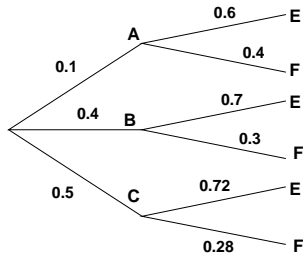


Week in Review #7

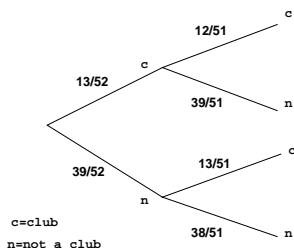
1. (a) $\frac{10}{120}$
 (b) $\frac{40}{210}$
 (c) $\frac{100+30+70+60}{260+330} = \frac{260}{590}$
2. (a) $\frac{P(F \cap E)}{P(E)} = \frac{\frac{13}{29}}{\frac{17}{29}} = \frac{13}{17}$
 (b) $\frac{P(G \cap F)}{P(F)} = \frac{\frac{6}{29}}{\frac{24}{29}} = \frac{6}{24}$
3. (a) $\frac{P(E \cap F)}{P(F)} = \frac{0.1}{0.3} = \frac{1}{3}$
 (b) $\frac{P(F^C \cap E)}{P(E)} = \frac{0.4}{0.5} = \frac{4}{5}$

4. tree



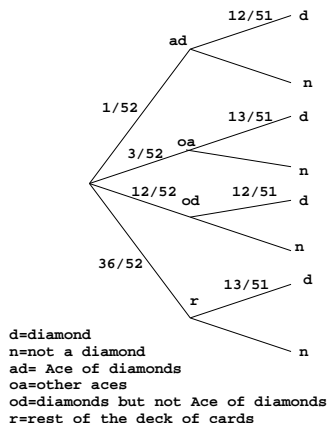
- (a) $0.4 * 0.7 = 0.28$
- (b) 0.72
- (c) $0.1 * 0.6 + 0.4 * 0.7 + 0.5 * 0.72 = 0.7$
- (d) $0.1 + 0.4 * 0.3 + 0.5 * 0.28 = 0.36$
 or $0.1 + 0.1 * 0.4 + 0.4 * 0.3 + 0.5 * 0.28 - 0.1 * 0.4 = 0.36$
- (e) $\frac{P(C \cap E)}{P(E)} = \frac{0.5 * 0.72}{0.1 * 0.6 + 0.4 * 0.7 + 0.5 * 0.72} = \frac{0.36}{0.7} = \frac{18}{35}$
- (f) $P(B) = 0.4$
 $P(E) = 0.7$
 $P(B \cap E) = 0.4 * 0.7 = 0.28$
 $P(B) * P(E) = 0.4 * 0.7 = 0.28$
 Since $P(B \cap E) = P(B) * P(E)$ then E and B are independent.
- (g) $P(A) = 0.1$
 $P(E) = 0.7$
 $P(A \cap E) = 0.1 * 0.7 = 0.07$
 $P(A) * P(E) = 0.1 * 0.6 = 0.06$
 Since $P(A \cap E) \neq P(A) * P(E)$ then E and A are not independent.

5. $P(1^{st}C | 2^{nd}C) = \frac{\frac{13}{52} * \frac{12}{51}}{\frac{13}{52} * \frac{12}{51} + \frac{39}{52} * \frac{13}{51}} = \frac{12}{51}$



or you could do the shortcut shown in class.

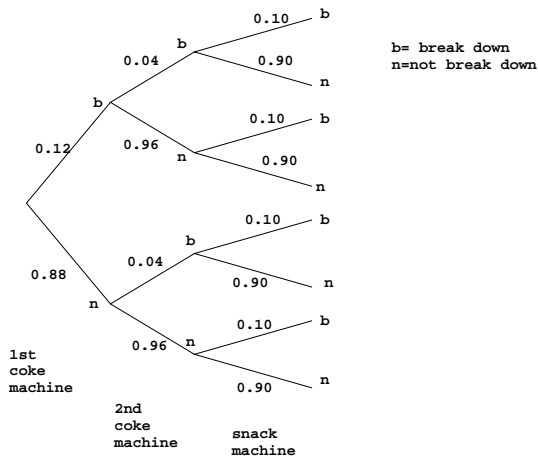
6. This has to be done by a tree.



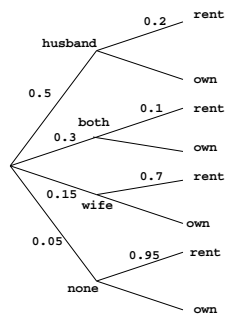
$$P(1^{st} A | 2^{nd} D) = \frac{\frac{1}{52} * \frac{12}{51} + \frac{3}{52} * \frac{13}{51}}{\frac{1}{52} * \frac{12}{51} + \frac{3}{52} * \frac{13}{51} + \frac{12}{52} * \frac{12}{51} + \frac{36}{52} * \frac{13}{51}}$$

$$P(1^{st} A | 2^{nd} D) = \frac{1}{13}$$

7. $0.12 * 0.96 * 0.9 + 0.88 * 0.04 * 0.9 + 0.88 * 0.96 * 0.1 = 0.21984$



8. the tree for this problem

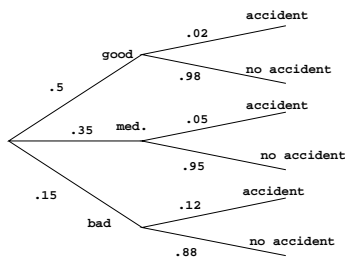


(a) $P(rent) = 0.3 * 0.1 + 0.5 * 0.2 + 0.15 * 0.7 + 0.05 * 0.95 = 0.2825$

(b) $P(own \cap husband) = 0.5 * 0.8 = 0.4$

(c) $P(w|rent) = \frac{.15 * .7}{0.2825} = 0.37168$

9. the tree for this problem



- (a) $P(A) = 0.5 * 0.02 + 0.35 * 0.05 + 0.15 * 0.12 = 0.0455$
- (b) $P(M|A) = \frac{0.35 * 0.05}{0.0455} = 0.3846$
- (c) $0.15 * 0.88 = 0.132$

- 10. (a) infinite discrete.
values: $X = 1, 2, 3, \dots$
- (b) finite discrete.
values: $X = 0, 1, 2, 3, \dots, 12$
- (c) continuous.
values: room temp $\leq x \leq$ temp of the heating element.
- (d) continuous.
values $0 \leq X \leq$ length of class time. either 50 min or 75 min.

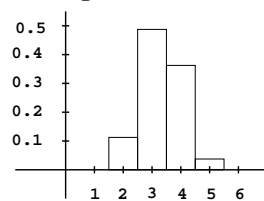
- 11. (a) $x = 2, 3, 4, 5$
- (b) prob dist.

x	2	3	4	5
prob	$\frac{C(5,2) * C(4,4)}{C(9,6)}$	$\frac{C(5,3) * C(4,3)}{C(9,6)}$	$\frac{C(5,4) * C(4,2)}{C(9,6)}$	$\frac{C(5,5) * C(4,1)}{C(9,6)}$

or

x	2	3	4	5
prob	$\frac{10}{84}$	$\frac{40}{84}$	$\frac{30}{84}$	$\frac{4}{84}$

- (c) Histogram



- (d) $\frac{30}{84}$
- (e) $\frac{10+40}{84} = \frac{50}{84}$

- 12. draw the tree to make this problem easier

x	-2	-1	0	1	2	3	4
prob	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{2}{15}$	$\frac{2}{15}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$