Introduction to Logical Reasoning

Problem Set #1

Although I strongly suggest that you write out answers to all these problems, *you do not have to turn in any written responses*. You do, however, need to be prepared to do these types of problems, for *questions on the weekly quizzes and exams will primarily be drawn from the problem sets*. The solutions to these problems will be provided, so you can check your own work and seek help from me as necessary.

We will devote considerable time to these problems during the next in-class workshop. In order to make that workshop productive, please make a solid start on them. That way we can use the workshop to look at the problems that presented the most difficulties.

If you do the Extra Credit Logic Puzzle, you must turn in your *type-written* solution at the *beginning* (i.e., within the first ten minutes) of class on Sunday, January 16th.

Instructions

Each of the following problems presents a single statement. Indicate whether that statement is simple or compound. If it is simple, indicate whether it is positive or negative. If it is compound, indicate whether is conjunctive, disjunctive, hypothetical, or some combination of these.

Problems

- 1. All the journalists know logic.
- 2. Some marketing executives hate logic.
- 3. Most computer scientists do not hate logic.
- 4. Either the journalists or the computer scientists know logic.
- 5. The journalists know logic and the professor has an easy job.
- 6. Either the professor's wife will not enjoy Qatar or she will have fun.
- 7. The professor's wife certainly does enjoy Qatar.
- 8. The journalists know logic and the computer scientists are jealous.
- 9. If the business students do not love logic, then the professor is sad.
- 10. Either the professor is sad, or if his students are engaged in the class then the professor is happy.
- 11. If the journalists learn logic and the professor has an easy life, then the world is a better place.
- 12. If computer scientists know logic and they get better jobs, then either their lives are easy or they will make lots of money.
- 13. If the journalists like logic then the professor is not sad, and if the professor is not sad then his wife is happy.
- 14. If the journalists either have easy lives or make lots of money, then the computer scientists are jealous.
- 15. If the computer scientists knowing logic would cause the professor to be happy, then the world is a better place for the professor.

Note: There may a lot of exercises here. Do not feel obligated to do all of them. I often assign many exercises so that you have plenty of opportunities to practice the skills these exercises are trying to impart. I suggest doing just enough of them so that you are confident that you could use these skills on a quiz or an exam.

Extra Credit Logic Puzzle (Hard)

One morning, Mr. Rayhan, his wife Mrs. Ayah, their son, and their daughter were having breakfast at a small restaurant. This is a small business with only one employee working at any given time, and this person had stepped out for a smoke. However, a gunshot and a scream were heard, and the employee ran back inside to discover that one member of the family had been murdered. The following statements are known to be true:

- 1. One family member was murdered.
- 2. Another family member committed the murder.
- 3. Yet another family member saw what happened.
- 4. And yet another family member gave the gun to the murderer.
- 5. The person who committed the murder is not the youngest family member.
- 6. The oldest person and the person who saw what happened are of the opposite sex.
- 7. The youngest person and the person murdered are of the opposite sex.
- 8. The person who gave the gun to the murderer is older than the person who was murdered.
- 9. The person who saw what happened and the person who gave the gun to the murderer are of the opposite sex.
- 10. Mr. Rayhan is the oldest family member.

Question: Which family member committed the murder? Which one was murdered? Which one saw what happened? Which one gave the gun to the murderer?

To receive any credit you must justify your answer with a logical argument showing why you are 100% right. That is to say, this question has a definitive answer that can be justified without *any* guessing on your part.