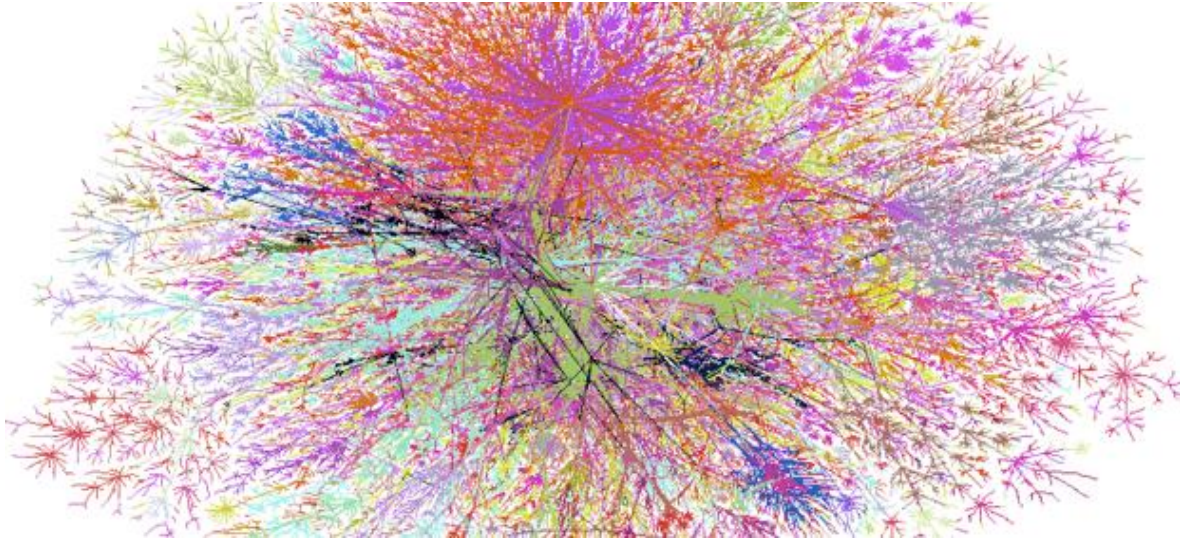


A Quick Introduction to Machine Learning

Lecturer: John Guttag

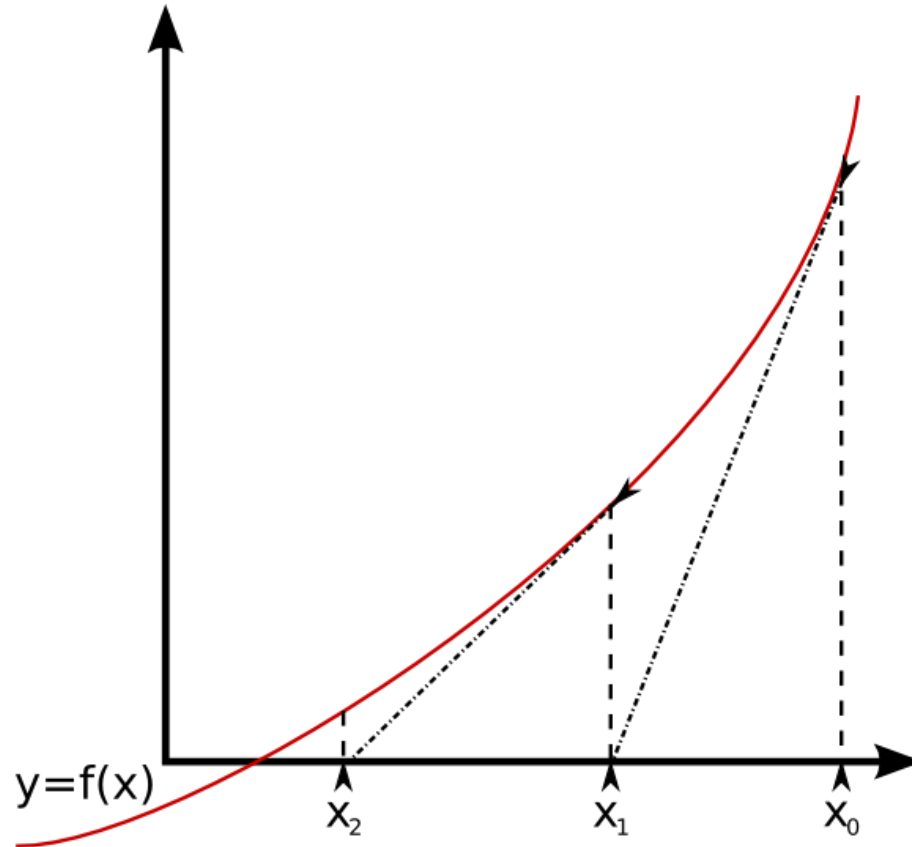
Big Data



What Is Machine Learning



Newton-Raphson



What Is Machine Learning (ML)?



