

## 2 Connecting islands

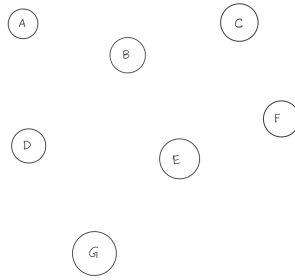


Figure 1: A figure representing the seven islands of the kingdom.

The kingdom of Phoolpatti has seven islands (see fig. 1). People travel between the islands using boats. However, bad weather during monsoon prevents most of the boats from functioning. The monsoon has just passed and it saw some islands struggling with healthcare and other facilities which are better at the other islands. To prevent this, the queen of Phoolpatti comes up with an ambitious plan, called “Project P ālam”. Before the next monsoon arrives, she wants to build bridges between the islands so that one can go by road from any island to any other island.

Each bridge connects at most two islands (see figs. 2 and 3) and costs Rs. 10,000 to build.<sup>1</sup> The queen gives her chief engineer Rs. 80,000 to build bridges which can connect all the islands. Give a configuration of bridges which costs at most Rs. 80,000 and can connect all the islands.

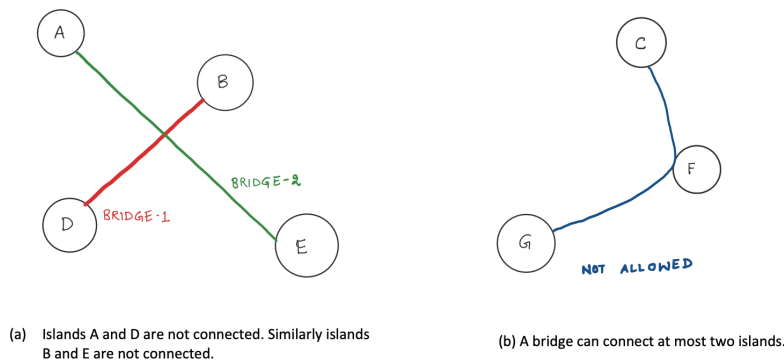


Figure 2

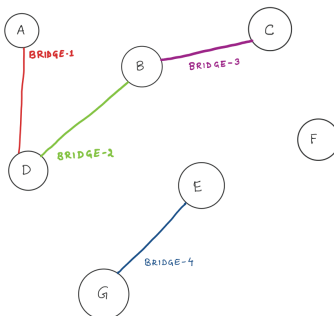


Figure 3: Islands A and B are connected via bridges 1 and 2. Similarly, islands A and C are connected via bridges 1, 2, and 3. Islands B and E are not connected.

As the chief engineer was working with the architects to implement the bridges’ configuration given by you, a sudden attack by the neighboring kingdom of Ghaasphoos took everyone by surprise. The queen orders all the ministers to act swiftly to protect the kingdom. The finance minister slashes the budget of all ongoing projects to save the falling economy. The budget of Project P ālam is reduced to Rs. 50,000.

The chief engineer is struggling to reconfigure all the bridges. She has now come to you for help. Should she go to the finance minister and ask for more budget? Don’t expect the minister to increase the budget in the middle of a war without a convincing argument! So, make sure you have one.

<sup>1</sup>As you might have realized, this story is from a few centuries ago.