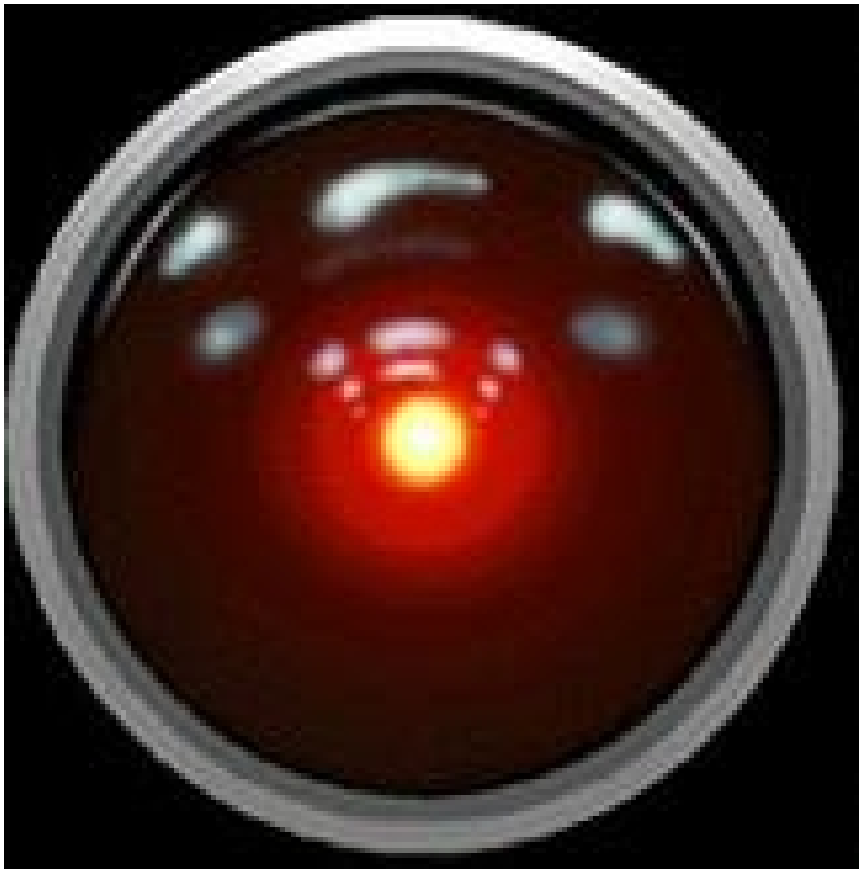
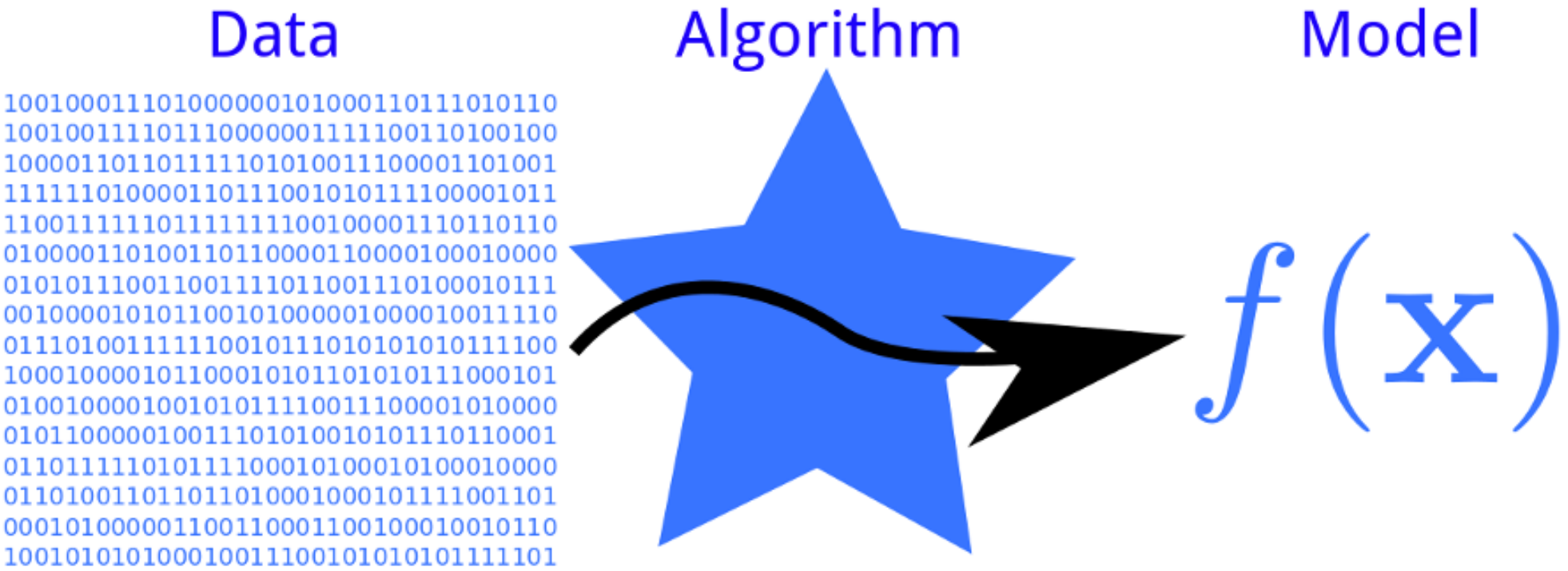


