Introduction

Administrivia

- https://cs.pomona.edu/classes/cs152/
  - Assignments (start every Thursday; due in 1 week)
  - Projects (start every Tuesday; due in 1 week)
  - Grading (questionnaires, assignments, projects)
  - Policies

Projects

1. Individual Proposals (due week 3)
2. Introduction Outline (due week 4)
3. Related Works Search (due week 5)
4. First Project Check-In (due week 6)
5. Introduction and Related Works Draft (due week 7)
6. Methods Outline (due week 9)
7. Second Project Check-In (due week 10)
8. Discussion Outline (due week 11)
9. Complete Rough Draft (due week 13)
10. Completed Project (due week 15 or finals)

Artificial Intelligence Disclaimers

- No background needed
- No expensive resources
- You don't need a massive dataset
- Anthropomorphism can be a big problem
- NNs are just a software component
- Creativity is not random
- Not AGI

Neural Network Applications

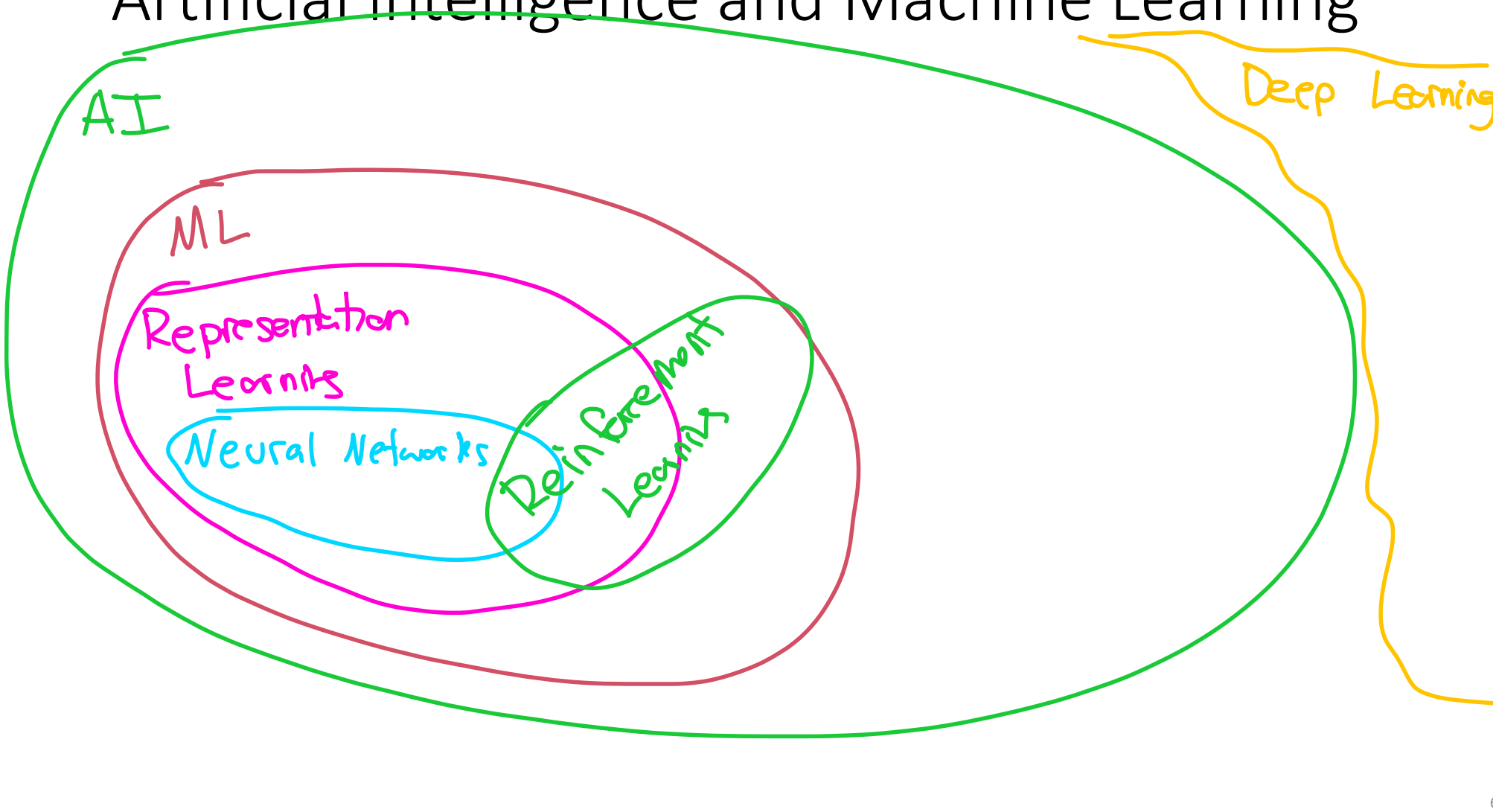
- Evaluate players for fantasy football
- Drive a robot
- Predict behavior (e-commerce)
- Music recs
- Medical imaging
- Machine translation
- Image classification
- Sound classification
- Game theory stuff
- Image / audio / text generation

