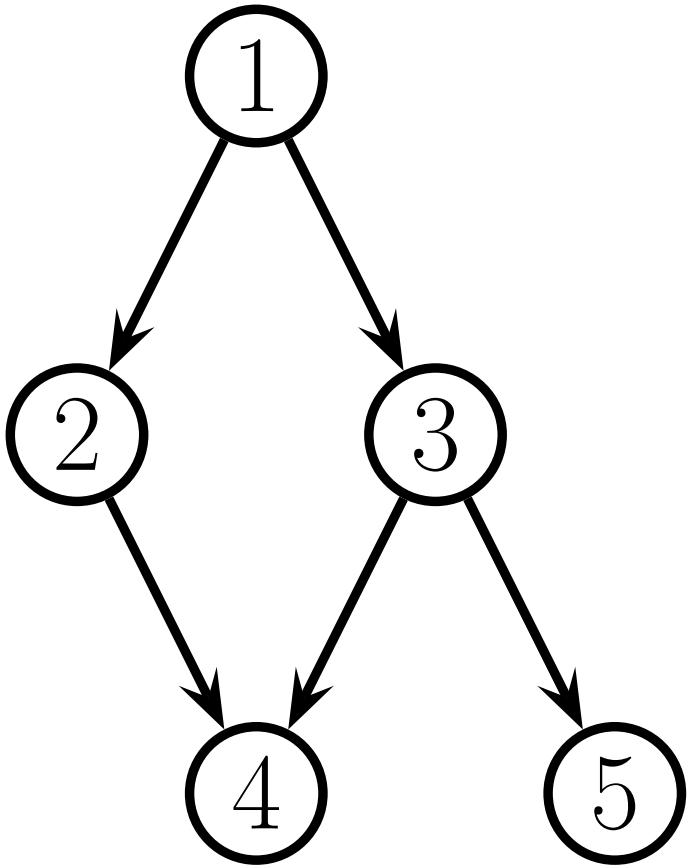
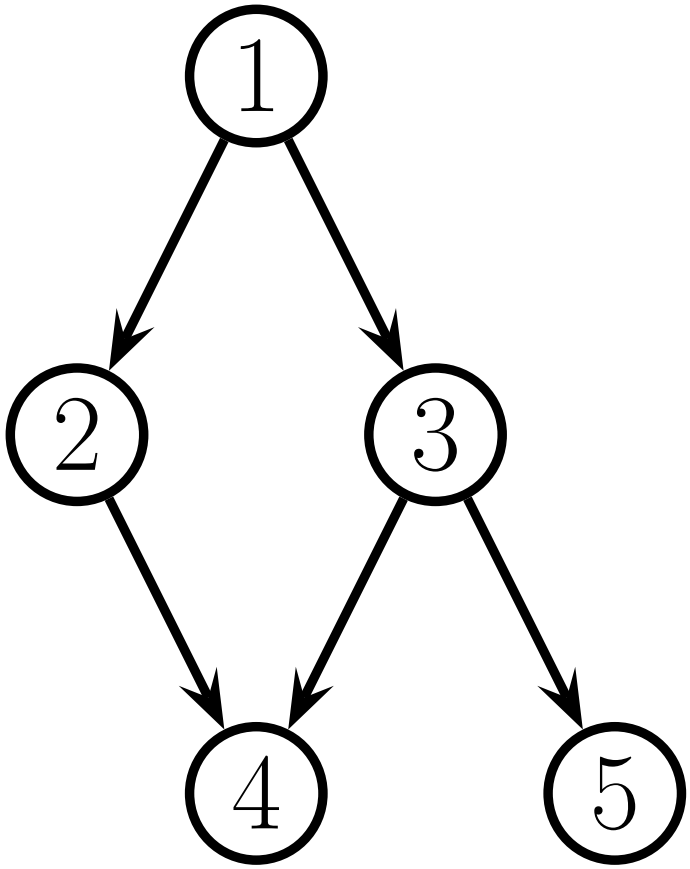
Royal Institute of Technology

