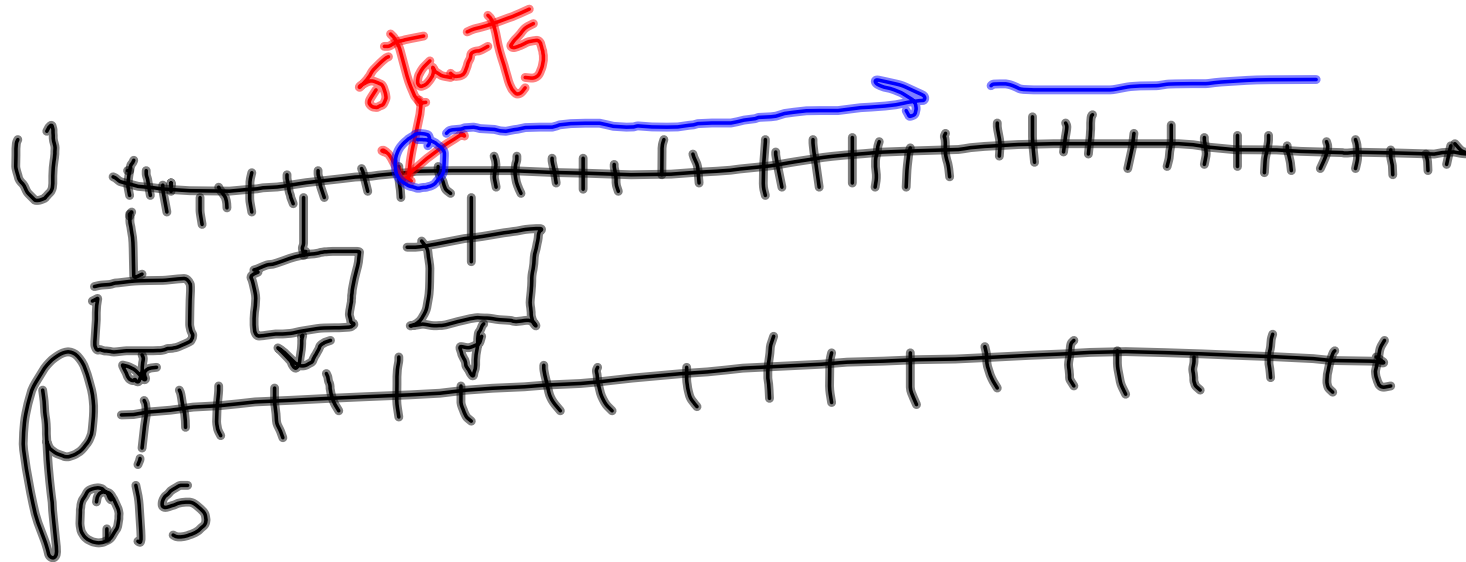
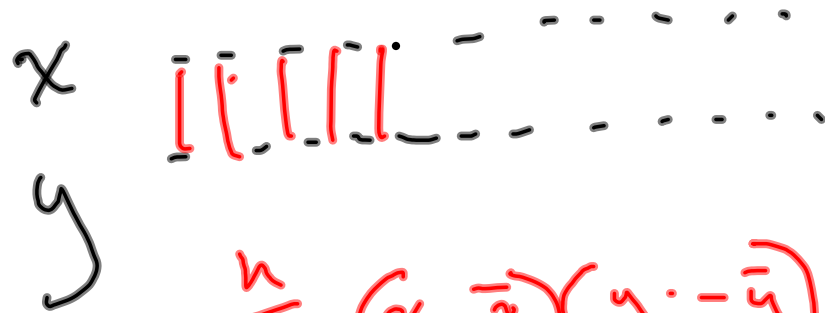


