Advanced AI Techniques (WS04)

Excercise sheet 1

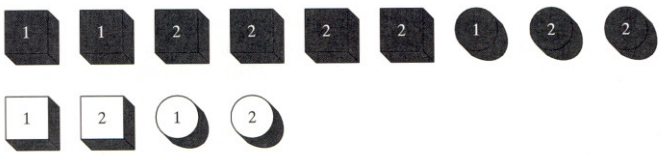
Deadline: 28.10.04

Excercise 1 *Consider the following JPD over the three binary variables A, B, and C:*

C	*B*	*A*	*probability*
0	*0*	*0*	*1/4*
0	*0*	*1*	*1/12*
0	*1*	*0*	*1/8*
0	*1*	*1*	*1/24*
1	*0*	*0*	*1/24*
1	*0*	*1*	*1/8*
1	*1*	*0*	*1/12*
1	*1*	*1*	*1/4*

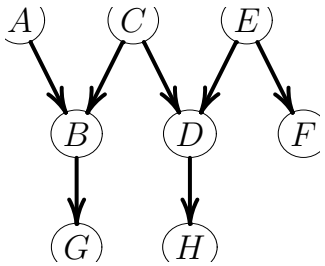
1. *Are A and B independent?*
2. *Are A and B conditionally independent?*

Excercise 2 *Let p be the joint probability distribution of the variables color, shape, and label of an object drawn with replacement from the following population:*



1. *Compute a markov network that represents p as accurately as possible.*

Excercise 3 *Determine which variables are d-separated from A by G in the following graph:*



Additionally, use u-separation in the moral graph to give reasons for E being d-separated from A by G or not.