CS 378: Autonomous Intelligent Robotics

Instructor: Jivko Sinapov

http://www.cs.utexas.edu/~jsinapov/teaching/cs378_fall2016/

Machine Learning (and your projects...)



Announcements

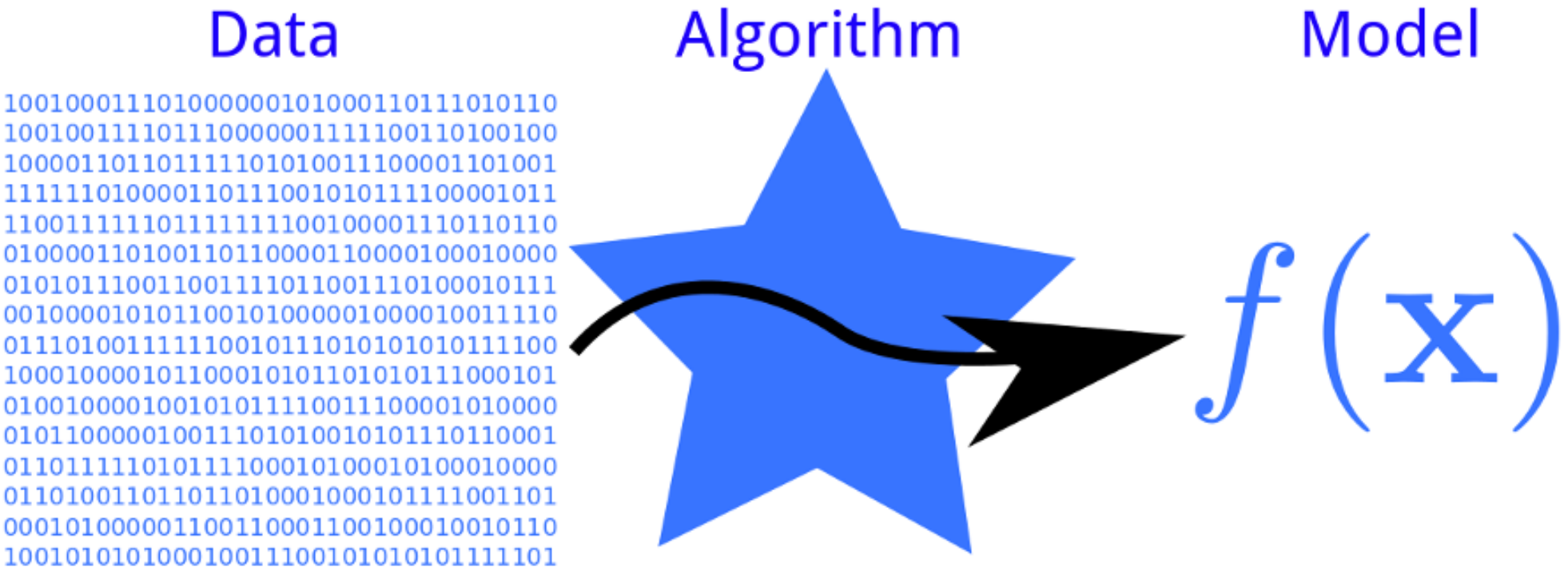
- Next week: project proposal presentations
- Sign up for a slot ASAP
- Presentation guidelines available on course webpage

