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# Section 5.1 → Discrete Random Variables

$X$ → quantity
- → assumes all possible results of an observation
- → gaps exist between consecutive values

Discrete Random Variable

**Discrete Probability Distribution**
→ associates a probability to each possible value of $X$.

## John Kerrich's Coin

$P(\text{Heads}) \approx 0.51$

Toss the coin 2 times, let $X$ be the number of heads.

| $X$ | $P(X)$ | $XP(X)$ | $X^2P(X)$ |
|---|---|---|---|
| 0 | .2401 | 0 | 0 |
| 1 | .4998 | .4998 | .4998 |
| 2 | .2601 | .5202 | 1.0404 |
| | 1.0000 | 1.0200 | 1.5402 |

$\mu = \Sigma x \cdot P(x) = 1.02$

$\sigma = \sqrt{\Sigma x^2 P(x) - \mu^2}$

$= \sqrt{1.5402 - 1.02^2}$

$= .7070$

Variance $= \sigma^2 = .4998$

$P(0) = P(T \& T) = P(T) \cdot P(T) = .49 \cdot .49 = .2401$

$P(1) = P(T \& H \text{ or } H \& T) = P(T \& H) + P(H \& T)$

$= P(T) \cdot P(H) + P(H) \cdot P(T)$

$= .49 \cdot .51 + .51 \cdot .49$

$= .4998$

$P(2) = P(H \& H) = P(H) \cdot P(H) = .51 \cdot .51 = .2601$