Random Number Generators



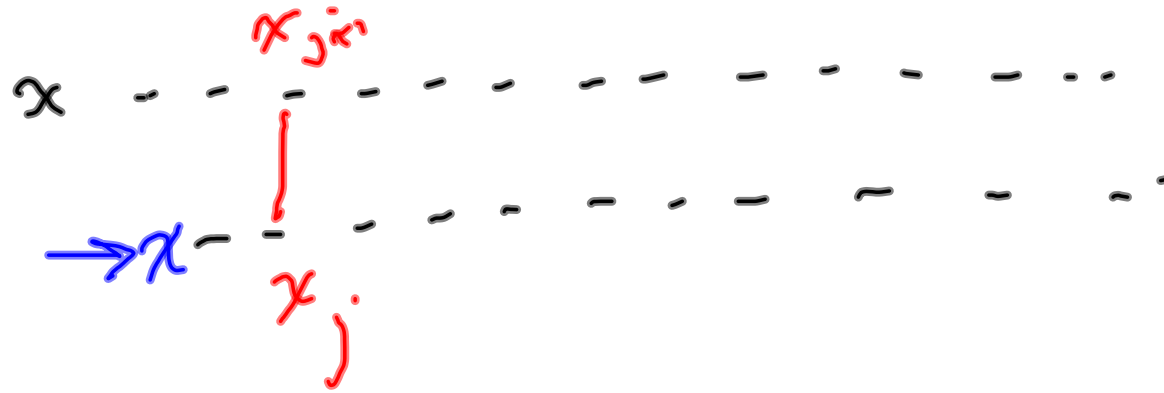
Serial Correlation

Correlation



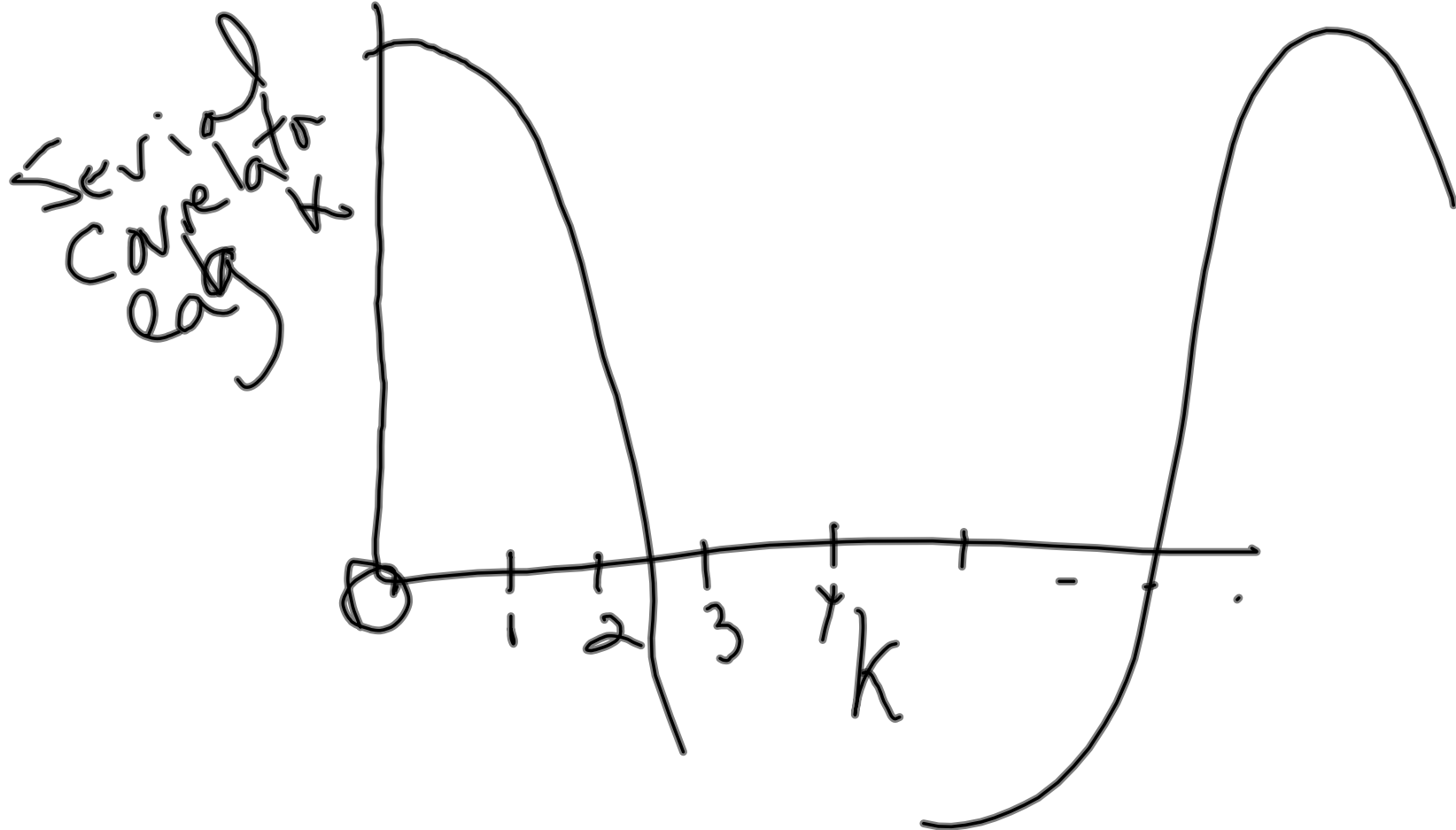
$$\text{Covariance} = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})$$

$$\text{Corr} = \frac{\text{Cov}(x, y)}{\sqrt{\text{Var}(x) \text{Var}(y)}}$$



$\text{Corr}(x, x_{\text{shifted by } j})$
"Serial Correlation lag j "

Correlogram



Die: 6 unique sides
 $\frac{1}{6}$ $p(\text{any particular } \#)$

Game: guess next #
 right: win \$20
 wrong: lose \$10

probability

$p(\text{win}) = \frac{1}{6} \cdot 20 = \frac{20}{6}$
 $p(\text{lose}) = \frac{5}{6} \cdot 10 = \frac{50}{6}$
 net: $\frac{20}{6} - \frac{50}{6} = -\frac{30}{6}$

utility

expectation

$$\text{Expected utility} = \sum_{j=1}^k p_j u_j$$

E_A For decision A

E_B For decision B
⋮

which decision has highest expected utility