- Object detection
- Semetic segmentation
- Instance segmentation
- Regressions

Project Types

- Application
- Research
- Ethical Studies

Artificial Intelligence and Machine Learning

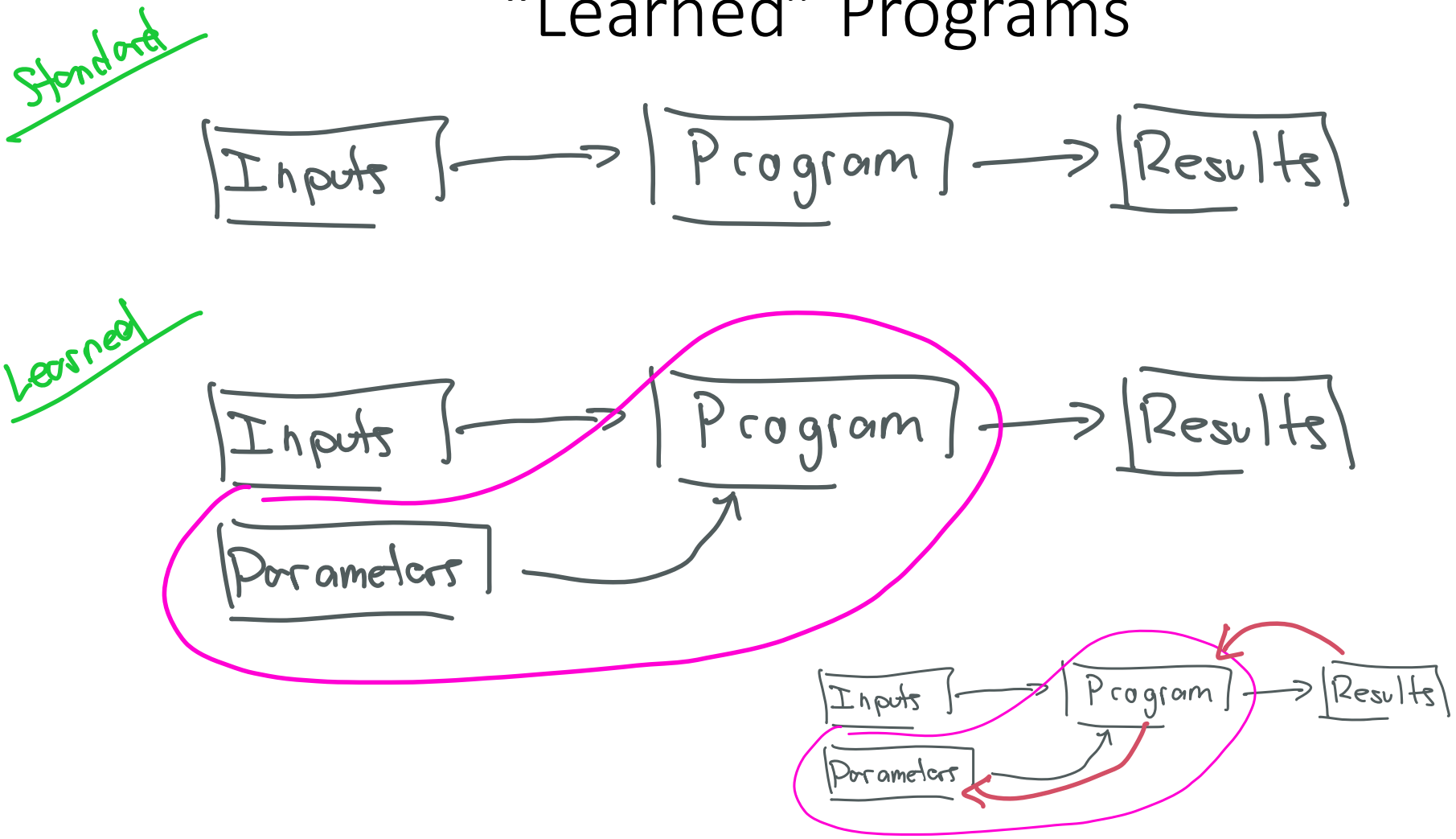


Artificial Intelligence and Machine Learning

ML

- Supervised
  - Regression, classification, search, recommendation
  - Labeled Data
- Unsupervised
  - Clustering, PCA
  - No labels
- Reinforcement
  - Delayed Labeling
- Hybrid

