

CSE 103

Student ID : 1705044

Verifying Student ID: 1705074

Chapter: 1

Section: 2

Exercise: 30

Exercises 24–31 relate to inhabitants of an island on which there are three kinds of people: knights who always tell the truth, knaves who always lie, and spies (called normals by Smullyan [Sm78]) who can either lie or tell the truth. You encounter three people, *A*, *B*, and *C*. You know one of these people is a knight, one is a knave, and one is a spy. Each of the three people knows the type of person each of other two is. For each of these situations, if possible, determine whether there is a unique solution and determine who the knave, knight, and spy are. When there is no unique solution, list all possible solutions or state that there are no solutions.

30. *A* says “I am not the spy,” *B* says “I am not the spy,” and *C* says “*A* is the spy.”

Solution:

***A* is the knight, *B* is the spy, *C* is the knave.**

Here,

Knights: tell the truth.

Knaves: always lies.

Spies: either lies or tells the truth.

As knaves always lie, A and B cannot be knaves as then they will be telling the truth. Thus, C is the knave. As C is a knave, he is lying when he says A is the spy. Thus, A is the knight. We can then further assume that C is a (lying) spy.