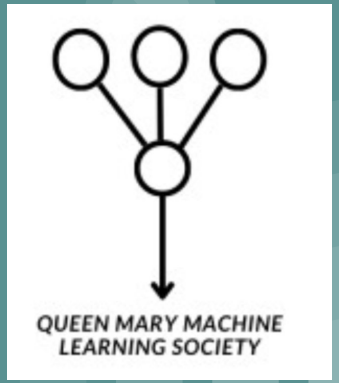
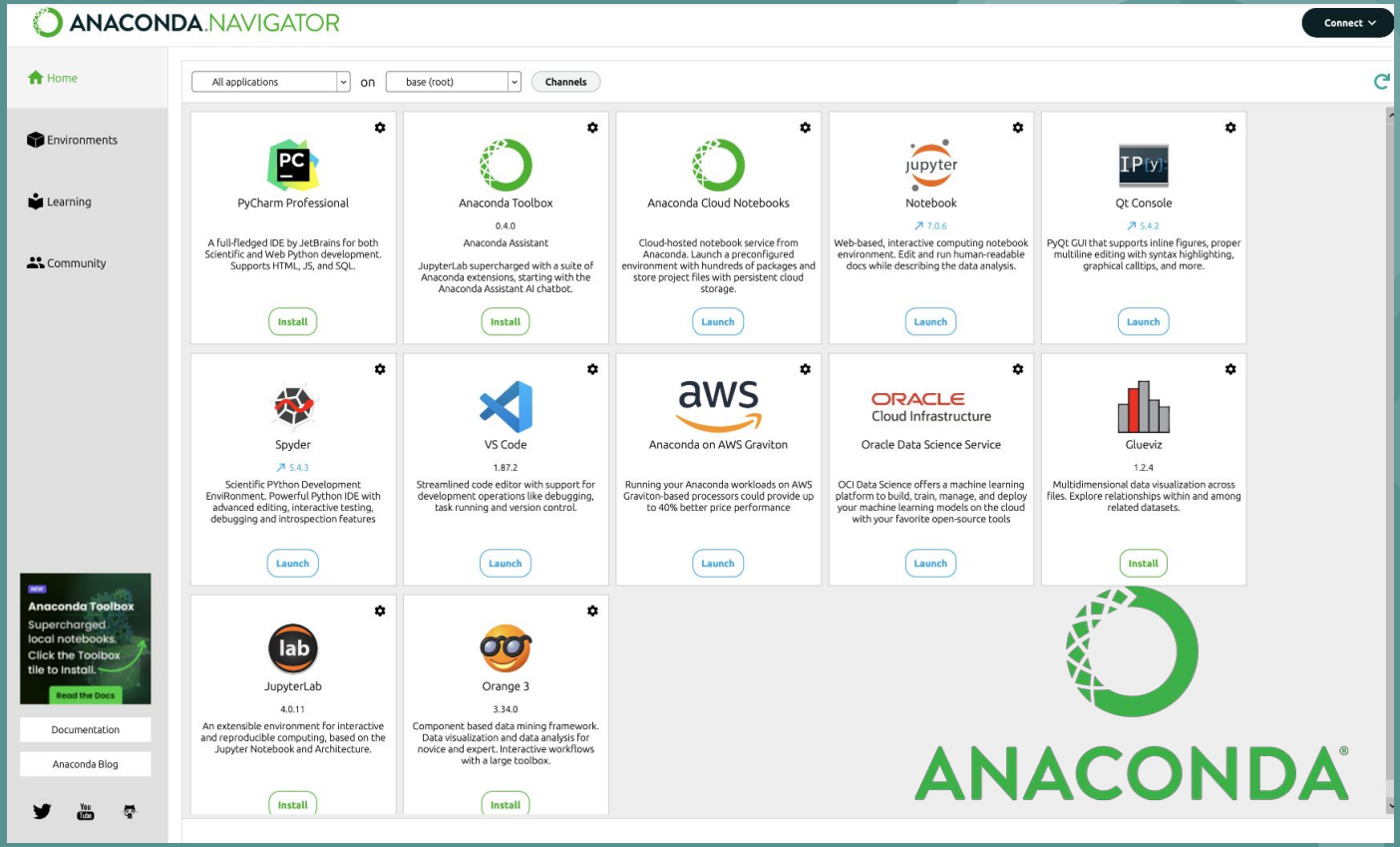
Introduction to Machine Learning (ML)



