

Tutorial

Bayesian Networks

October 22, 2007

Solutions should be given till October 29, 2007, 8:00 am

1. Suppose, the following rules are given (6 points):

(1) I take a cup of coffee *implies* I will stay awake during lecture with certainty 0.5

(2) I take a walk *implies* I will stay awake during lecture with certainty 0.8

Question:

What is the minimal and maximal possible certainty of the combined rule “I take a cup of coffee *and* I talk a walk *implies* I will stay awake during lecture”? Explain your answer in details please!

2. Suppose, the following rules are given (6 points):

(1) I take a cup of coffee *implies* I will stay awake during lecture with certainty 0.5

(2) I stay awake during lecture *implies* I will get good marks in the exam with certainty 0.8

Question:

What is the minimal and maximal possible certainty of the chained rule “I take a cup of coffee *implies* I will get good marks in the exam”? Explain your answer in details please!

3. Suppose, the following rule is given (6 points):

I take a cup of coffee *implies* I will stay awake during lecture with certainty 0.5

Question:

What is the minimal and maximal possible certainty of the abducted rule “I do not stay awake during lecture *implies* I did not take a cup of coffee”? Explain your answers in details please!

4. The Bayesian Network in the following Figure is given. Suppose we observe $A=0, E=0, F=0$. We are interested in the value of D. Which setting of D is the most probable? (7 points)

