

4.4 Contingency Tables  
& 4.5 Conditional Probability

Study Ch. 4.4, p. 186 # 75-79

Study Ch. 4.5, p. 193 # 93, 97

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#### 4.4 Contingency Tables

p. 187 # 80

(acres)

<u>Size</u>	Full owner	Part Owner	Tenant	<u>Total</u>
< 50		64	41	
50 < 180	487	131	41	659
180 < 500	203			389
500 < 1000	54	91	17	162
$\geq 1000$	46	112	18	176
Total	1429	551		

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4.4 Contingency Tables

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Size	Full owner	Part Owner	Tenant	Total
< 50	639	64	41	744
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180 < 500	203	153	33	389
500 < 1000	54	91	17	162
≥ 1000	46	112	18	176
Total	1429	551	150	2130

$5 \times 3 = 15$   
cells

$$\begin{array}{r|l}
 - & 790 \\
 \hline
 & 639
 \end{array}
 \quad
 \begin{array}{r|l}
 - & 398 \\
 \hline
 & 153
 \end{array}
 \quad
 \begin{array}{r|l}
 & 117 \\
 \hline
 & 33
 \end{array}
 \quad
 \begin{array}{r|l}
 & 1980 \\
 \hline
 & 150
 \end{array}$$

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$5 \times 3 = 15$   
cells

33  
17  
18  
-----  
68

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4.5 Conditional Probability

p. 193 # 92

Balanced dime tossed 2X

HH, HT

TH, TT

Given:

A = event the 1st toss is heads

B = event the 2nd toss is heads,

C = event at least one toss is heads

Find:

a)  $P(B)$    b)  $P(B/A)$ ,   c)  $P(B/C)$

d)  $P(C)$    e)  $P(C/A)$ ,   f)  $P(C/(\text{not } B))$

$P(B/A)$  = prob of B given that event A has occurred.

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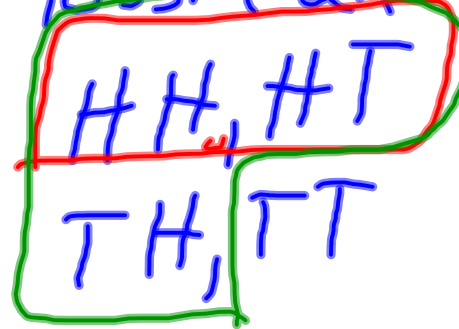
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4.5 Conditional Probability

p. 193 # 92

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d) P(C)    e) P(C/A),    f) P(C/(not B))

$$a) P(B) = \frac{f}{n} = \frac{2}{4} = \frac{1}{2}$$

$$b) P(\underline{B|A}) = \frac{1}{2}$$

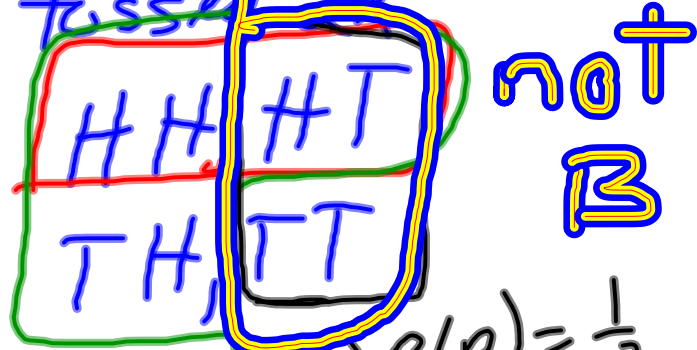
$$c) P(B|\underline{C}) = \frac{2}{3}$$

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4.5 Conditional Probability

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Balanced dime tossed 2x



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C = event at least one toss is heads

Find:

a) P(B) b) P(B/A), c) P(B/C)

d) P(C) e) P(C/A), f) P(C/(not B))

a)  $P(B) = \frac{1}{2}$

b)  $P(B/A) = \frac{1}{2}$

c)  $P(B/C) = \frac{2}{3}$

d)  $P(C) = \frac{3}{4}$

e)  $P(C/A) = \frac{2}{2} = 1$

$P(\text{at least 1 H} / 1^{\text{st}} \text{ H})$

f)  $P(C / \text{not } B) = \frac{1}{2}$

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## Conditional Probability Rule:

If A and B are any two events with  $P(A) > 0$ ,

then 
$$P(B/A) = \frac{P(A \& B)}{P(A)}$$

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	Fatal F	Not Fatal N	total
A	9	56	65
B	12	21	33
SA	8	57	65
US	5	244	249
other	36	92	128
Total	70	470	540

$$P(B) = \frac{33}{540}$$

$$P(B \& F) = \frac{12}{540}$$

$$P(F/B) = \frac{12}{33}$$

$$P(F/B) = \frac{P(F \& B)}{P(B)}$$

$$= \frac{\frac{12}{540}}{\frac{33}{540}} = \frac{12}{33} = \frac{4}{11}$$