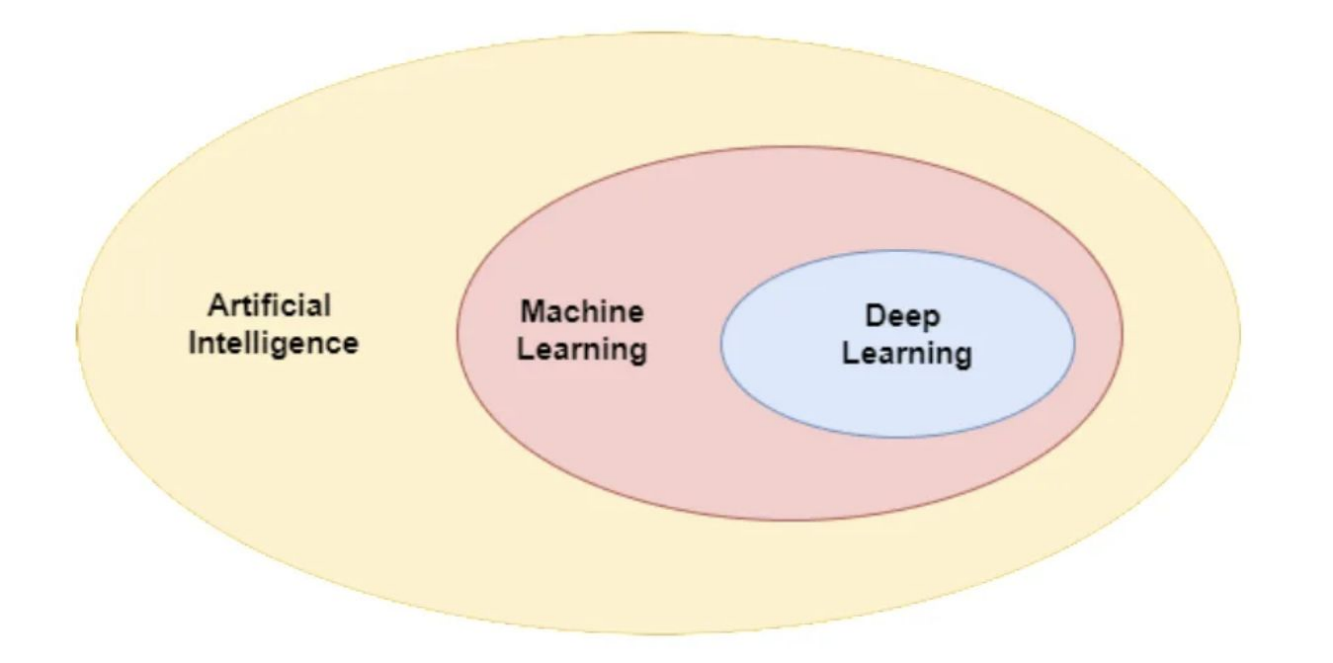
Software / Python



What is Machine Learning ?

“ Machine learning is the science of getting computers to act without being explicitly programmed ” - Andrew Ng

Artificial Intelligence and AI



What is Artificial Intelligence?

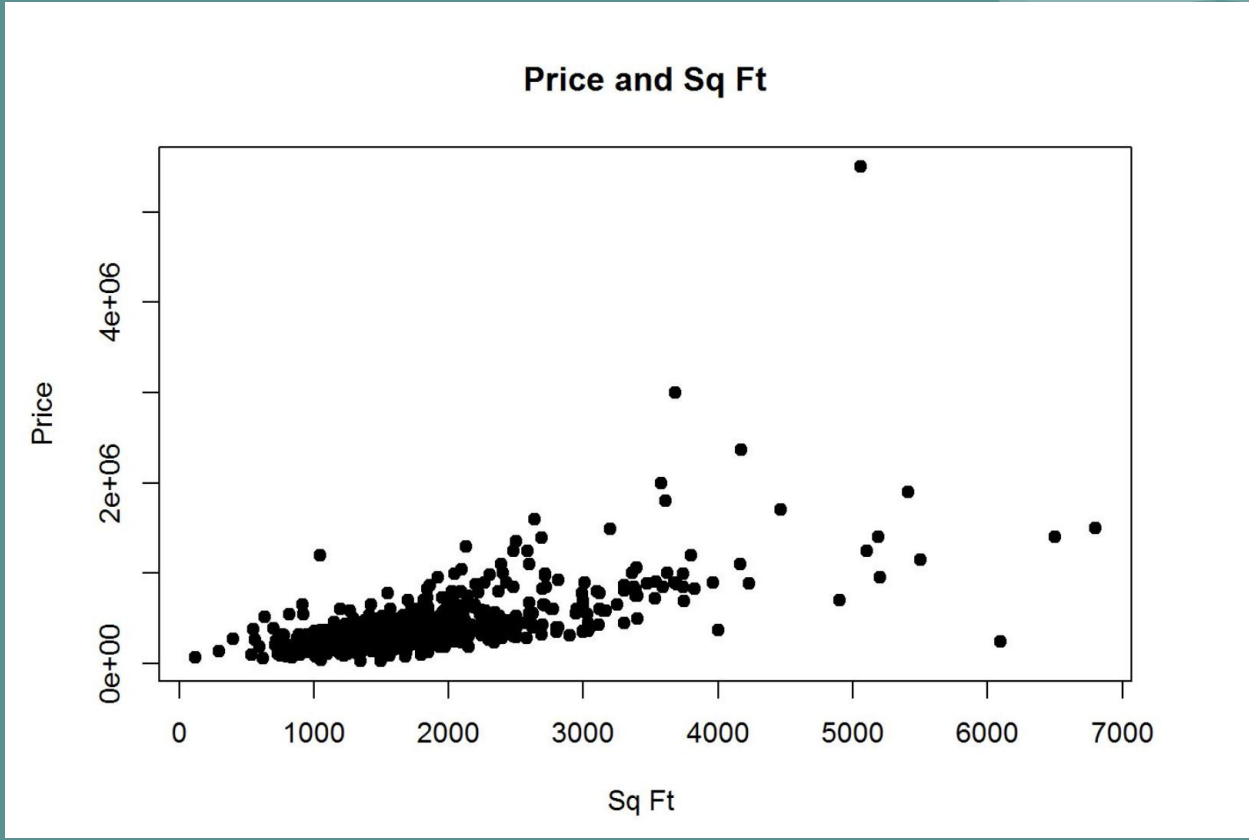
“Artificial intelligence (AI) is the broader field focused on creating machines capable of performing tasks that mimic human intelligence, such as reasoning, planning, and language understanding. Machine learning (ML), a subset of AI, specifically involves algorithms that enable machines to learn from data and improve automatically, without explicit programming for each task.” - GPT-4o

