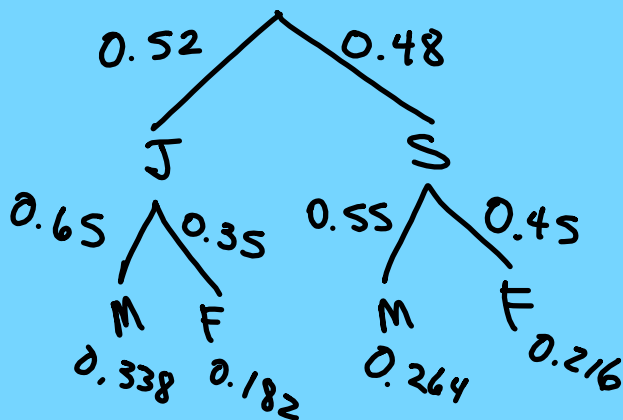


CONDITIONAL PROBABILITY ^{have a known fact}

52% of upperclassmen are juniors.
 Of those juniors, 65% are male.
 45% of seniors are female.

- 1) Conditional Prob.
- 2) Expected Value



$$P(SF) = 0.216$$

$$P(M) = JM \text{ or } SM \\ 0.338 + 0.264 \\ = 0.602$$

If a male is selected, what is the prob he is a junior?

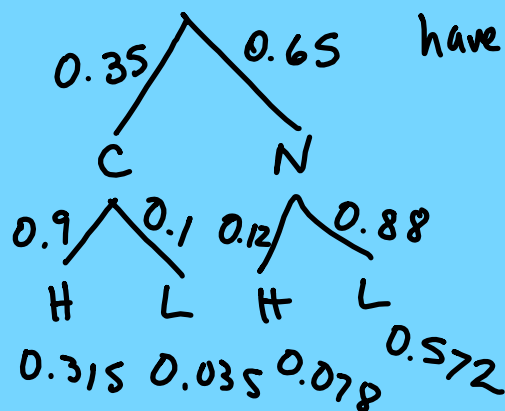
$$P(\text{Went/Know}) = P(J|M) = \frac{P(JM)}{P(M)}$$

↑
Given

$$P(A|B) = \frac{P(AB)}{P(B)}$$

$$= \frac{0.338}{0.338 + 0.264} = 0.561$$

Covid epidemic — 35% of students have C-19
 Of those with C-19, 90% have high temp
 — 12% of those with other illnesses
 have a high temp.



If a student has low/normal
 temp, what is the prob.
 he/she has the C-19?

$$\begin{aligned}
 P(C|L) &= \frac{P(CL)}{P(L)} \\
 &= \frac{0.035}{0.035 + 0.572} \\
 &\approx 0.0577
 \end{aligned}$$

$$P(A|B) = \frac{P(AB)}{P(B)}$$

EXPECTED VALUE (FAIR GAME THEORY)

Dice Game

Roll 1, 2, 3 Win \$10
 Roll 4, 5 Lose \$30
 Roll 6 Win \$25

Pay \$1 to play

$$E.V = (\text{prob})(\text{Gain/Loss})$$

Event	1, 2, 3	4, 5	6
Prob	$\frac{3}{6} = \frac{1}{2}$	$\frac{2}{6} = \frac{1}{3}$	$\frac{1}{6}$
Gain/Loss	$\frac{10-1}{1} = 9$	$\frac{-30-1}{1} = -31$	$\frac{25-1}{1} = 24$

$$E.V = \left(\frac{1}{2}\right)(9) + \left(\frac{1}{3}\right)(-31) + \left(\frac{1}{6}\right)(24)$$

$$\approx -1.83/\text{game}$$

\$1400 collision ins
 \$500 deductible
 (car is worth \$10,000.)

	Total car	≥ 5000	≥ 1000	No Acc.
Prob	0.05	0.02	0.03	0.9
gain/loss	$\begin{array}{r} 10,000 \\ - 500 \\ - 1400 \\ \hline 8100 \end{array}$	$\begin{array}{r} 5000 \\ - 1900 \\ \hline 3100 \end{array}$	$\begin{array}{r} 1000 \\ - 1900 \\ \hline -900 \end{array}$	-1400

$$(0.05)(8100) + (0.02)(3100) + (0.03)(-900) + (0.9)(-1400) = -820 \text{ per yr.}$$