EE 381 Project 6

Due Date: 5-3-21

Instructions: The faculty member will facilitate completing this project.

Topic: Conclusion Markov chains and Probability

Simulating general two-state discrete time Markov chain and evaluating its steady state.

Exercise.

For the general two-state process the transition matrix Π is, $\Pi = \begin{bmatrix} 1 - \alpha & \alpha \\ \beta & 1 - \beta \end{bmatrix}$. Determine the steady state vector for the state vector $[\varphi_0 \ \varphi_1]$.

Computer Solution.

A computer simulation of two states (project 3) will be modified to determine the steady state.

Probability

The Birthday Problem

This a problem that can be solved using a computational solution.

Assume 365 days in a year and that people's birthdays are randomly distributed throughout the year. With k people in a room, what is the probability that at least two have the same birthday?

Theory:

Computer Solution:

Poisson Random Variable

Write a program in Python that recursively generates Poisson probabilities. Note the change in shape as the parameter increases.

Deliverables: Exercises (written theory can be done on a separate sheet of paper) and computer program solutions with output all in a single PDF.

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