

Expected Time Complexity

Expected Value

$T_A(x)$ time for alg A on input x

$$E[T_A(x)] = \sum t \cdot \text{Prob}[T_A(x)=t]$$

random var

(X)

time t
alg can
take

Die with prob $\frac{1}{2}$ of 1, $\frac{1}{10}$ for each of 2, ..., 6

$$\frac{1}{2} \cdot 1 + \frac{1}{10} \cdot 2 + \dots + \frac{1}{10} \cdot 6 = 2.5$$