

2025 april 2

Wednesday, April 2, 2025

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$$P(G=T) = \frac{4}{5}$$

$$P(X=T) = \frac{3}{4}$$

$$P(M = G \vee X) = \frac{2}{3}$$

Before Intervention

$$P(G=T | M=T) = \frac{P(G=T, M=T)}{P(M=T)}$$

$$= \frac{P(TTT) + P(TFT)}{P(TTT) + P(TFT) + P(FTT) + P(FTT)}$$

$$= \frac{\left(\frac{4}{5}\right)\left(\frac{3}{4}\right)\left(\frac{2}{3}\right) + \left(\frac{4}{5}\right)\left(\frac{1}{4}\right)\left(\frac{2}{3}\right)}{\left(\frac{4}{5}\right)\left(\frac{3}{4}\right)\left(\frac{2}{3}\right) + \left(\frac{4}{5}\right)\left(\frac{1}{4}\right)\left(\frac{2}{3}\right) + \left(\frac{1}{5}\right)\left(\frac{3}{4}\right)\left(\frac{2}{3}\right) + \left(\frac{1}{5}\right)\left(\frac{1}{4}\right)\left(\frac{2}{3}\right)}$$

$$= \frac{24 + 8}{24 + 8 + 6 + 1} = \frac{32}{39}$$

After Intervention $X=T \Rightarrow G, M$
independent