

## Example

- Flip  $n$  coins.
- Let  $S_n$  be the number of heads.
- Let  $A_n$  be the fraction of heads.
- Since  $\mathbb{E}[X_1] = \text{Var}(X_1) = 1/4$ , we have

$$\begin{aligned}\mathbb{E}[S_n] &= n/2, & \text{Var}(S_n) &= \frac{n}{4}, \\ \mathbb{E}[A_n] &= 1/2, & \text{Var}(S_n) &= \frac{1}{4n}.\end{aligned}$$