

Readings:
K&F: 3.1, 3.2, 3.3.1, 3.3.2

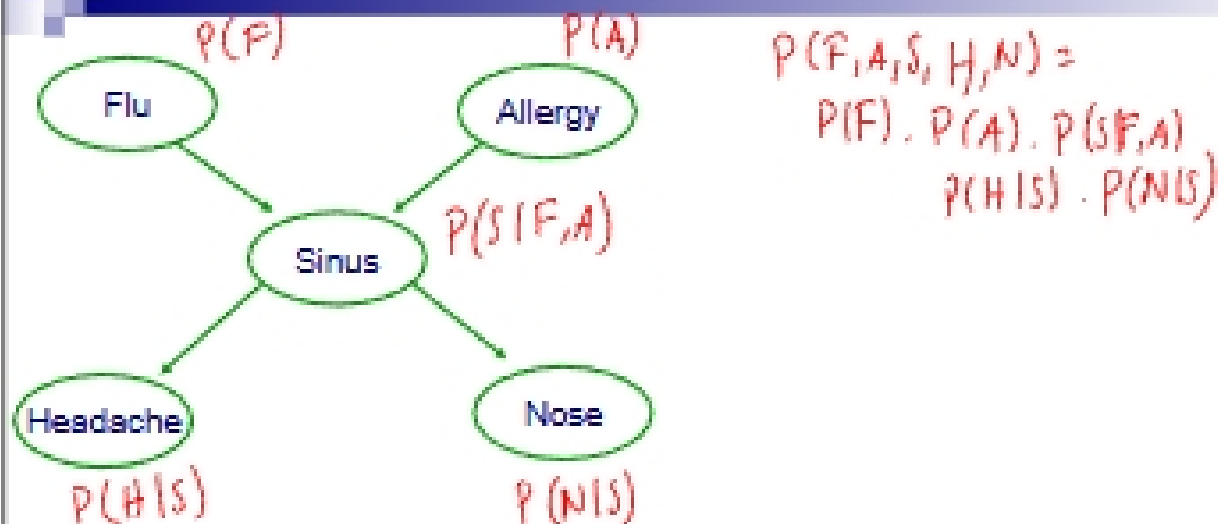
BN Semantics 2 – Representation Theorem The revenge of d-separation

Graphical Models – 10708
Carlos Guestrin
Carnegie Mellon University
September 17th, 2008

10-708 – ©Carlos Guestrin 2008-2009

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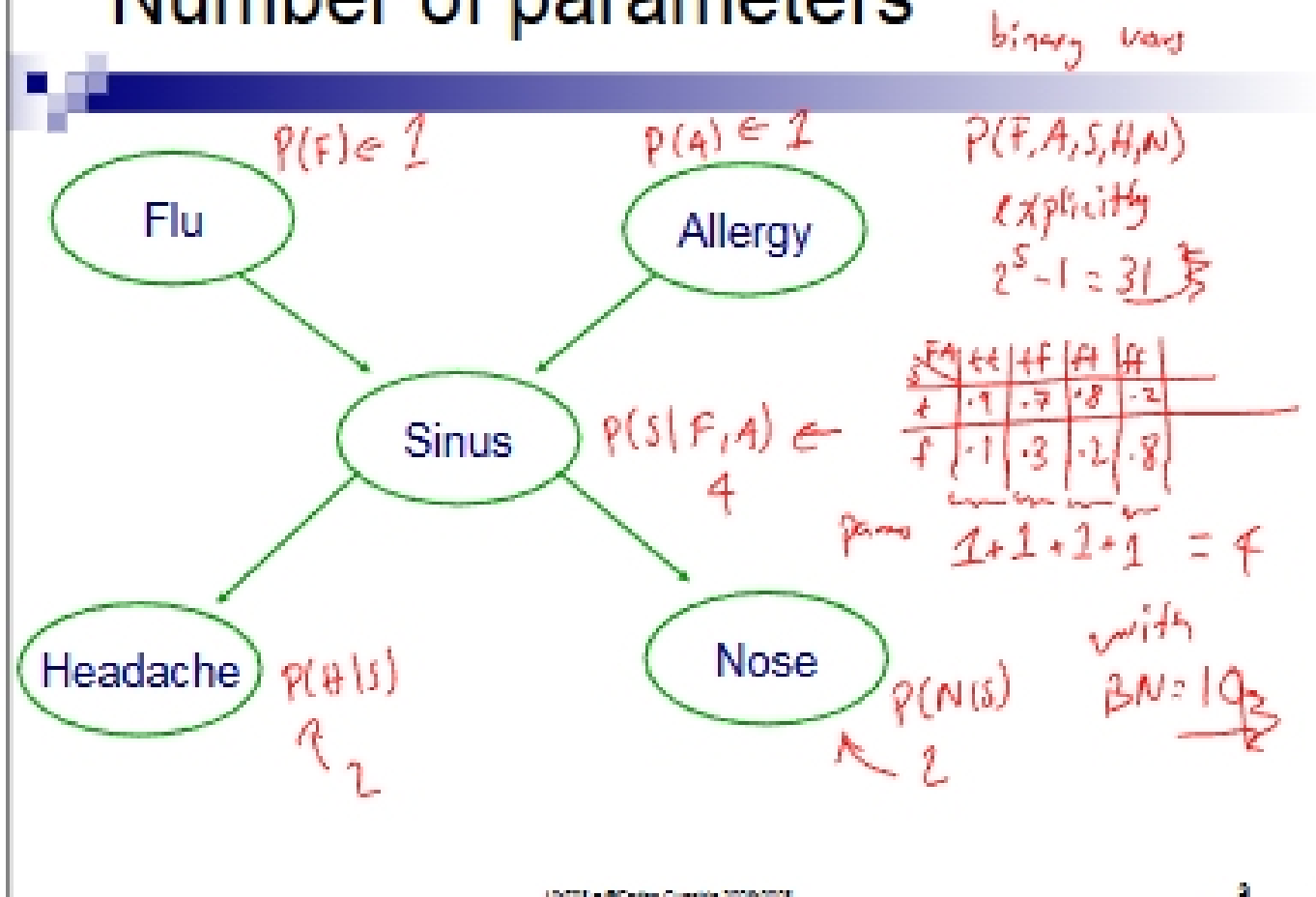
Factored joint distribution - Preview



