Intelligent Systems: Reasoning and Recognition

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MOSIG M1 Winter Semester 2018

Exercise 9 13 April 2018

Bayesian Networks

1) Two random variables are Independent if $P(A,B) = P(A) \cdot P(B)$. Demonstrate that

a) $A \perp B \mid C \Leftrightarrow P(A \mid B, C) = P(A \mid C)$

b) $A \perp B \mid C \Leftrightarrow P(A, B \mid C) = P(A \mid C) \cdot P(B \mid C)$

2) Air France has labor troubles and the staff goes on strike two out of six days. Whenever there is a strike, Air France cancels 20% of its flights.
Air Traffic Control is protesting new labor rules and goes on strike 1 out of every 10 days. Whenever Air Traffic Control goes on strike, 80% of all flights are canceled.

Assume that you purchase a ticket from Paris to New York on Air France. Construct a Bayesian network that allows you to determine the probability that you will be able to travel to New York on the day of your ticket.