Notes: Simulation

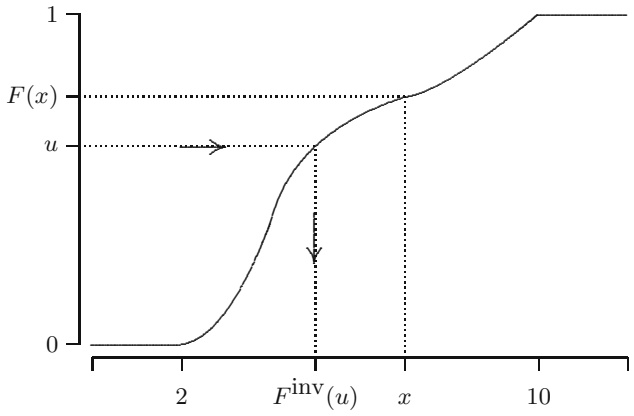
CS 3130 / ECE 3530: Probability and Statistics for Engineers

April 9, 2024

- What are statistical simulations and why? Random, complex, evaluate scenarios, predict outcomes.
- Generating random samples from distributions.
- Basic computer operation - random integers from 0-max
- convert this to uniform U(0,1)
- Example - how to generate samples from a Bernoulli distribution.

$$X = \begin{cases} 1 & U < p \\ 0 & U \geq p \end{cases}$$

- Example: A random variable Y has outcomes 1, 3, and 4 with the following probabilities: P(Y = 1) = 3/5, P(Y = 3) = 1/5, and P(Y = 4) = 1/5. Describe how to construct Y from a U(0,1) random variable.



- Continuous random variables.
- Example: exponential distribution
- Example: comparing jury rules