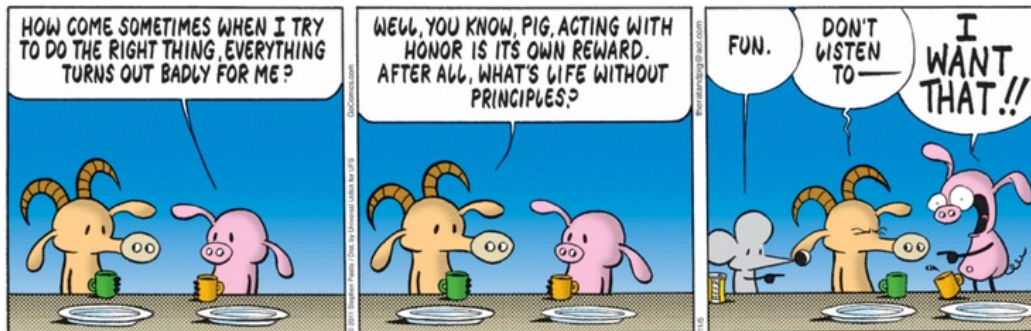


CSCI 3202

Lecture 30

November 5, 2025



Pearls Before Swine by Stephan Pastis.

<https://www.gocomics.com/pearlsbeforeswine>

Announcements

- Project Intermediate Report due Today
- HW #7 is due on Friday, 11/7 by 11:59 pm
- You may resubmit Worked Out Problems (Q13-Q20) only from the midterm for regrading. The points you receive will replace your original score on the midterm. If you do not submit anything, there will be no change in your score. You have until Friday, November 17 to submit. No late submissions will be accepted
- Before calculating your final grade, I will add 5 points to your midterm exam score due to the length of the exam
- These points will only count towards your midterm score. They will not count as extra credit toward your course grade

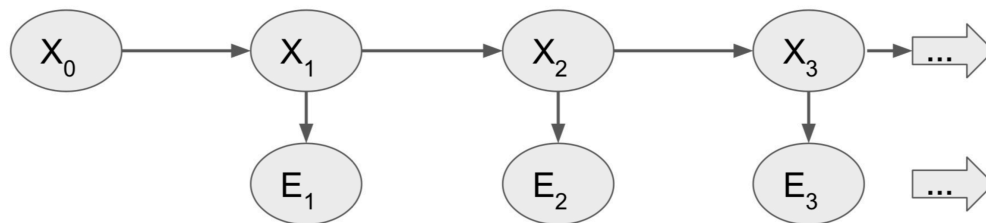
Project

- Intermediate report for project due Wednesday, November 5, 2025
- Turn in a Jupyter notebook or Zip file
 - Include your code
 - Write a paragraph describing your results so far
- For Mancala:
 - Game completely implemented, all rules
 - Random player implemented and working

- Play random vs. random player for 100 games and report statistics for each random player separately (Player 1 vs. Player 2)
 - Games won, %
 - Games lost, %
 - Games tied, %
- For both players
 - Average number of turns per game (count the total number of times either player drops stones into a pit). Note this is the number of turns, not the number of stones or pits.
 - Answer question: Is there a first move advantage? If so, how much?
 - Game should run without error for 100 games
 - Turn in code and answer questions in Canvas
- For "Choose Your Own"
 - Show me functional code for your game or agent
 - How do you know it is running correctly?
 - What do you have left to complete?
 - Turn in code and answer questions in Canvas
- There is an assignment in Canvas where you can turn in your assignment
- [CSCI 3202 Course Project 2025.pdf](#)

Hidden Markov Models

- In a Hidden Markov Model, we know some states, but we don't know the states we want
- We have evidence about these states
- We have a sequential series of states (Markovian process) that are related to each other



- We have a prior knowledge about the distribution of the states (X_0 here)
- We have conditional probability tables for the states and for the evidence
- We make assumptions about the conditional independence of the states and the evidence that allow us to (more easily) solve for the unknown states

- Assume Measurement E_t is conditional independent of all previous measurements and states, given the state X_t

$$P(E_1|X_0) = P(E_1|X_1)$$

$$P(E_2|X_0, X_1, E_1) = P(E_2, X_2)$$

and so on...

- We use Bayesian Models to determine the most likely values of each state
- Another example: <https://www.geeksforgeeks.org/machine-learning/hidden-markov-model-in-machine-learning/>
- [Hidden Markov Models.pdf](#)

Upcoming

- Viterbi Filtering
- Machine Learning
- Quiz #10 on Hidden Markov Models