DGM TERMINOLOGY EXAMPLE



TERMINOLOGY

- ★ Parent
- ★ Child
- ★ Family
- ★ Root
- ★ Leaf
- ★Neighbors



TERMINOLOGY

- ★ Degree (in and out)
- ★ Path (directed or not)
- ★ Cycle (directed or not)
- ★ Directed Acyclic Graph (DAG)
- ★ Topological order (parents < child)
- ★Ancestors

CPD - BERNOULLI OR CATEGORICAL

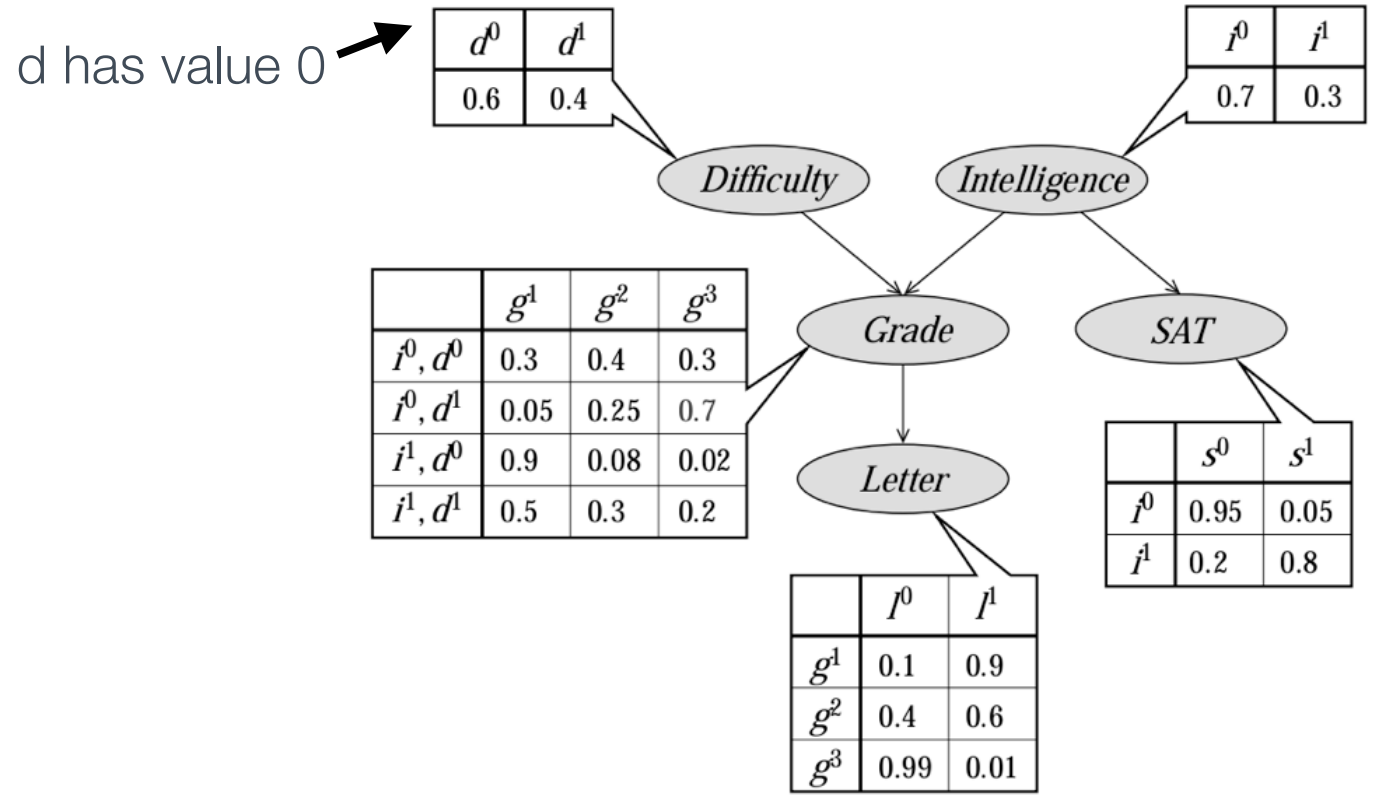
$$\mathrm{Ber}(x|\theta) = \begin{cases} \theta & \text{if } x = 1 \\ 1-\theta & \text{if } x = 0 \end{cases}$$