Structure of the course (for now)

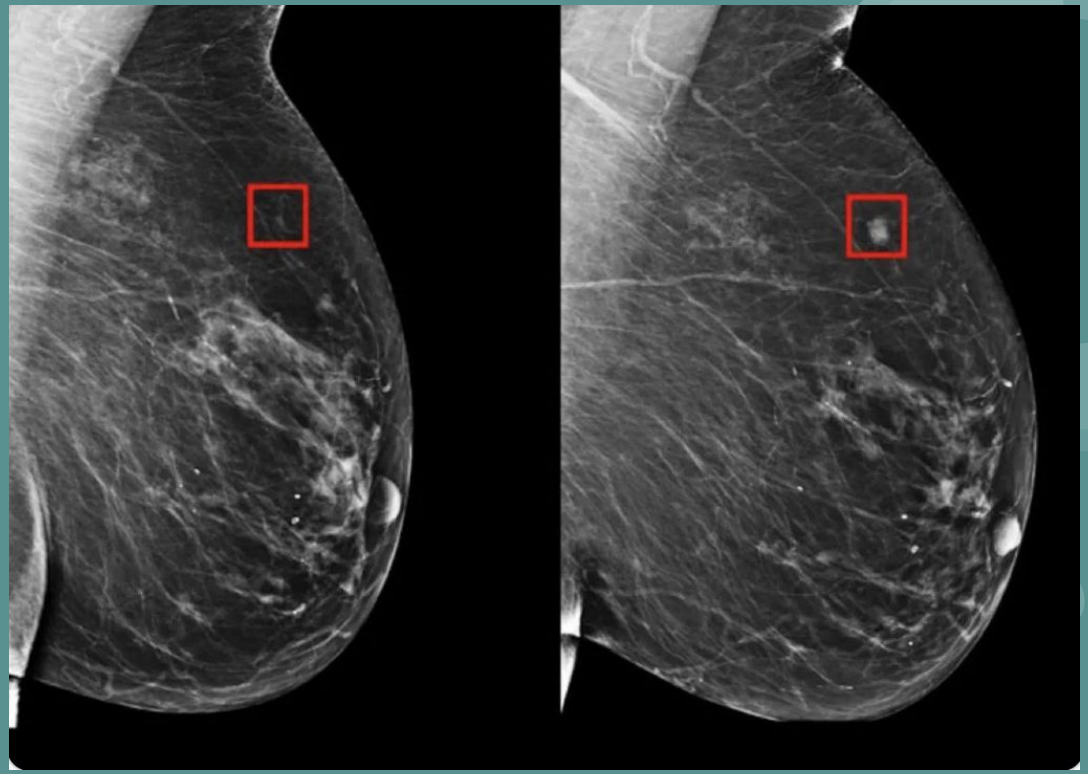
- Supervised Learning
  - Simple Linear Regression
  - Multiple Linear Regression
  - Logistic regression
  - Regularization Techniques
- Deep Learning
  - Neural Networks
  - Convolutional Neural Networks
  - Transformers and Large Languages Models (LLMs)

- Unsupervised Learning
- Reinforcement Learning (RL)

Supervised Learning



Cancer Detection 5 Years in Advance



https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2824353#:~:text=In%20this%20retrospective%20population%2Dbased,to%206%20years%20before%20diagnosis.

Applications

Application	Input `X`	Output `Y`
Email spam detection	Emails	spam or not
Image Classification	Images (mixed)	Cat / Dog
Self-driving car	Images, sensors	move or not
House price prediction	Area, floors	Price

A couple background questions…

Let’s Get Our Hands Dirty