

Assignment #2

Due: Friday 20th of September, 2019 before 11:55 pm

Note:

1. Late submissions receive zero credit.
 2. If you write only the correct answer without steps you get very low credit.
 3. Submit in hard form.
 4. Do not knock at the door. Just slide beneath the door.
 5. Total marks are 45
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Q:- 2 The following exercise relates to the inhabitants of the island of knights and knaves created by Smullyan where Knights always tell the truth and Knave always lie. You encounter two people A and B. Determine if possible what A and B are if they address you in the ways described. If you cannot determine what these two people are, can you draw any conclusions? **[Points 25]**

Do a rigorous analysis as we performed in the class by taking care of all the possibilities for both A and B. For each part if you came up with a **correct preposition** you get half the marks. The rest of the marks are for the analysis.

- a) A says “at least one of us is a knave” and B says nothing.
- b) A says “The two of us are both knights” and B says “A is a knave”
- c) A says “I am a knave or B is a knight” and B says nothing
- d) Both A and B says “ I am a knight”
- e) A says “We are both knaves” and B says nothing.

Q:-2 The problems below 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. **[Points 20]**

Do a rigorous analysis as we performed in the class by taking care of all the possibilities for both A and B. For each part if you came up with a **correct preposition** you get half the marks. The rest of the marks are for the analysis.

- a) A says "C is the knave," B says, "A is the knight," and C says "I am the spy."
- b) A says "I am the knight," B says "I am the knave," and C says "B is the knight."
- c) A says "I am the knave," B says "I am the knave," and C says "I am the knave."
- d) A says "I am the knight," B says "A is telling the truth," and C says "I am the spy."

Good Luck