$$\mathrm{Cat}(x|\boldsymbol{\theta}) = \theta_x$$

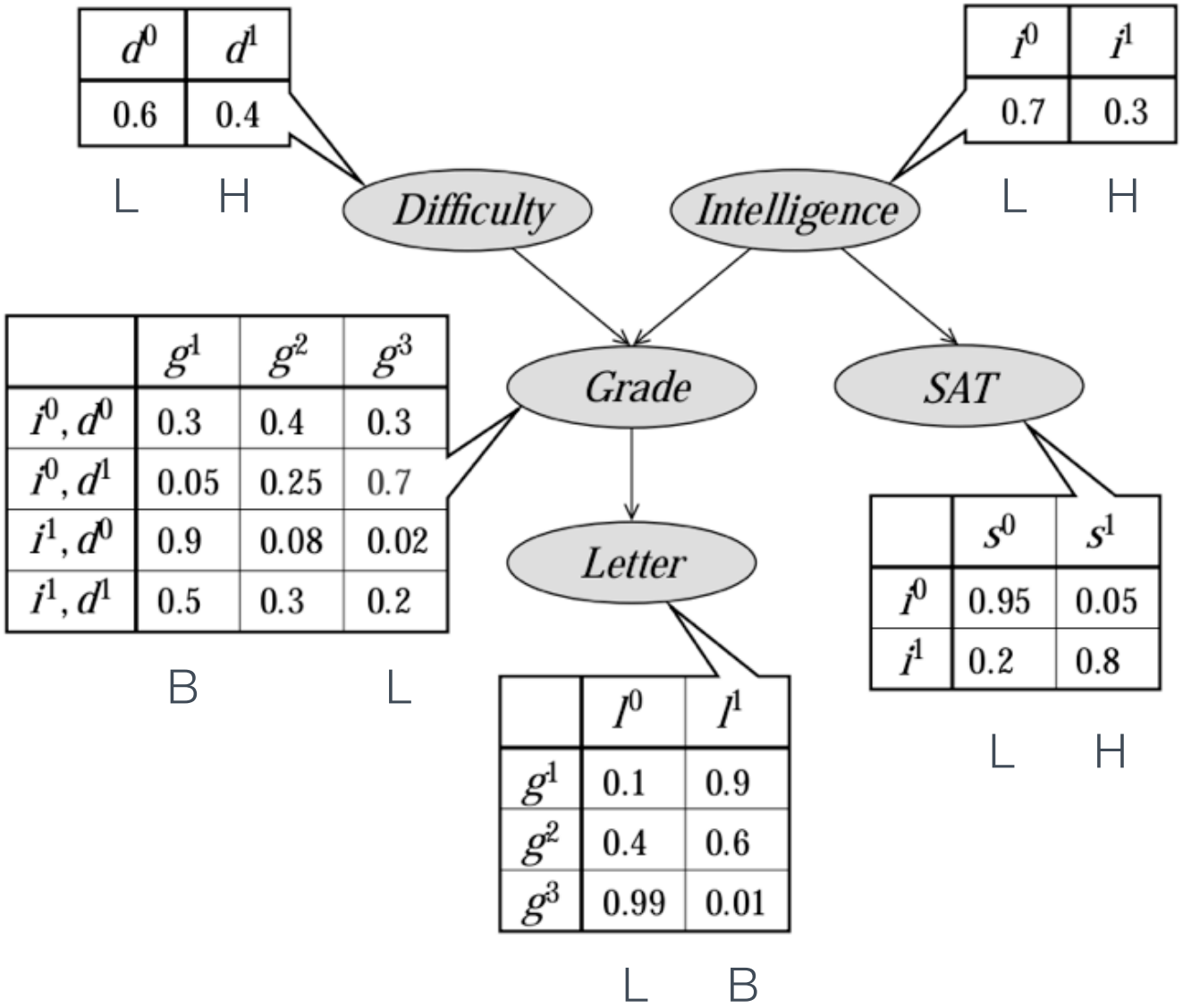
- One or several (unordered) coin tosses
- A dice (usually biased)

