

The example refers to the Bayesian network on the right.

The goal is to compute:
 $P(B = \text{true} \mid J = \text{true}, M = \text{true})$ and
 $P(B = \text{false} \mid J = \text{true}, M = \text{true})$

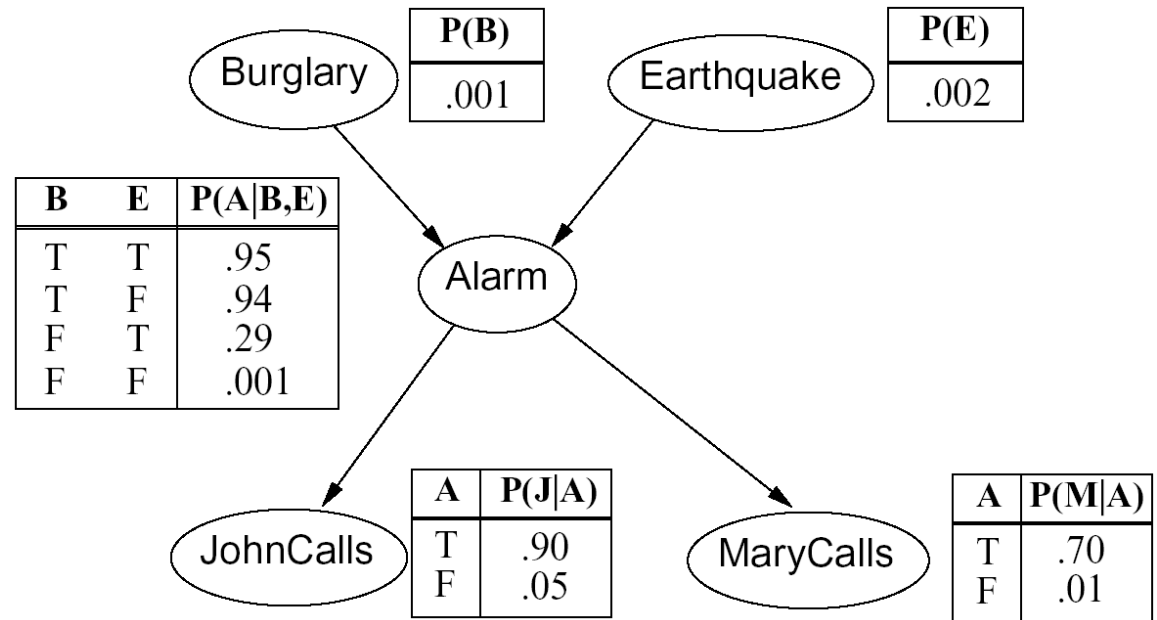
The last page does the computation in the wrong order, but it happens to have the right result in the end. The three factors with an A column should have been multiplied first, to derive the factor:

B	A	
T	T	$(.9)(.7)v_1$
T	F	$(.5)(.1)v_2$
F	T	$(.9)(.7)v_3$
F	F	$(.5)(.1)v_4$

Summing out A results in:

B	
T	$(.9)(.7)v_1 + (.5)(.1)v_2$
F	$(.9)(.7)v_3 + (.5)(.1)v_4$

Multiplying this factor times the other B factor yields the result in the bottom right of the last page.



B	
T	.001
F	.999

E	
T	.002
F	.998

B	E	A	
T	T	T	.95
T	T	F	.05
T	F	T	.94
T	F	F	.06
F	T	T	.29
F	T	F	.71
F	F	T	.001
F	F	F	.999

A	J	
T	T	.9
T	F	.1
F	T	.05
F	F	.95

A	M	
T	T	.7
T	F	.3
F	T	.01
F	F	.99

$$P(B=T | J=T, M=T)$$

$$P(B=F | J=T, M=T)$$

E	
T	.002
F	.998

	B	E	A		B	E	A	
X	T	T	T	.95	T	T	T	.002(.95)
	T	T	F	.05	T	T	F	.002(.05)
	T	F	T	.94	T	F	T	.998(.94)
	T	F	F	.06	T	F	F	.998(.06)
	F	T	T	.29	F	T	T	.002(.29)
	F	T	F	.71	F	T	F	.002(.71)
	F	F	T	.001	F	F	T	.998(.001)
	F	F	F	.999	F	F	F	.998(.999)

sum out E

	B	A		
T	T		.002(.95) + (.998)(.94)	V_1
T	F		2nd row + 4th row	V_2
F	T		5th row + 7th row	V_3
F	F		6th row + 8th row	V_4

B	
T	.011
F	.989

A	
T	.9
F	.05

A	
T	.7
F	.01

B	A	
T	T	v_1
T	F	v_2
F	T	v_3
F	F	v_4

=

B	A					
T	T	.001	(.9)	(.7)	v_1	= x_1
T	F	.001	(.05)	(.01)	v_2	= x_2
F	T	.989	(.9)	(.7)	v_3	= x_3
F	F	.999	(.05)	(.01)	v_4	= x_4

$$\frac{x_1 + x_2}{x_1 + x_2 + x_3 + x_4}$$

$$P(\bar{B} = T | J = T, M = T)$$

B	
T	$x_1 + x_2$
F	$x_3 + x_4$