CC-BY-ND Image Courtesy of daapw110



CC-BY-ND Image Courtesy of ra41

What Is Machine Learning (ML)?

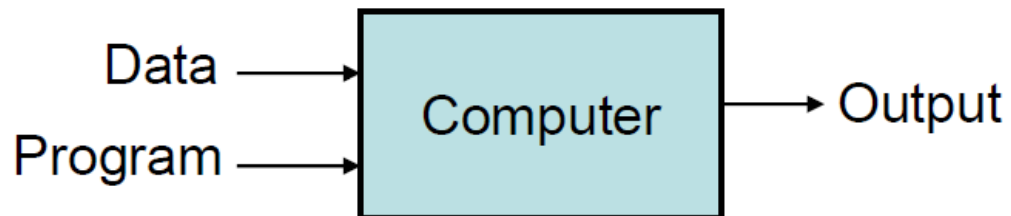
Automating automation

Computer programs can automatically follow rules
How do we determine these rules automatically?

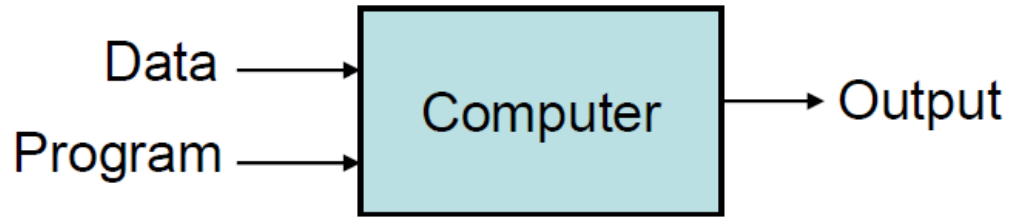
ML focuses on getting computers to program themselves

Let the data do the work
Automatically generate programs that create
useful outputs from data

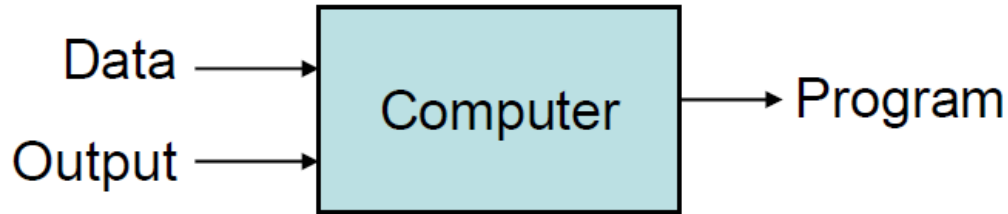
Traditional Programming



Traditional Programming



Machine Learning



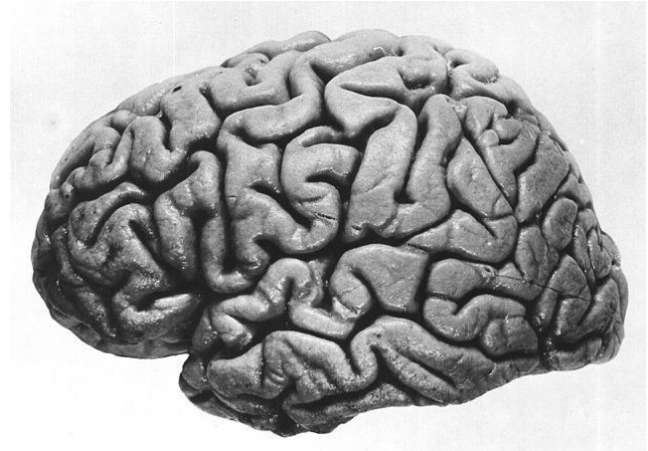
How Do People Learn Things?

Memorization

Accumulation of individual facts

Limited by

Time to observe and memory to store the facts



How Do People Learn Things?

Generalization (what machine learning uses)

Deduce new facts from old ones



CC-BY-ND Image Courtesy of
Turnstone Furniture



CC-BY Image Courtesy of _dChris



CC-BY Image Courtesy of Wrote

How Do People Learn Things?

Generalization (what machine learning uses)

Deduce new facts from old ones



CC-BY-ND Image Courtesy of
Turnstone Furniture



CC-BY Image Courtesy of _dChris



CC-BY Image Courtesy of Paris on Ponce & Le MaisonRouge

How Do People Learn Things?

Generalization (what machine learning uses)

Deduce new facts from old ones



CC-BY-ND Image Courtesy of
Turnstone Furniture



CC-BY Image Courtesy of _dChris



CC-BY Image Courtesy of Paris on Ponce & Le MaisonRouge

Limited by number of facts and accuracy of deductions