$$p(x \mid y) = \frac{p(x, y)}{p(y)}$$

$$\hat{p}_{\text{MLE}}(x) = \frac{\text{count}(x)}{N}$$

$$\hat{p}_{\text{MLE}}(x, y) = \frac{\text{count}(x, y)}{N}$$

$$\hat{p}_{\text{MLE}}(x \mid y) = \frac{\text{count}(x, y)}{N} \times \frac{N}{\text{count}(y)}$$

$$= \frac{\text{count}(x, y)}{\text{count}(y)}$$