Stopping Rule

- $\{X_n; n \geq 1\}$: set of RV's
- We do not observe all X_n, but stop observing them at some time
- When to stop is given by a "stopping-rule"
- **Stopping Rule**: Given $\{X_n; n \geq 1\}$, a stopping rule is a positive, integer-valued RV N such that, for each $n \geq 1$, the indicator function, I_n, of $\{N \geq n\}$ is a function of $X_1, ..., X_{n-1}$.
- **Stopping Rule** (more general): Given $\{X_n; n \geq 1\}$, a stopping rule is a positive, integer-valued RV N such that, for each $n \geq 1$, the indicator function I_n, conditional on $X_1, ..., X_{n-1}$, is independent of $\{X_i; i \geq n\}$.

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- **Wald's Equality**: Given a set $\{X_n; n \geq 1\}$ of IID RV's with mean $\bar{X}$ and a stopping rule N for $\{X_n; n \geq 1\}$, then we have for

$$S_N = X_1 + \ldots + X_N,$$

that

$$E[S_N] = \bar{X} E[N].$$