Section 1F. Common Distributions

Statistics for Data Science

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Random Variables: Common Distributions

Common discrete r.v.'s:

- *Bernoulli*, $X \sim \text{Ber}(p)$. Flip a coin with bias p; $X = 1$ if the coin turns out 'Head', $X = 0$ otherwise. $\mathbb{E}[X] = 1 \times p + 0 \times (1 - p) = p$
- *Binomial*, $X \sim \text{Bin}(n, p)$. Number of Heads after flipping n biased coins

$$p_X(h) = \binom{n}{h} p^h (1-p)^{n-h}$$

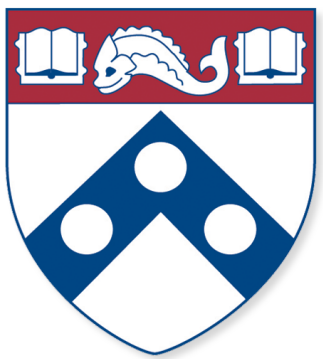
Common continuous r.v.'s:

- *Uniform*, $X \sim \text{Unif}(a, b)$:

$$f_X(x) = \begin{cases} \frac{1}{b-a} & \text{for } x \in [a, b] \\ 0 & \text{otherwise} \end{cases}$$

- *Normal* (aka Gaussian), $X \sim \mathcal{N}(\mu, \sigma^2)$:

$$f_X(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2\sigma^2}(x-\mu)^2}$$



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