Fall Undergraduate Research Symposium

- This Saturday 10 am – 5 pm at CLA
- FRI session at 1 pm – 2:15 pm at CLA 0.126
- Maxwell Svetlik, Nick Walker and Rishi Shah will be presenting a paper titled:

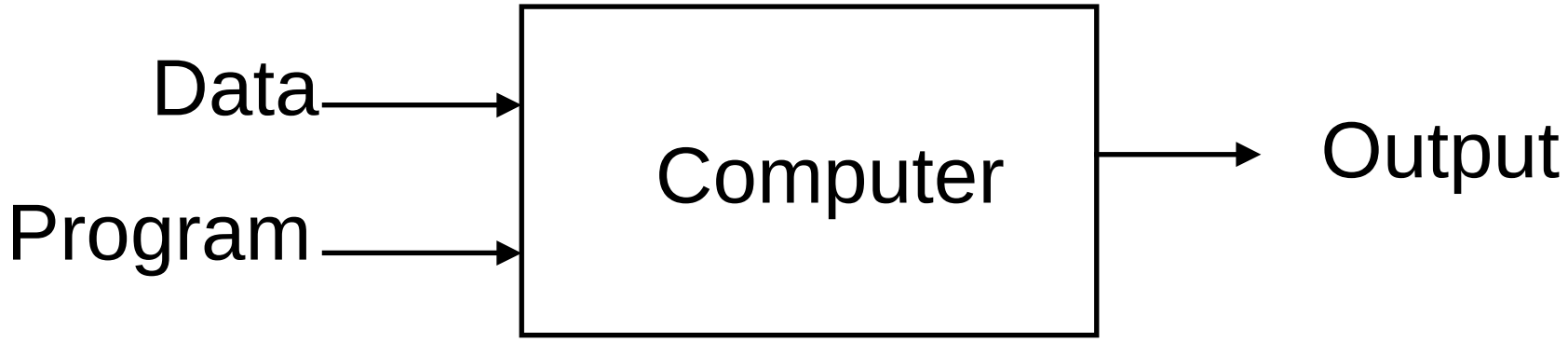
  “Automatic Curriculum Graph Generation for Reinforcement Learning Agents”

Machine Learning (and your projects...)

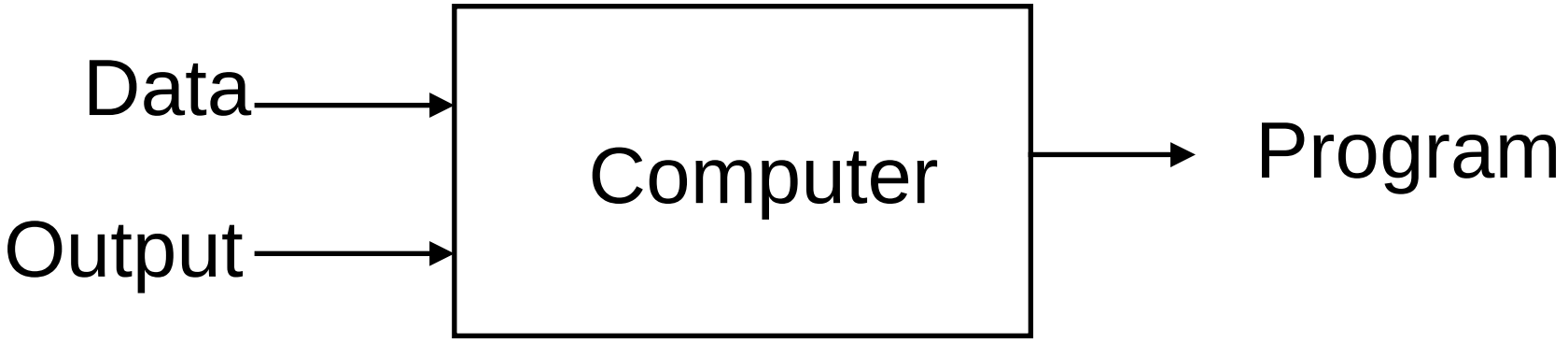


What is Machine Learning?

