PROBLEM STATEMENT

All the new-joinees of Parabole are eagerly waiting for a welcoming address from Rajdeep, the very famous and whimsical scientist of Parabole R&D. It is also whispered around the room that Rajdeep is a bit mad. After being an hour late, suddenly Rajdeep rushes into the room with disheveled hair and his shirt unbuttoned, shouting angrily at the very confused newbies.

When Saurav goes to understand the angst of Rajdeep, trying to handle the situation, Rajdeep spills the beans. He has a new idea, but he is struggling to materialize it.

Rajdeep's new idea is that everything in nature is inherently connected. He is trying to create a knowledge graph from everything he reads around himself. He calls (read: shouts) the new-joinees to help him devise an algorithm which can extract the relationships from English sentences.

Help Rajdeep devise an algorithm to create knowledge graph from a list of sentences.

Check out the following examples for a better understanding of the problem statement.

Example

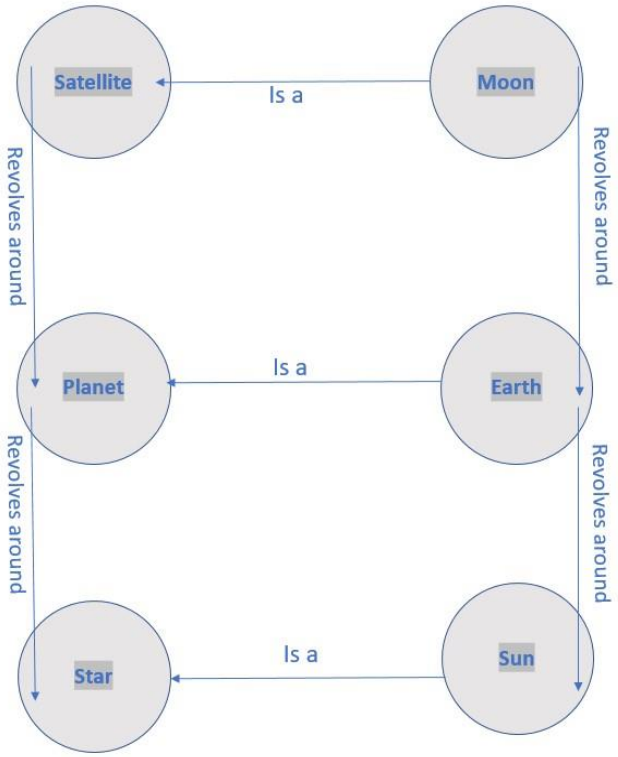
Input

1.
   a. Planet revolves around stars.
   b. Satellites revolve around planets.
   c. Sun is a star.
   d. Earth revolves around sun.
   e. Moon revolves around earth.

Inference

1. The Moon is a Satellite which revolves around Earth which is a Planet. Earth revolves around Sun, which is a Star.

Knowledge Graph



Output

The output is a list of triples, which defines the relationship object and subject as well as the relationship between them. Look into this example output to have a better understanding. There is no fixed order for the list of triples.

1.
    - Moon, Is a, Satellite
    - Earth, Is a, Planet
    - Sun, Is a, Star
    - Planet, Revolves around, Star
    - Satellite, Revolves around, Planet
    - Moon, Revolves around, Earth
    - Earth, Revolves around, Sun

For more instructions, please refer to Instructions.pdf.