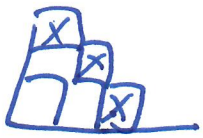
Explaining away

$P(\neg e \mid \neg b, \neg m) = \alpha \sum_G P(\neg m, \neg e, \neg b, G)$

↓ compared to $P(\neg e)$

- same //
- more /
- less /
- idk



$= \alpha \sum_G P(\neg m \mid \neg b, \neg e) P(G \mid \neg b) P(\neg b) P(\neg e)$

$= \alpha P(\neg m \mid \neg b, \neg e) P(\neg b) P(\neg e) \underbrace{\sum_G P(G \mid \neg b)}_{1}$

$P(\neg m \mid \neg b, \neg e) P(\neg b) P(\neg e)$
$1 \qquad 0.05 \qquad 0.3$

$P(\neg m \mid \neg b, e) P(\neg b) P(e)$
$1 \qquad 0.05 \qquad 0.7$

$\alpha \langle 0.3, 0.7 \rangle$
$\neg e$

The probabilities we calculated

- $P(m \mid e) = 0.855$ causal inference (top-down)

  prior $P(m) = 0.60$ calculated with enumeration

- $P(\neg e \mid \neg m) = 0.7379$ diagnostic inference (bottom-up)

  $prior(\neg e) = 0.3$ root node

- $P(\neg e \mid \neg b, \neg m) = 0.3$ explaining away

  $prior\ is\ (\neg e) = 0.3$

[t t t t]
[t f t t]
[t f t f]

draw from a 0.1, 0.9 distribution

[ ]