Traditional Programming



Machine Learning



[credit: Pedro Domingos]

Machine Learning Frameworks

	supervised	unsupervised
discrete	classification or categorization	clustering
continuous	regression	dimensionality reduction and manifold learning

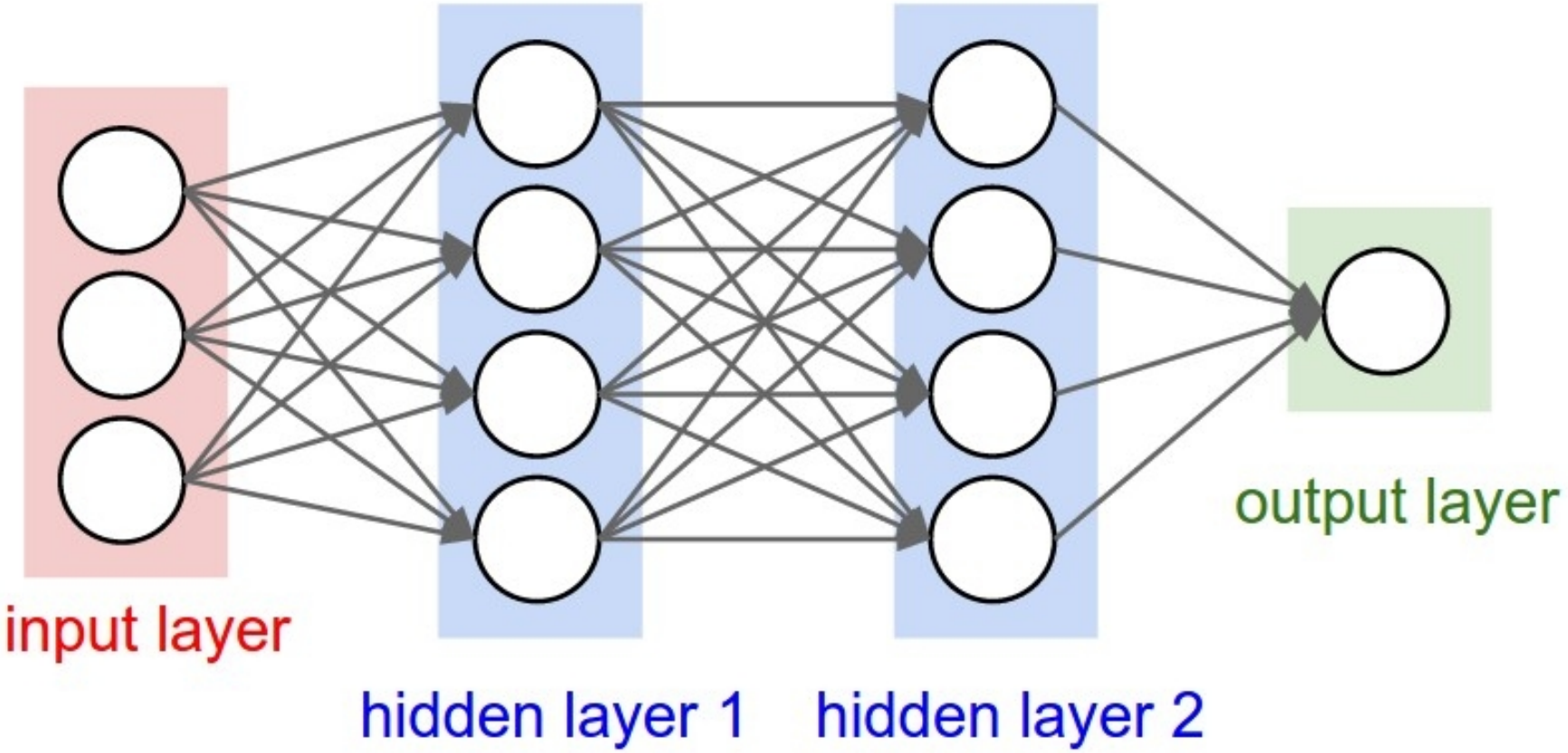
Another way to look at it..

- Supervised Learning: training data consists of labeled (x,y) pairs
- Semi-supervised Learning: some training data is labeled but most is not
- Reinforcement Learning: training data consists of (state, action, next state, reward) tuples

