, the one who knew him better than anyone else outside his family. Over time, they drifted. He's unsure where they stand now. But if he's going to leave without regrets, he knows he must try.

To reach her there must be a certain condition that he has to meet, as he is running out of time.

Help him with the journey to reconnect will take effort, choices, and energy. But if he succeeds, the Web of Fate might just feel whole again — one last time before goodbye.

And so, he sets out to **rebuild** what he can.

To solve this, imagine the lives of his friends as an undirected graph. Each friendship is an edge, each person a node. Over time, some connections disappeared, leaving the graph **disconnected** — split into several **connected components**.

The Protagonist is **not in the input** — he is a **separate component**. Neither is **She**, the one he wants to reach. She too is **disconnected** from everyone. That means:

Total Components = Connected Components in the Input + 2 (The Protagonist and Her)

To **tie the loose ends**, The Protagonist must **connect all these components into one connected graph**. Each reconnection (edge between any two components) **costs 1 energy**.

So, to connect C components into one whole, he must spend $C - 1$ energy.

But to **reach Her**, there's **one more condition**:

After tying all the components (including The Protagonist), he must still have **at least 1 energy** left to reach her — to finally speak, one last time.

So, the final condition is:

- He needs **$(C - 2)$** energy to connect all components **excluding Her**,
- Then **1 more energy** to reach her.

CONSTRAINTS:

- $2 \leq N \leq 1000$ (number of friends)
- $0 \leq M \leq 5000$ (number of edges)
- $0 \leq \text{energy} \leq 20000$

INPUTS:

- First line: $N \ M$
- Next M lines: each line contains two strings `friend1 friend2` indicating an existing connection
- Last line: one integer — total energy The protagonist has

OUTPUTS:

- `"You tied the loose ends and reached her."` — if The protagonist can connect all components using \leq energy, **and** have at least 1 energy left to connect The protagonist to Her

- "You tied the loose ends but couldn't reach her." – if The protagonist can connect all components but has **no** energy left to connect The protagonist to Her
- "You didn't tie the loose ends. She remains out of reach." – if The protagonist cannot connect all components within energy limit

SAMPLE INPUT/OUTPUT:

Example 1:

INPUT:
15 9 Tk Rfq Tk Rf Dn Ryh Dvn Dn Vn Ghf Vin Sn Dzk Ryn Iqb Fz Mz Ndra 10
OUTPUT:
You tied the loose ends and reached her.

Example 2:

INPUT:
10 5 Ali Budi Cindy Dika Eka Farhan Gita Hanif Indra Joko 3
OUTPUT:
You didn't tie the loose ends. She remains out of reach.