NOTATION

d has value 0



STUDENT EXAMPLE

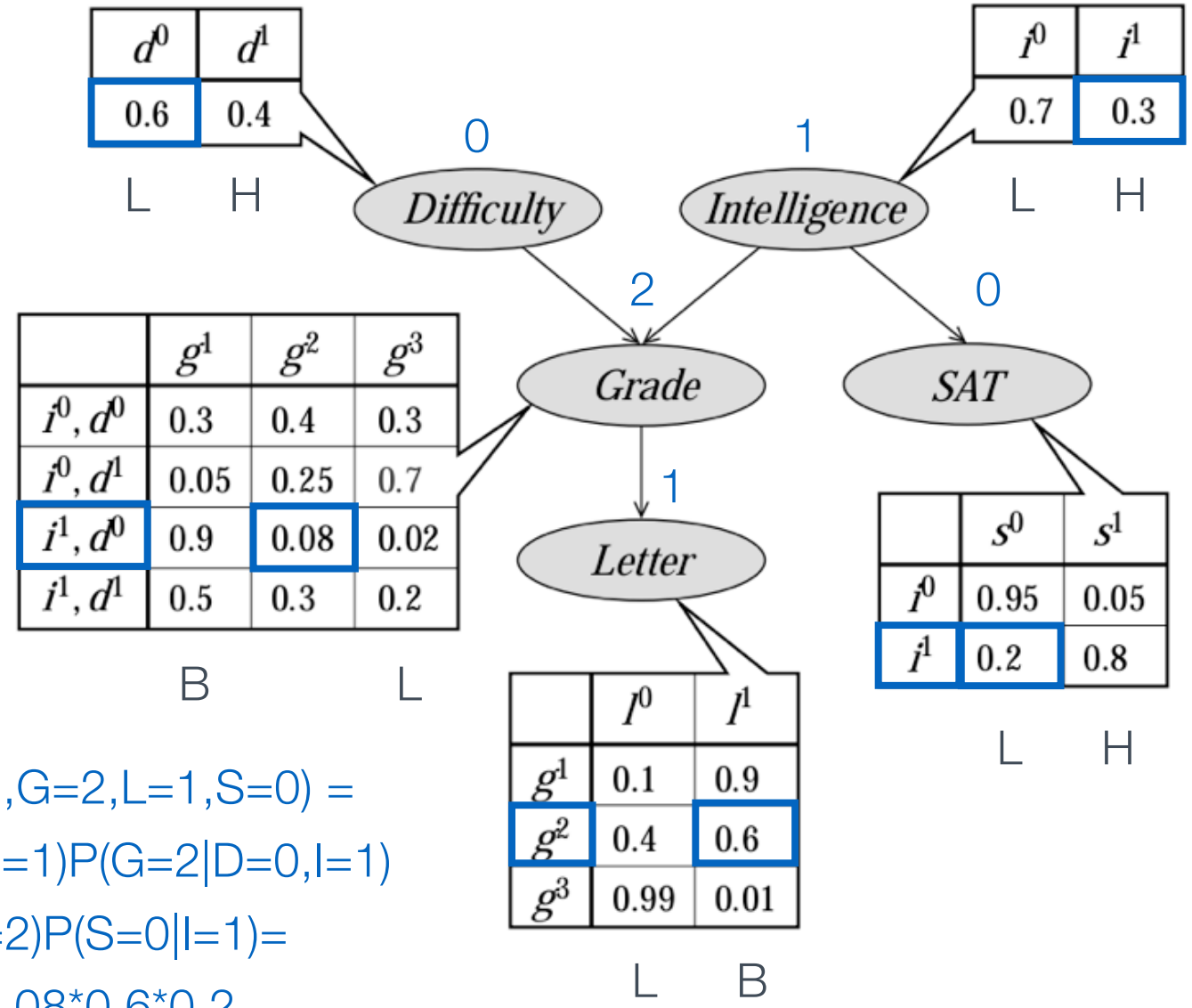


B - better

H - higher

L - less

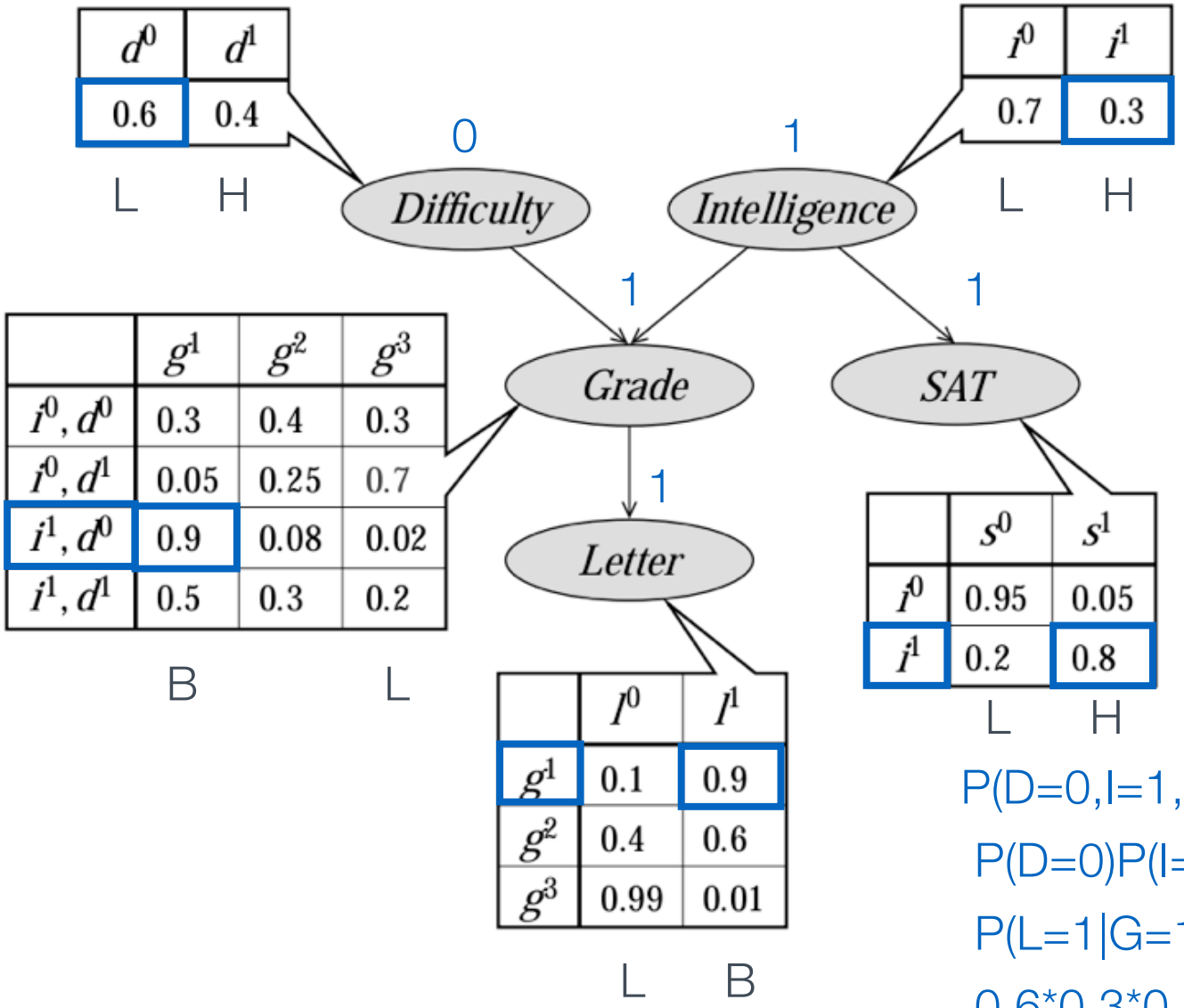
STUDENT EXAMPLE



P(D=0,I=1,G=2,L=1,S=0) =
P(D=0)P(I=1)P(G=2|D=0,I=1)
