

CS 346U
Exploring Complexity in Science and Technology, Fall, 2009
Week 8 Reading Questions (Chapters 13-14)

Due Wednesday, November 25.

1. In Chapter 13, pp. 187-188, a number of real-world examples of analogies are given. Come up with two real-world analogies of your own (or analogies you overheard or read) that could fit into this list.

2. In class we discussed several common phrases that are “labels for situations”, e.g., “the pot calling the kettle black”, or “out of the frying pan, into the fire”. Think of one additional example like these, and describe two different situations it could be a label for, and how these two situations are “analogous”. Be creative!

E.g., “the pot calling the kettle black” could apply to a situation in which “a professor complains about students who turn in homework late, even though the professor is always late submitting papers or grant proposals” and a situation in which “a wife complains that her husband spent too much money on golf equipment, even though she just spent a lot of money on snowboarding gear.” The two situations are analogous: the professor corresponds to the wife, the students correspond to the husband, handing in homework or papers late corresponds to spending too much money, and both situations have the irony of complaining that someone is doing something that is actually quite similar to what oneself is doing.

3. Come up with five analogy problems similar to those solved by the Copycat program (in the letter-string domain). Give this list to at least three of your friends/relatives to solve. Report on your own answers and any other answers your “subjects” gave. Which do you think are the best answers and why?

4. Explain, in a paragraph or two, the differences among *mathematical models*, *mechanistic models*, and *idea models*, as discussed in Chapter 14.

5. Suppose two players, A and B, play an iterated Prisoner’s Dilemma (that is, play N repeated games against each other), using the payoff matrix given on p. 215 of the textbook.

(a) Suppose player A’s strategy is “always defect” and player B’s strategy is “always defect”. What will each player’s average score be at the end of the N games?

(b) Suppose player A’s strategy is “always cooperate” and player B’s strategy is “always cooperate”. What will each player’s average score be at the end of the N games?

(c) Suppose player A’s strategy is “always defect” and player B’s strategy is “always cooperate”. What will each player’s average score be at the end of the N games?

6. Explain, in your own words (in a paragraph) what the “paradox” of the Prisoner’s Dilemma is, as discussed in Chapter 14, p. 214. Describe a real-life example of this paradox.

7. As described in Chapter 14, Axelrod proposed that the characteristics needed for a successful iterated Prisoner’s Dilemma strategy are to be “nice, retaliatory, forgiving, and clear”. Explain (in one paragraph) why the TIT FOR TAT strategy has these four characteristics.