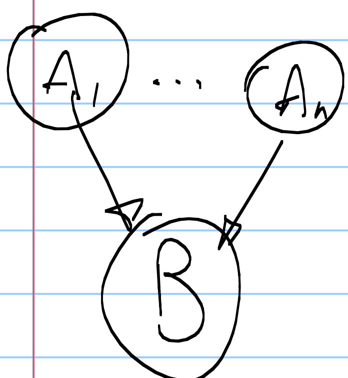
2010-09-24

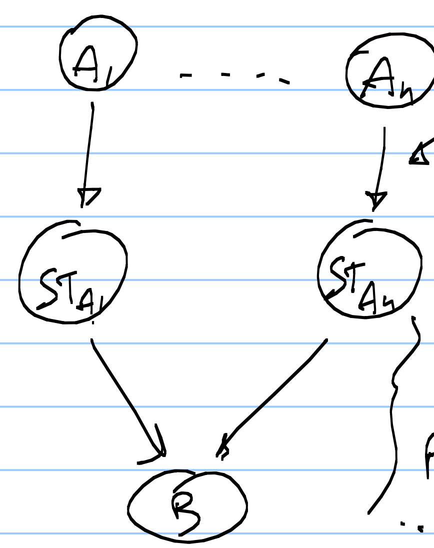
Note Title 9/22/2010



assume independence of causal influence

Noisy OR justified

$\Rightarrow$



The original $P(B|A_i)$ $1-q_i$

(logical) OR

$P(B|\cdots)=0$ iff … are all no

D-seperation implies independence:

if A and B are d-separated, then
A and B are independent

<u>But</u>, independence does not imply d-separation:
A and B may be independent even if they
are d-connected.

Example

$A \rightarrow B$.

$A = (0.5, 0.5)$

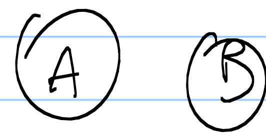
B \ A	y	n
y	0.5	0.5
n	0.5	0.5

$\Rightarrow P(A,B) =$

B \ A	y	n
y	.25	.25
n	.25	.25

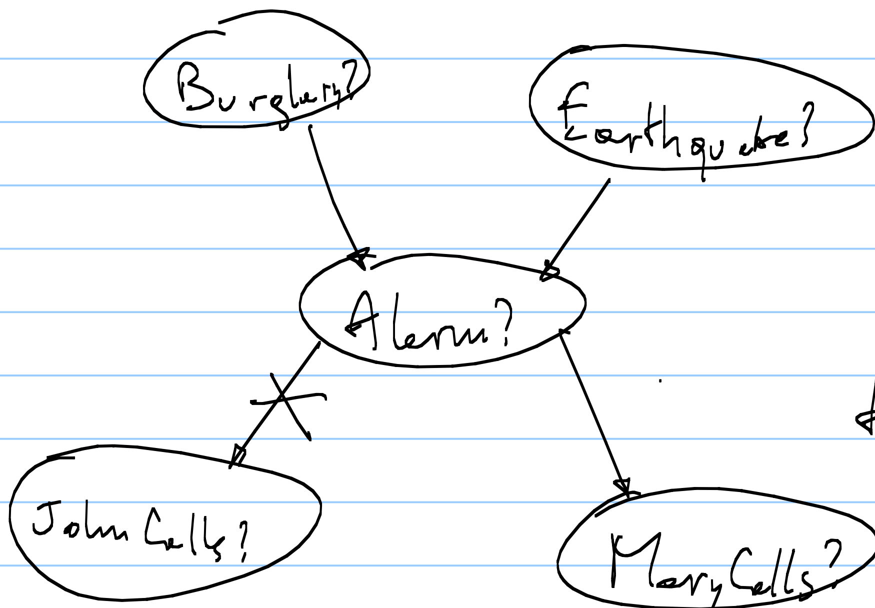
Clearly, $P(A,B) = P(A)\,P(B)$, i.e., A and B are independent. <u>But</u>, A and B are not d-separated.

This same joint probability could be represented by this BN.



