

Problem of the Week

Problem D

Top Secret

Every Friday, five spies, Spy A, Spy B, Spy C, Spy D, and Spy E, share all of the information they have uncovered over the previous week. A spy can never be seen with more than one other spy at the same time. They must conduct several rounds of meetings where two pairs of spies meet at different locations in order to share all of the information they have to that point. In any round, there are always 2 meetings involving 4 of the spies. During a round one spy is not involved in any meeting. There are two methods to conduct the rounds of meetings.

In the first method, at some point on Friday each spy meets with every other spy directly. In their meeting, a spy shares only the information they gathered themselves during the previous week. They do not share information learned from other spies in previous meetings.

In the second method, when two spies meet each spy is able to reliably pass along all of the information learned in previous meetings plus their own information which they gathered in the previous week. That is, in any meeting each spy gets all of the information known to the other spy.

For each method, determine the minimum number of rounds of meetings required in order for each spy to learn all of the information gathered by each of the other spies during the previous week.

