

# GEOMETRIC DISTRIBUTION

Support:  $X \in \{0, 1, 2, \dots\}$

parameter:  $p \in (0, 1]$

$$P(X|p) = p \cdot \underbrace{(1-p)^X}_{\substack{\text{one success} \\ \text{X failures}}}$$

$$\mathbb{E}[X] = \frac{1}{p}$$

$$\text{var}[X] = \frac{1-p}{p^2}$$

Support:  $X \in \{0, 1, 2, \dots\}$

parameter:  $\lambda$  ("rate")

$$P(X|\lambda) = \frac{e^{-\lambda} \lambda^x}{x!}$$

$$E[X] = \lambda$$

$$\text{var}[X] = \lambda$$

POISSON  
DISTRIBUTION

Support:  $\mathbb{R}$

NORMAL  
DISTRIBUTION

parameters:  $\mu$   
 $\sigma^2$

$$P(X | \mu, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left[-\frac{(X-\mu)^2}{2\sigma^2}\right]$$

$$\mathbb{E}[X] = \mu$$

$$\text{var}[X] = \sigma^2$$