Classification Example using WEKA

http://www.cs.waikato.ac.nz/ml/weka/downloading.html

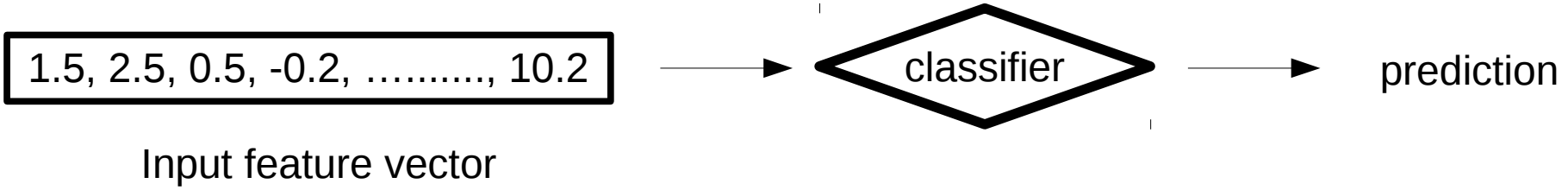
Feed-Forward Neural Networks Videos



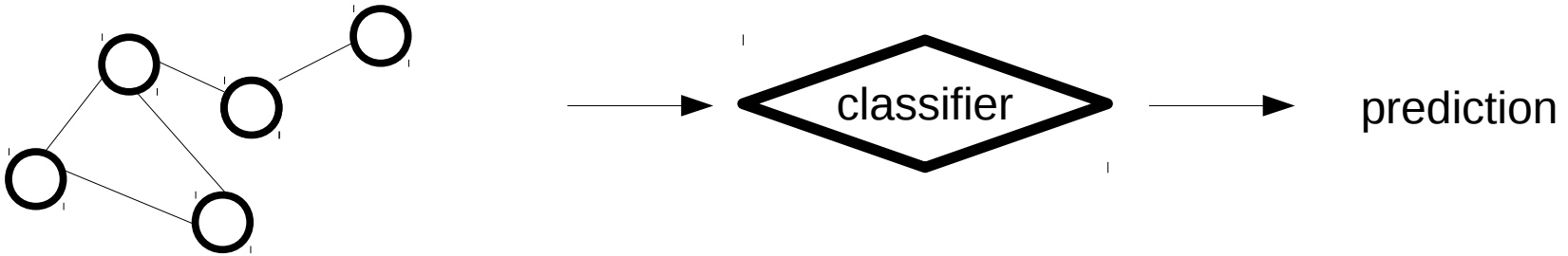
[http://cs231n.github.io/assets/nn1/neural_net2.jpeg]

Some additional ML problems...

Structured Input Problems

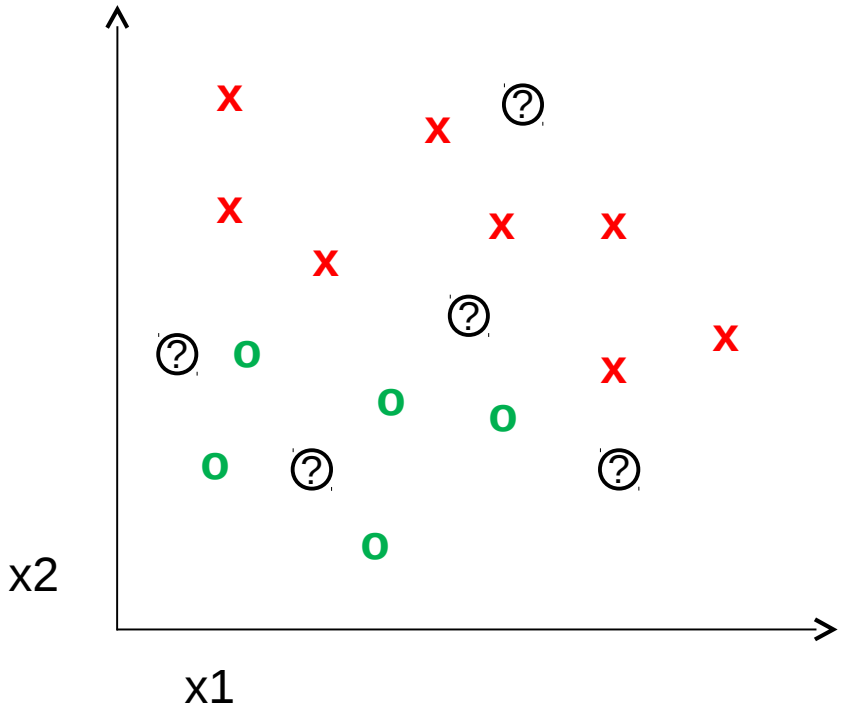


Input feature vector



Input graph

Active Learning / Sampling



Which unlabeled data point should be labeled next?

Machine Learning and Your Project

- Do you intend to use machine learning as part of your project?
- If so, how? Questions?

THE END