P(L=1|G=2)P(S=0|I=1)=
0.6*0.3*0.08*0.6*0.2

B - better
H - higher
L - less

STUDENT EXAMPLE



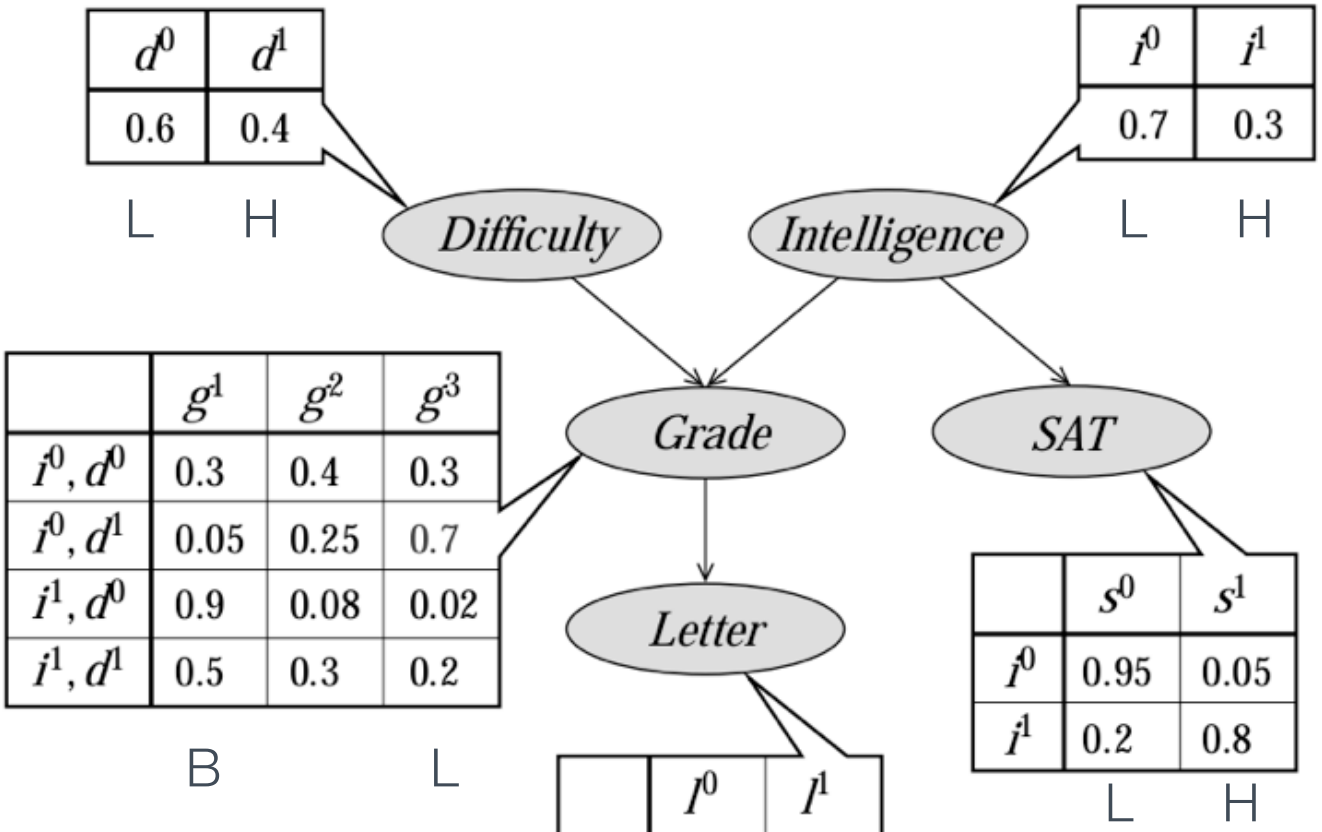
P(D=0,I=1,G=1,L=1,S=1) =

P(D=0)P(I=1)P(G=1|D=0,I=1)

P(L=1|G=1)P(S=1|I=1)=

0.6*0.3*0.9*0.9*0.8

STUDENT EXAMPLE



P(D=0,I=1,G=2,L=1,S=0) =
P(D=0)P(I=1)P(G=2|D=0,I=1)
P(L=1|G=2)P(S=0|I=1)=
0.6*0.3*0.08*0.6*0.2

P(D=0,I=1,G=1,L=1,S=1) =
P(D=0)P(I=1)P(G=1|D=0,I=1)
P(L=1|G=1)P(S=1|I=1)=
0.6*0.3*0.9*0.9*0.8