

function ENUMERATION-ASK(X, \mathbf{e}, bn) **returns** a distribution over X

inputs: X , the query variable

\mathbf{e} , observed values for variables \mathbf{E}

bn , a Bayes net with variables $vars$

$\mathbf{Q}(X) \leftarrow$ a distribution over X , initially empty

for each value x_i of X **do**

$\mathbf{Q}(x_i) \leftarrow$ ENUMERATE-ALL($vars, \mathbf{e}_{x_i}$)

where \mathbf{e}_{x_i} is \mathbf{e} extended with $X = x_i$

return NORMALIZE($\mathbf{Q}(X)$)

function ENUMERATE-ALL($vars, \mathbf{e}$) **returns** a real number

if EMPTY?($vars$) **then return** 1.0

$V \leftarrow$ FIRST($vars$)

if V is an evidence variable with value v in \mathbf{e}

then return $P(v | \text{parents}(V)) \times \text{ENUMERATE-ALL}(\text{REST}(vars), \mathbf{e})$

else return $\sum_v P(v | \text{parents}(V)) \times \text{ENUMERATE-ALL}(\text{REST}(vars), \mathbf{e}_v)$

where \mathbf{e}_v is \mathbf{e} extended with $V = v$