

ECE 341 - Homework #11

Regression Analysis & Markov Chains - Summer 2023

Regression Analysis

The low temperature in June in Fargo, ND is available at

http://www.bisonacademy.com/ECE111/Code/Fargo_Weather_Monthly_Low.txt

1) Find the least-squares curve fit for this data as

$$T = ay + b$$

where T is the temperature in degrees F and y is the year.

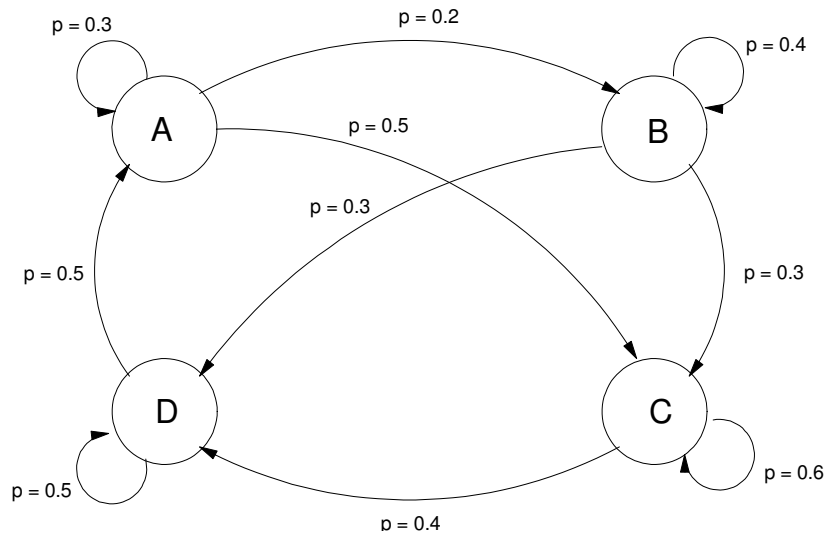
From this curve fit, how much has June in Fargo warmed up since 1942?

2) Determine the correlation coefficient between

- The low temperature in January and February
if January was cold, will February be cold?
- The low temperature in January and July.
if January is cold is July going to be cold?

Markov Chains

Four people are playing a game of hot potato. Each second, a player can keep the potato or pass it to another player. The probability of each decision are as follows



3) Assume player A starts with the potato. Determine the probability that each player has the potato after 10 tosses using matrix multiplication.

4) Assume player A starts with the potato. Determine the probability that player A has the potato after k tosses using z -transforms.

- What is the probability that A has the potato after an infinite number of tosses?

5) Assume player A starts with the potato. Determine the probability that A has the potato after an infinite number of tosses using eigenvalues and eigenvectors.