

CS4600 - Introduction to Intelligent Systems

Fall 2003

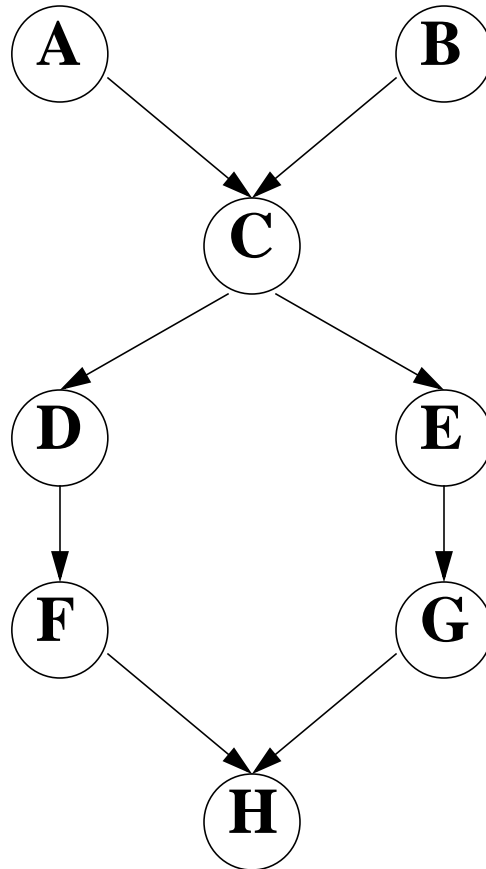
Homework 7 - Probabilities and Bayes Nets

Problem 1

Of the entire population, 2% has a certain disease X. A test Y, which indicates whether or not a person has the disease, is not 100% accurate. If a person has the disease, there is a 6% chance that it will go undetected by the test. However, there is also a 9% chance of "false alarm" (meaning that the person does not have the disease but the test indicates otherwise). A person Z takes a test which later comes out positive (meaning that the test says he has the disease). What is the probability of this person having the disease in reality?

Problem 2

Consider the following Bayesian network:



- Are D and E necessarily independent given evidence about both A and B?
- Are A and C necessarily independent given evidence about D?
- Are A and H necessarily independent given evidence about C?

Problem 3

Consider the following Bayesian network. A, B, C, and D each could have a value of either true or false. If we know that A is true, what is the probability of D being true?

