Probabilistic Reasoning Excercises

15.13

* A professor wants to know if students are getting enough sleep. Each day, the professor observes whether the students sleep on class, and whether they have red eyes. The professor has the following domain theory:
  + The Prior probability of getting enough sleep with no observations is .7
  + The probability of getting enough sleep on night *t* is 0.8 given that the student got enough sleep the previous night, and 0.3 if not
  + The probability of having red Eyes is 0.2 if the student got enough sleep, and 0.7 if not
  + The probability of sleeping in class is 0.1 if the student got enough sleep and 0.3 if not

Formulate this information as a dynamic Bayesian network that the professor could use to filter or predict from a sequence of observations. Then reformulate it as a hidden Markov model that has only a single observation variable. Give the complete probability tables for the model

