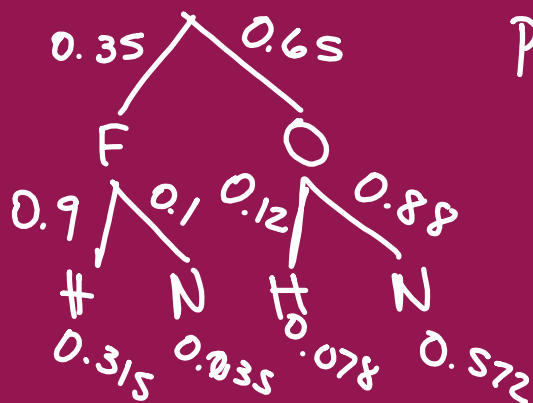


# CONDITIONAL PROBABILITY — has a known fact about the situation

Flu epidemic — 35% have flu

— of those with flu, 90% have high temp

— 12% of those with other illnesses have high temp



Prob of Flu & High temp?

$$P(FH) = 0.315$$

$$P(ON) = 0.572$$

$$P(H) = FH \text{ OR } OH$$

$$= 0.315 + 0.078$$

$$= 0.393$$

If a student with a normal temp is selected, what is the prob he/she has the flu?

$$P(\text{find} | \text{Know})$$

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

$$P(F|N) = \frac{P(FN)}{P(N)} = \frac{0.035}{0.035 + 0.572}$$

$$= 0.0577$$

# EXPECTED VALUE (Fair Game Theory)

	Dice		
	1, 2, 3	4, 5	6
Gain/Loss	Win <del>\$10</del> 9	Lose <del>\$30</del> -31	Win <del>\$25</del> 24
Prob	$\frac{3}{6} = \frac{1}{2}$	$\frac{2}{6} = \frac{1}{3}$	$\frac{1}{6}$

Pay \$1 to play

Expected Value =  
(Prob)(Gain/Loss)

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

$$= -1.83$$

Lose \$1.83/game

	Total car	\$5000 Accid	\$1000 Accid	No Accid
prob	0.05	0.02	0.03	0.9
Gain/ Loss	10,000 -1400 -500 <hr/> \$8100	5000 -1400 -500 <hr/> 3100	1000 -1400 -500 <hr/> -900	-1400

\$1400 per years  
 \$500 deductible  
 Car worth \$10,000

$$\begin{aligned}
 E.V. &= (0.05)(8100) + (0.02)(3100) + (0.03)(-900) \\
 &\quad + (0.9)(-1400) \\
 &= -\$820 \text{ per year}
 \end{aligned}$$