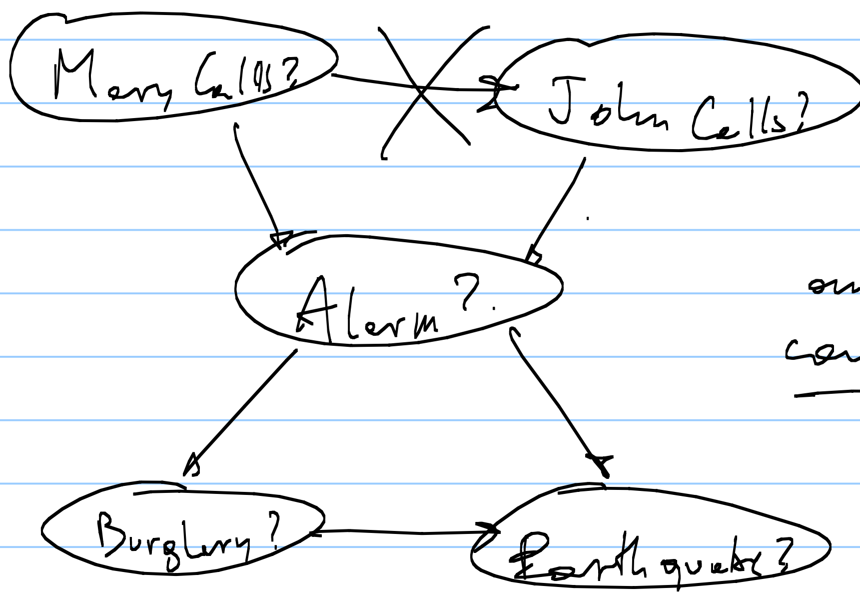
$P(A) = (0.5, 0.5)$

$P(B) = (0.5, 0.5)$



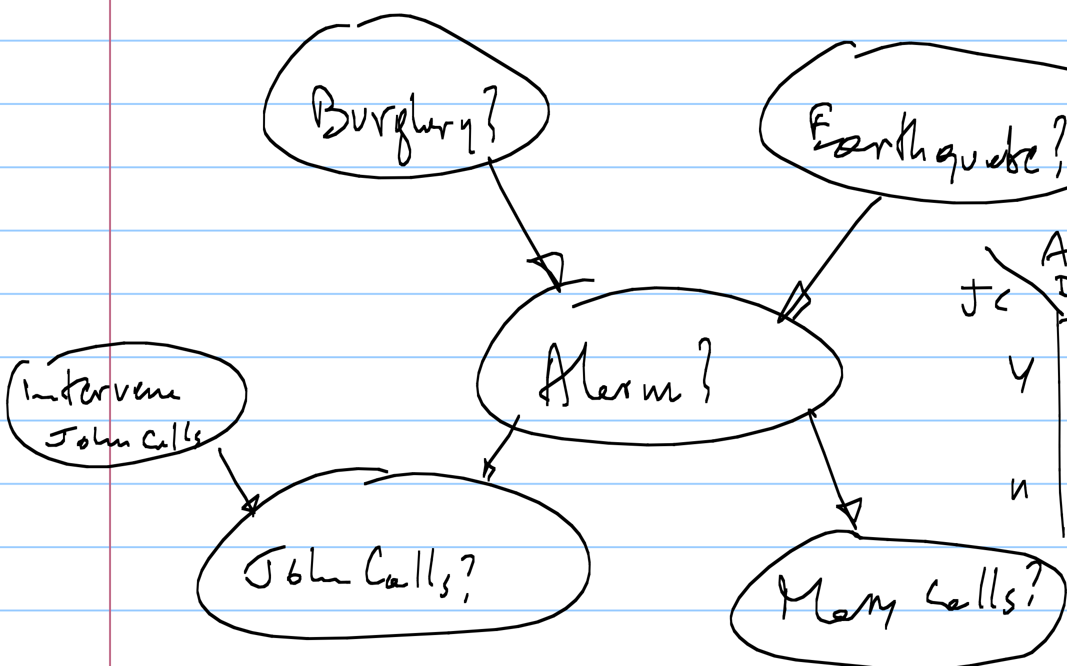
Intervention on a variable corresponds to creating a new DAG in which the edges into the variable are removed.

(The excision semantics for BNs)

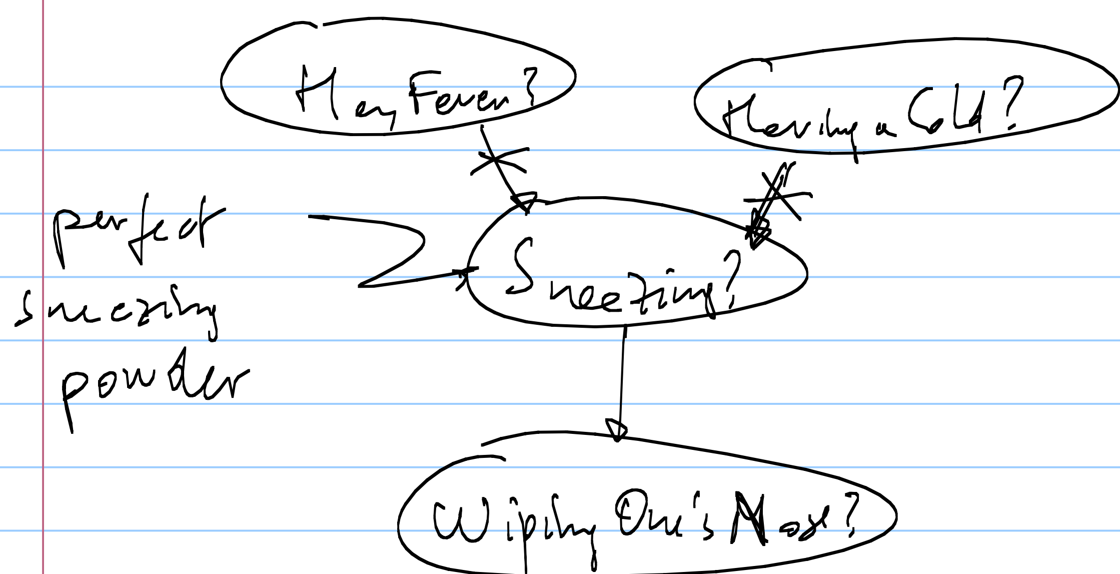


The excision semantics only works on causal Bayesian networks.

The 'strength' of the intervention is P(InterveneJohnCalls)



JC \ A	y	n	y	n
IJC	y		n	
y	1	1	0.9	0.05
n	0	0	0.1	0.95


Hay Fever?
Having a Cold?
perfect sneezing powder
Sneezing?
Wiping One's Nose?