

## Direct numeric analysis of Markov chain simulation

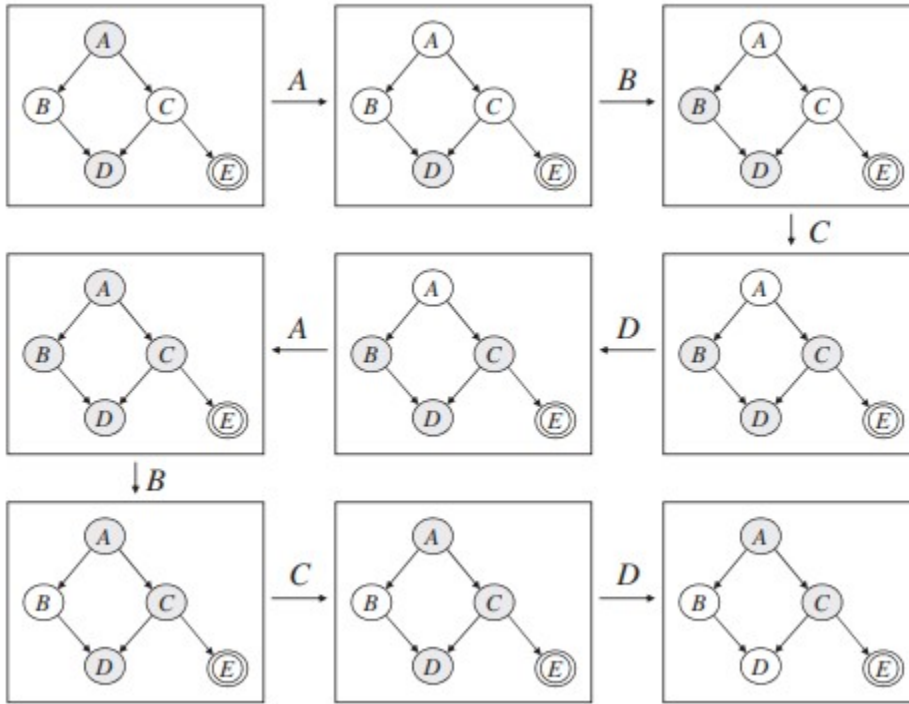
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From: Darwiche, A. (2009). Modeling and reasoning with Bayesian networks.  
 epdf.pub\_modeling-and-reasoning-with-bayesian-networks.pdf darwiche@cs.ucla.edu

### 15.7 Markov chain simulation

Figure 15.13: Simulating a Gibbs chain, text page 406

(15.13.1)



LET  $p, q, r, s, t:$   
 $A, B, C, D, E.$

$$p > ((q > s) + (r > (s + t))) ; \quad \begin{matrix} TTTT & TTT\mathbf{F} & TTTT & TTTT \end{matrix} \} 64 \\ \begin{matrix} TTTT & TTTT & TTTT & TTTT \end{matrix} \} \quad (15.13.2)$$

**Remark 15.13.2:** Eq. 15.13.2 as rendered is *not* tautologous. Note that the result consists of 128 16-valued truth tables presented horizontally, row-major, to save space. Hence there are a total number of 2048 logical values above for 64 **F** and 1984 **T**.

An approach to map Fig. 15.13 into respective probabilities is arbitrarily assigning the **FCNT** logic values as based on a scale of 4, presuming contradiction and tautology are respectively the least and most desirable statistical states.

4-valued logic:	<b>F</b> {00} contradiction	<b>C</b> {10} falsity	<b>N</b> {01} truthity	<b>T</b> {11} tautology
Probability:	1/4	2/4	3/4	4/4