ASSIGNMENT CSE 103 DISCRETE MATHEMATICS
CHAPTER 1 SECTION 2
DONE BY 1705002
TO BE VERIFIED BY 1705092

Question: (1::2::31)

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.

A says "I am not the spy," B says "I am not the spy," and C says "I am not the spy."

Answer:

It is possible for a knight to say "I am not the spy", for it is a truth for him/her. And it's also possible for a spy to say so, in this case s/he lies. But a knave will never say "I am not the spy", for he won't tell anything but lies. So, neither A nor B nor C can be a knave. But it follows from the question that exactly one of A, B, and C is a knave. This leads to contradiction. So, there can be no possible solution.