

Bayesian Networks and Influence Diagrams: A Guide  
to Construction and Analysis  
Answers to Chapter 7

Uffe B. Kjærulff and Anders L. Madsen  
Answers to Exercises

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**Answer to Exercise 7.1:**

- (a) See file with HUGIN model.
- (b)  $P(\text{SoreThroat}) = 0.4776$ .
- (c) See file with HUGIN model.

**Answer to Exercise 7.2:**

- (a) Each expert node is eliminated by a single marginalization. For instance,  $\sum_{\text{Experts}_1} P(\text{Experts}_1)P(\text{Cancer}|\text{Smoker}, \text{Experts}_1)$ .
- (b) See file with HUGIN model.

**Answer to Exercise 7.3:** See file with HUGIN model where the conditional probability distributions for Shape and Color given Class are unknown.

**Answer to Exercise 7.4:**

- (a) The result depends on the order in which arcs are reversed. See file with HUGIN model for order (Tub\_or\_cancer, X\_ray) and (Tub\_or\_cancer, Dysponea).
- (b) See file with HUGIN model.

**Answer to Exercise 7.5:**

- (a) See file with HUGIN model.
- (b)  $\text{MEU}(\Delta) = 2.993$ .
- (c)  $\text{MEU}(\Delta|BT) = 5.448$ .
- (d) See file with HUGIN model.