

KNIGHTS AND KNAVES

On a certain island there are only two types of people: Knights and Knaves. Every person on the island is either is a Knight or a Knave, and no one is both. When the people on the island speak, the following rules hold:

- Knights always tell the truth.
- Knaves always lie.

Problem 1: There are two native islanders, named Alice and Bob, standing next to each other. You do not know what type either of them is. Suddenly, Alice says “At least one of us is a Knave.”

What are Alice and Bob?

Problem 2: Again, there are two native islanders standing next to each other. One is named Claire and the other is named Desmond. You do not know what type either of them are. Claire suddenly says, “We are both Knights”. After this, Desmond says “Either Claire is a Knight or I am a Knight, but we are not both Knights.”

What is Claire?

Is it possible to determine what Desmond is?

Problem 3: There are three native islanders, named Elena, Fernando, and Gary, standing together. You ask Elena, “How many knights are among you?”, and Elena answered but you couldn’t quite hear what she said. You then ask Fernando, “What did Elena say?”, and Fernando replies, “Elena said there is one knight among us.” At this point, Gary says “Don’t believe Fernando; he is lying.”

Is it possible to determine what Elena is?

Is it possible to determine what Fernando is?

Is it possible to determine what Gary is?

Problem 4: You travel along a road that comes to a fork producing a path to the right and a path to the left. You know that one path leads to Death and the other path leads to Freedom, but you have no idea which is which. You can only choose one path to follow. Fortunately, at the fork in the road are two native islanders, named Horace and Ingrid. You know that one of Horace and Ingrid is a Knight and the other is a Knave, but you don’t know which is which. You are allowed to ask only one question. You can ask either Horace or Ingrid (but not both), and the person you ask will answer you.

How can you ask a question that will allow you to determine the path to Freedom?