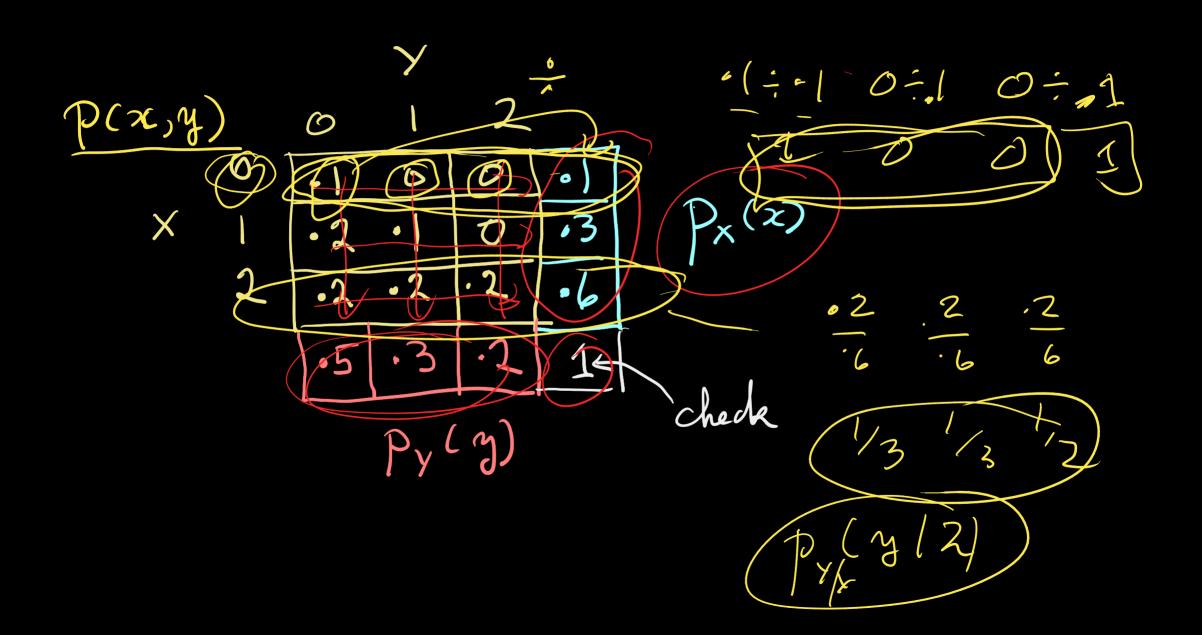
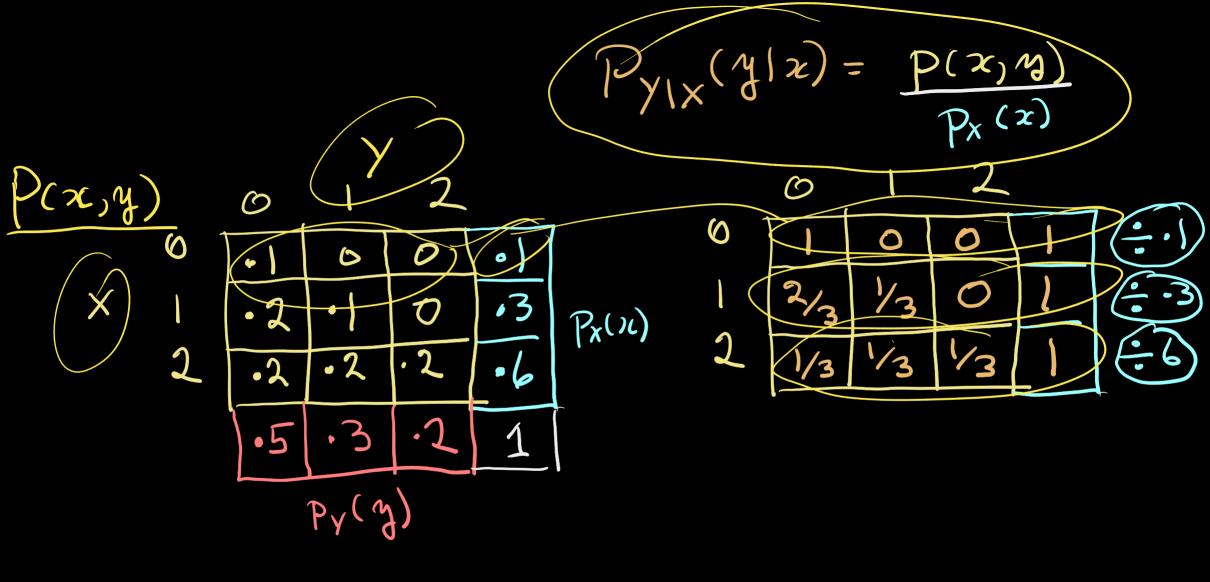
Chapter 3 - Part 2 P(A) B(A173) 3.5 Conditional distributions Recall: PCAOB) = PCB) PCBLA

