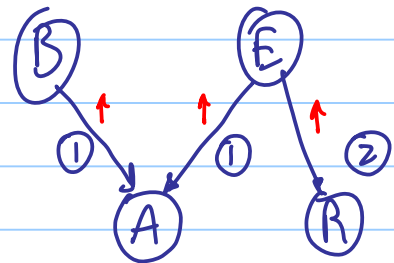


582 2016-01-16

Note Title

2016-01-14

Earthquake or burglary



- ① evidential reasoning
- ② intercausal reasoning (explaining away)

From these examples, we can distinguish different types of transmission of evidence;

1. Serial (or pipelined) influence



a change in the certainty of A
may affect the certainty of C

- || B is not known, influence may pass from A to C.
- || B is known, influence may not pass from A to C.

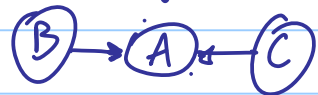
2. Diverging influence



If A is not known, B may influence C.

If A is known, B may not influence C.

3. Converging influence



If A is not known, B may not influence C.

If A is known, B may influence C.

directional [Pearl]



Definition 2.1 [JO7] (d-separation)

Two distinct variables A and B in a causal network are d-separated if for all paths between A and B there is an intermediate variable V

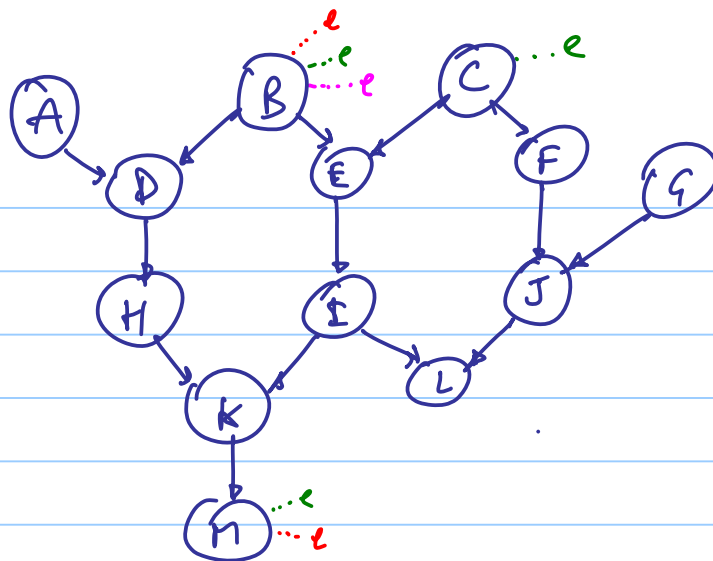
[Note; therefore two adjacent variables cannot be d-separated, such that either

- the connection at V is serial or diverging and V is instantiated ("is known"), or

- the connection is converging and neither V nor any of V 's descendants is instantiated (is "known").

If A and B are not d -separated, they are (said to be) d -connected.

Claim (p. 30 [507]) If A and B are d -separated, then changes in the certainty of A have no effect on changes in the certainty of B .



Is A d-separated from J given evidence on B and M?
(no)

Defn 2.2 [J07]. The Markov blanket of a variable A is the set consisting of the parents of A , the children of A , and the variables that share a child (the spouses) of A .

Claim (Ex. 2.8 [J07]). Let A be a variable in a causal network. Assume that all variables in A 's Markov blanket are instantiated. Then

A is d-separated from the remaining unobserved variables.