There is a magic place called the Acient,animals and heros live a happy live here.

But one day, a strong and strange evil called doom came to this place.

Doom is so strong that no heros dare to say a word when he is eating our lovely animals(this is Doom’s favorite thing).

Luciky, the universal police called meepo come to save us, meepo has up to 4 parteners, you can assum that they are as strong as meepo(in fact, they are meepos too).Doom is strong , but Meepo have some magic power to end doom’s live,that means every single meepo can defeat doom,so doom get panic and start running for his life.

This place formed like a tree, that means it has n vertex and n-1 edges. Initially , doom and every meepo are at distinc places, in every minute, doom and every meepo can move to any adjacant places or just stay where he is. Meepos want to catch doom as soon as possible,you should know a single meepo will catch doom immediately when they appear at the same place. To make things simple, we define every second, doom makes a choice first, and then every meepo makes choice.

Both doom and meepos are clever, so the choose their way optimally. You should calculate the minimal time meepo can catch the doom.