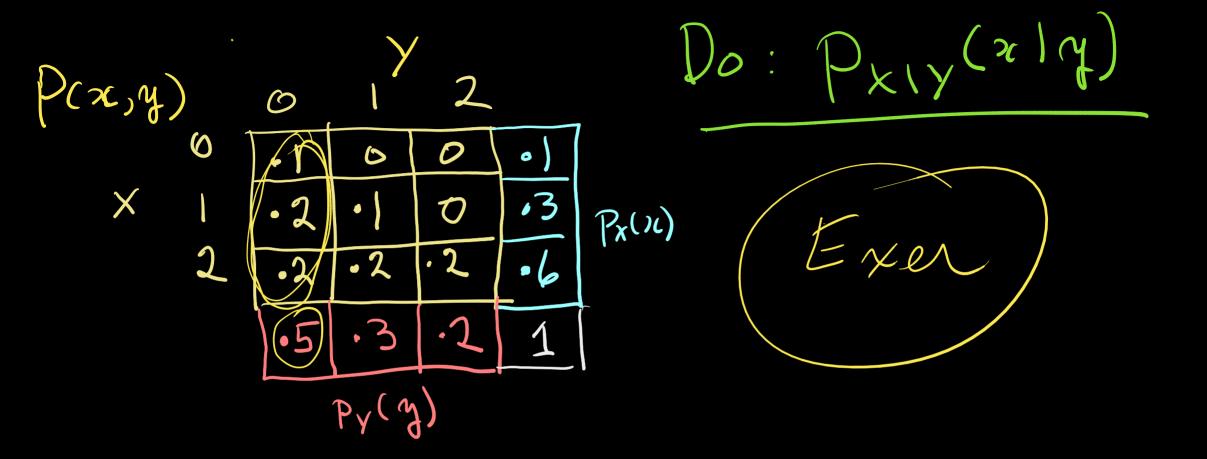
= Multiplication Rule: P(AB) = P(ADB)
P(B) Conditional Probability: if P(B)>0 P(B|A) = P(A)B) MP(A)>O PAIB X PBIA

Discrete Case: P(X = x | Y = y) = P(X = x)-20 × Py(y):0

Conditional probabilities	
Conditional probabilities from joint probabilities tables	
X = # of patients tested mill st	w
V= # positive	
Joint table  P(x,y)  O 1 2  O 2 0  2 2 2 2	







Example with formula: involving a pedestrion Suppose Xr Poisson (X)

and for each car accident the probability

that it involved a pedestrian or briggle is P Note: E(X) = X

W~ exponential (X), E(W) = 1/X

There a reason!

What is the distribution of 
$$Y$$
?

$$P(Y = ny) ??$$

$$P(Y = ny) ??$$

$$P(X = ny)$$

So 
$$p(x,y) = p_{x}(x) p_{y|x}(y|x)$$

$$= \frac{1}{x!} \lambda^{x} e^{-\lambda} \times \frac{x!}{y!(x-y)!} p^{x} (1-p)^{x-y}$$

$$= \frac{1}{x!} \lambda^{x} e^{-\lambda} \times \frac{x!}{y!(x-y)!} p^{x} (1-p)^{x-y}$$

$$= \sum_{x=0}^{\infty} p(x,y)$$

$$= \frac{p^{2}}{(1-p)^{2}} \frac{1}{q!} e^{-\lambda} \frac{1}{q!} e^{-\lambda} \frac{1}{(1-p)^{2}} \frac{1}{q!} e^{-\lambda} \frac{1}{q!} \frac{1}{(2-q)!} \frac{1}{(2-q)!} e^{-\lambda} \frac{1}{q!} e^{$$

$$= (\lambda p)^{m} \perp e^{-\lambda p}$$

$$y = 0, 1, ...$$
So  $\forall N$  Poisson  $(\lambda p)$