

CS 2802: Homework 11

April 28, 2019

Handed out April 29, due May 6. This is the last homework :-)

- (Re)read Chapter 3
- Do the following problems:
 - 3.25 (It's enough to say “equivalent” or “not equivalent” here.)
 - 3.26
 - 3.28
 - 3.32 (Provide a careful proof of (e)!)
 - 3.39
 - 3.42(a)
 - 3.44

Additional problem 1: (Adapted from *What is the Name of This Book?*, by Raymond Smullyan.) Suppose that on an island there are three types of people: knights, knaves, and normals. Knights always tell the truth, knaves always lie, and normals sometimes lie and sometimes tell the truth. Detectives questioned three inhabitants of the island—Amy, Brenda, and Claire—as part of the investigation of a crime. The detectives knew that one of the three committed the crime, but not which one. They also knew that the criminal was a knight, and that the other two were not. Additionally, the detectives recorded these statements: Amy: I am innocent. Brenda: What Amy says is true. Claire: Brenda is not a normal. After analyzing their information, the detectives positively identified the guilty party.

- (a) Express all the information above using propositional logic.
- (b) Who is the guilty party? You have to provide an explanation for your conclusion, but you can do the reasoning in English, without writing it down in propositional logic. (You should be able to write it down using propositional logic though!)

Additional problem 2: Using the definitions of problem 12.10, show that every two-ended simple connected graph is a line graph.

Think about (but don't hand in) 3.3, 3.23