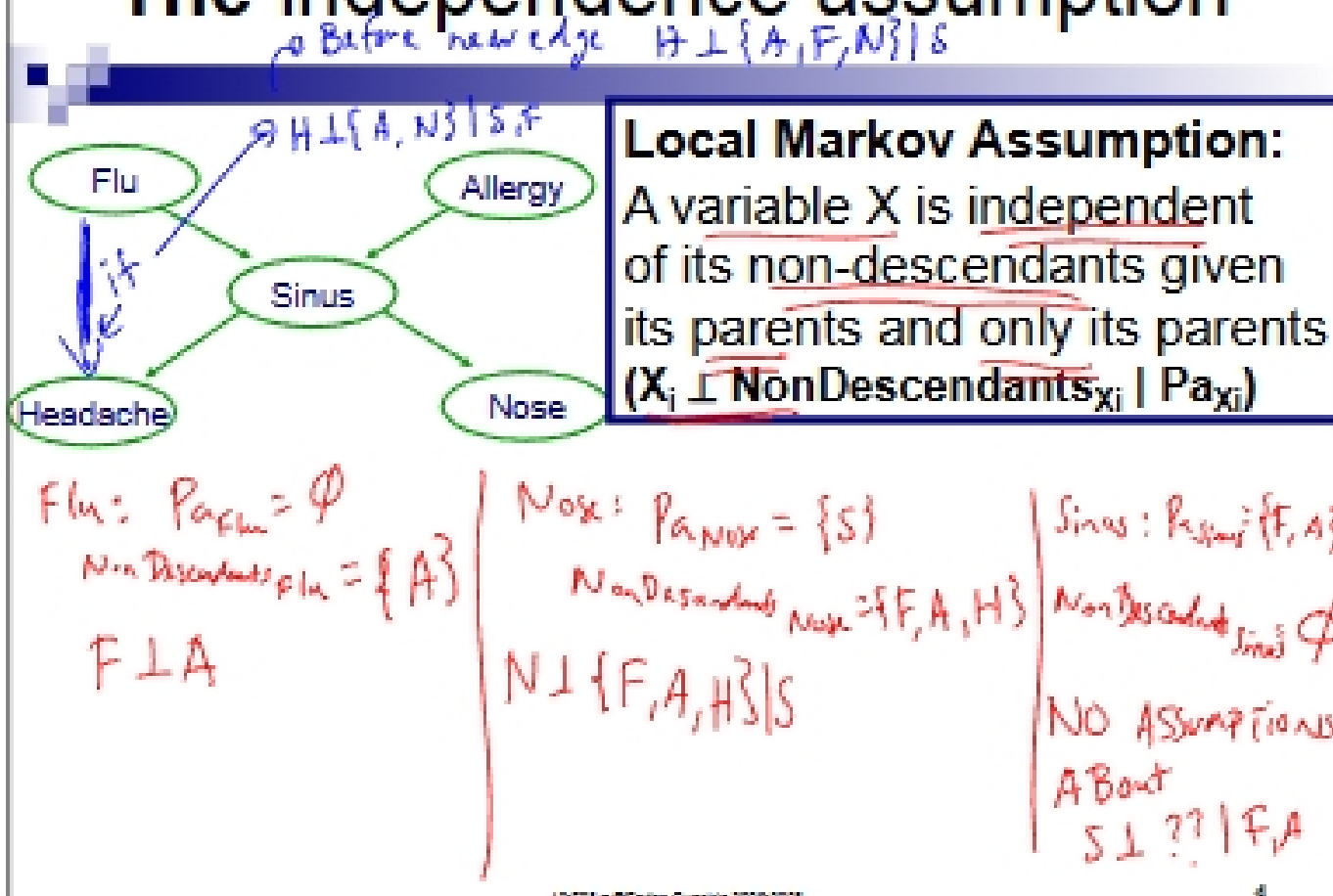
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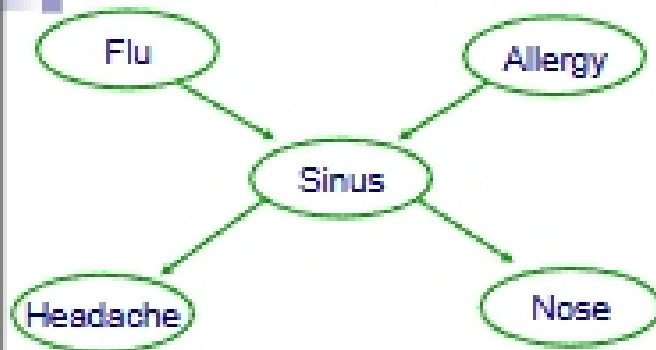
Number of parameters



The independence assumption



Joint distribution



Why can we decompose? Local Markov Assumption!

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A general Bayes net

- Set of random variables
- Directed acyclic graph

- CPTs

- Joint distribution:

$$P(X_1, \dots, X_n) = \prod_{i=1}^n P(X_i \mid \mathbf{Pa}_{X_i})$$

- **Local Markov Assumption:**

- A variable X is independent of its non-descendants given its parents and only its parents – $(X_i \perp \text{NonDescendants}_{X_i} \mid \text{Pa}_{X_i})$

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