“Learned” Programs



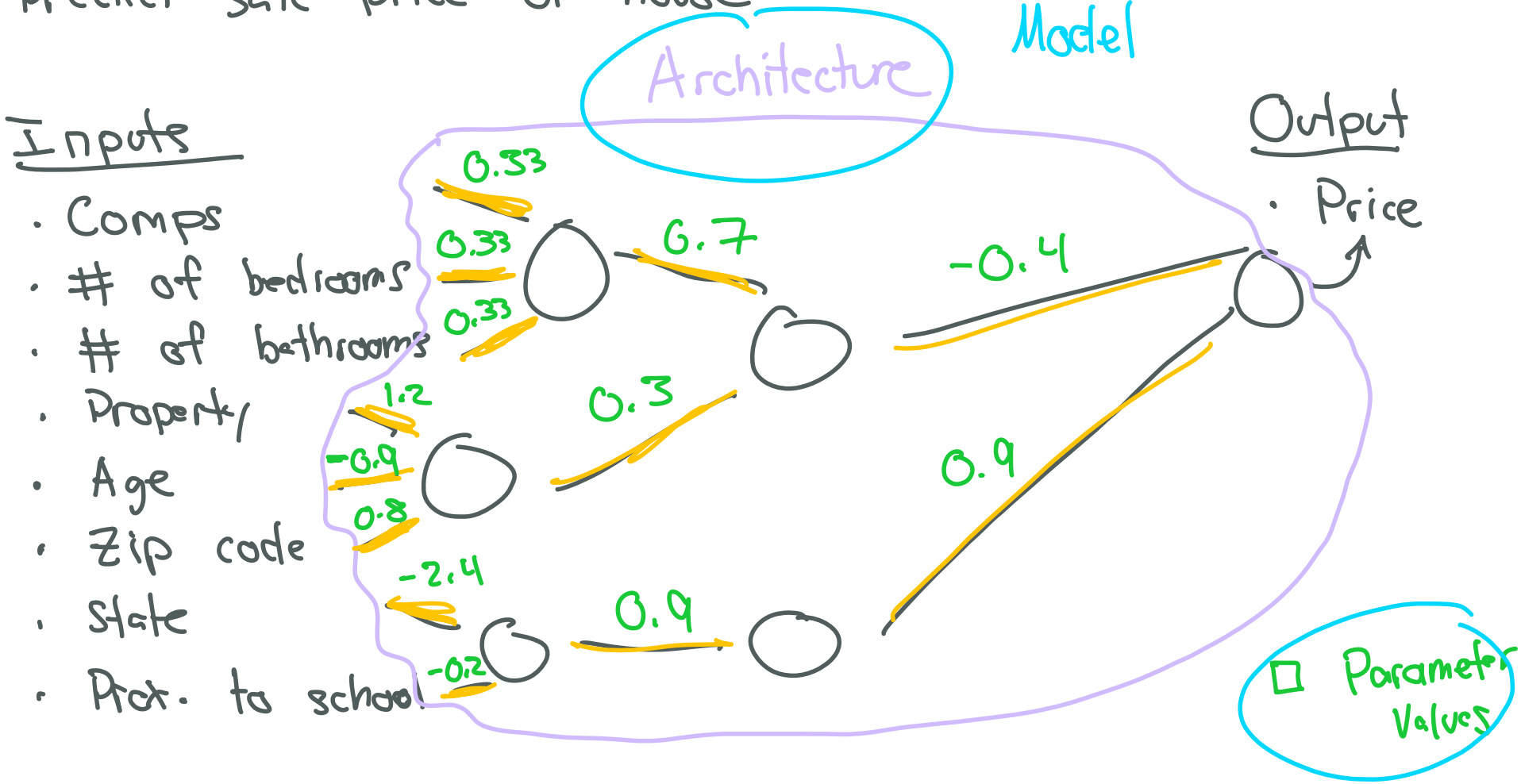
Neural Networks

Regression

Example

Predict sale price of house

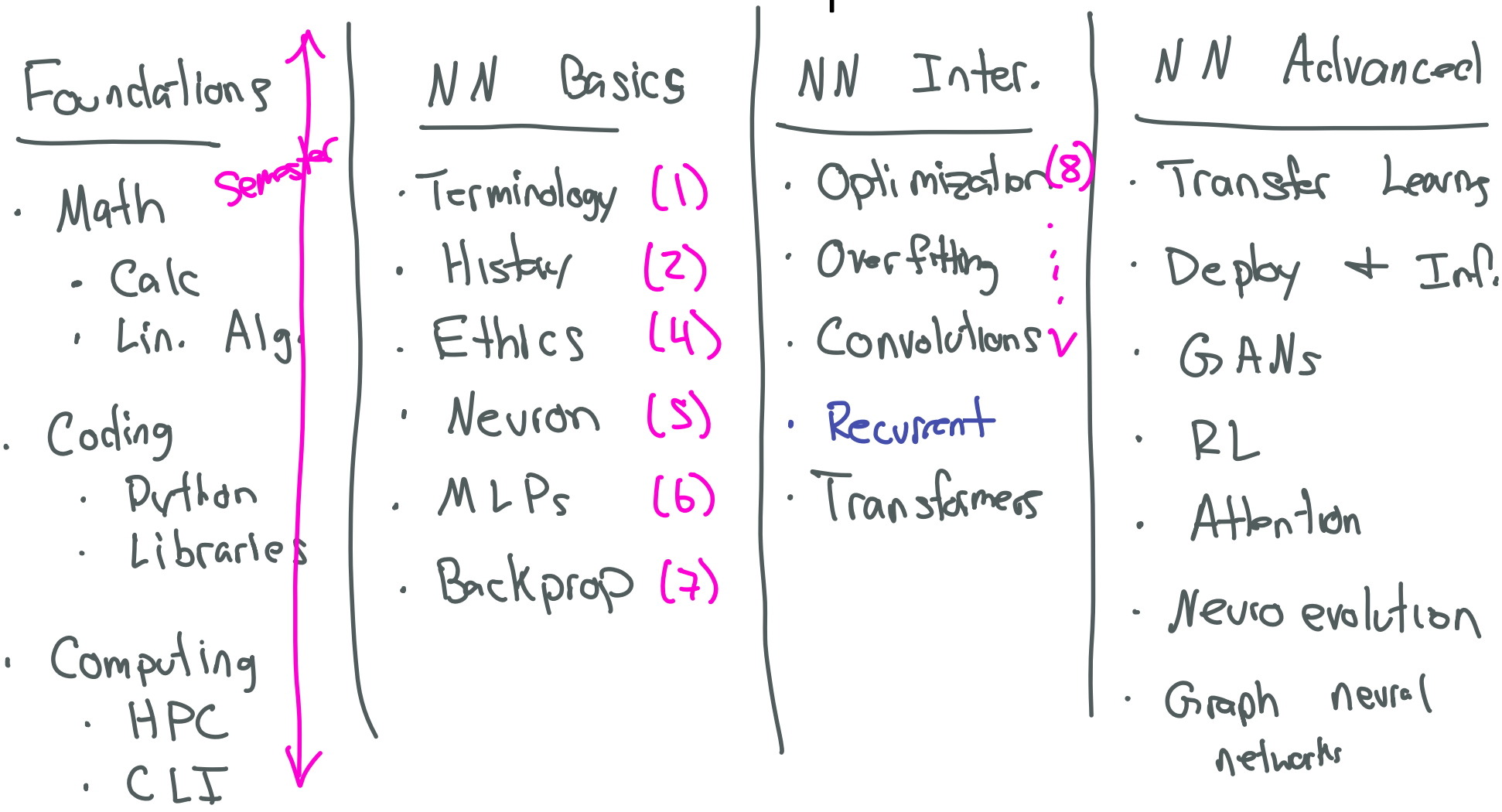
"Model"



Limitations

- They only learn from what you put in front of them
- They produce a guess/estimate. Check the output.
- Easy to create an abomination!
  - ↳ perpetuate human bias

Semester vs. Topic Timelines



History

Alternative Names

- Cybernetics, Connectionism, Artificial NN, Deep Learning

1943: Neuron

1958: Perceptrons (Neuron + activation)

1969: Reached limits

1970s - 80s: AI winter

1980s:
- Multi-Layer Perceptrons
- Ended the 1st winter
- Universal Approximation Theorem