16/10/15

Two-way table

Y \ X	0	1	2	
0	$\frac{1}{8}$	$\frac{1}{8}$	0	$\frac{1}{4}$
1	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{2}$
2	0	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$
	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	

marginal pmf for Y

marginal pmf for X.

a) Safety check: Do all entries sum to one?
" the marginal pmf's sum to one?

X and Y are dependent because
$P(X=2, Y=0) = 0 \neq \frac{1}{16} = \frac{1}{4} \cdot \frac{1}{4} = P_X(2) \cdot P_Y(0)$

Example 1.15 $P_{X|Y}(x|y) = \frac{P_{X,Y}(x,y)}{P_Y(y)}$

$P_{X|Y}(x|0) = \left(\frac{\frac{1}{8}}{\frac{1}{4}}, \frac{1}{2}, 0\right) \neq p_X(x)$

$P_{X|Y}(x|1) = \left(\frac{1}{4}, \frac{1}{2}, \frac{1}{4}\right)$, $P_{X|Y}(x|2) = \left(0, \frac{1}{2}, \frac{1}{2}\right)$