Monte Carlo

Estimate expected values by sampling

$$\frac{\pi}{4} = \mathbb{E}\left[x^2 + y^2 \le 1\right]$$
 1.0 $M = 3000, \pi \approx 3.128$ $\approx \frac{1}{M} \sum_{s=1}^{M} [x_s^2 + y_s^2 \le 1]$ 0.5 $x_s, y_s \sim \mathcal{U}(0, 1)$ 0.0 0.5 1.0