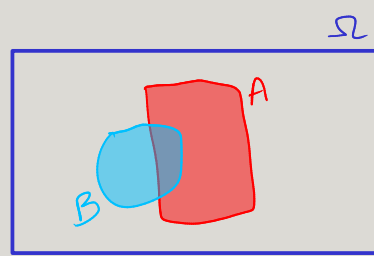


A, B events

$$Pr[A|B] = \frac{Pr[A \cap B]}{Pr[B]}$$



$$Pr[A] = \frac{|A|}{|\Omega|}$$

$$Pr[A|B] = \frac{|A \cap B|}{|B|}$$

X, Y are continuous RVs

$$f_{X|Y}(X=x|Y=y) = \frac{f_{XY}(X=x \cap Y=y)}{f_Y(y)} = \frac{f_{Y|X}(Y=y|X=x) f_X(X=x)}{f_Y(y)}$$

$$Pr[X \leq x | Y \leq y] = \frac{Pr[X \leq x \cap Y \leq y]}{Pr[Y \leq y]}$$

$$f_{X|Y}(X=x|Y=y)$$

$$Pr[X=x|Y=y]$$

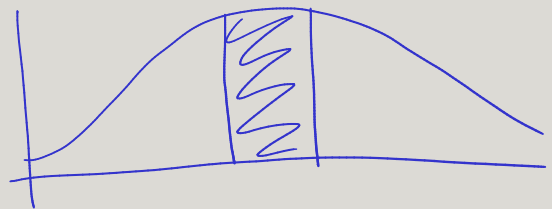
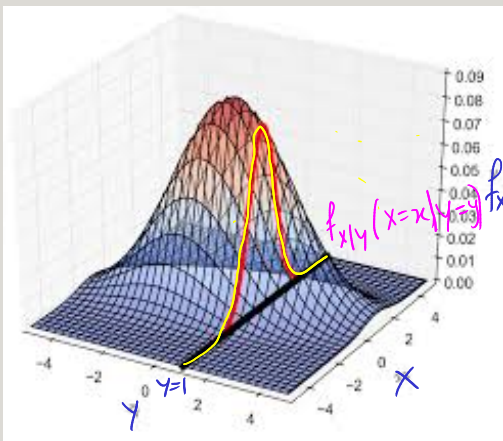
$$X \sim \mathcal{C} \quad Pr[X=x] = 0$$

$$X \sim \text{Uniform}[0,1] \quad f_X(x) = \begin{cases} 1 & x \in [0,1] \\ 0 & \text{otherwise} \end{cases}$$

$$Pr[X=0.5] = 0$$

$$Pr[0.5 \leq X \leq 0.5] = \int_{0.5}^{0.5} f_X(x) dx = 0$$

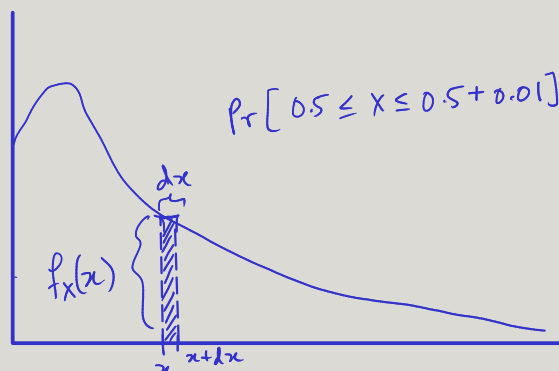
$$X=0.5 \Leftrightarrow 0.5 \leq X \leq 0.5$$



$$\Omega = \{1, 2, 3, 4, 5, 6\}$$

0.4 0.05 0.4

Xournal++



$$Pr[0.5 \leq X \leq 0.5 + 0.01] = \int_{0.5}^{0.5+0.01} f_X(z) dz \approx f_X(0.5) \cdot 0.01$$