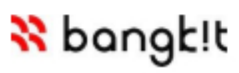




What is ML - Introduction



Welcome

 bangk!t

Meet Your Instructors

Prerequisites

- Basic Python programming
- Basic matrix algebra
- Exposure to statistics and probability

Applied

Put to practical use as opposed to being theoretical

Machine Learning

Machine Learning

Algorithms learning from examples

Example: Home Prices



Example: Home Prices - Traditional Programming

```
price = get_base_price()

if num_bedrooms > 2:
    price = price * 1.2

if lot_size > 7000:
    price = price * 1.1

if waterfront:
    price = price * 1.3

if near_railroad:
    price = price * 0.9
```

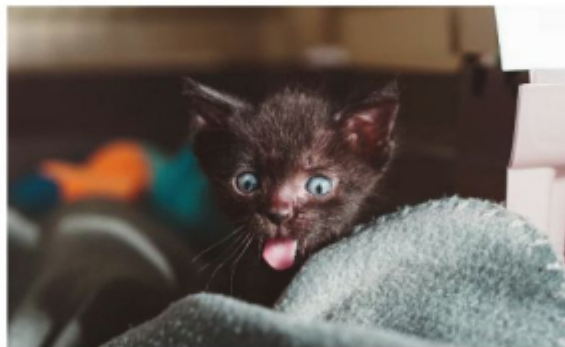
Example: Home Prices - Machine Learning

	A	B	C	D	E
	Latitude	Longitude	Bedrooms	Bathrooms	Year Built
F	47.67551	-122.203362	3	1	1812
F	48.28883	-121.79631	4	5	1912
F	48.33338	-121.77132	2	3	1999
J	49.03551	-121.05694	3	2	2020
J	49.30468	-120.61562	1	3	2002
F	49.34374	-120.4129	2	2	2000
J	50.07676	-119.95079	3	3	1945

Learning from Examples



Learning From Examples



Learning From Examples



Learning From Examples



Learning From Examples



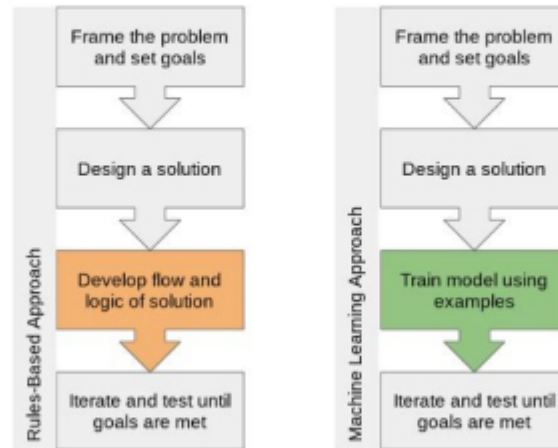
Rules-based

- Humans develop the logic flow
- If/then/else rules
- One-off exceptions
- Limited to human reasoning
- Exposes bias of the implementor

Machine Learning

- Model trained with data
- Emergent patterns in the data
- Experiments and refinements in training and models
- Limited by training data
- Exposes bias of the training data

Product Development Process



Terminology

Artificial Intelligence

Artificial Intelligence

Machines that appear intelligent based on the tasks they perform

Machine Learning

Machine Learning

A specific field of AI where a system learns to find patterns in examples, typically using statistics, in order to make predictions

Deep Learning

Deep Learning

A machine learning approach that breaks a problem down into many pieces, so it can learn more from the training data



Features

Features

Information drawn from examples which distinguish one example from another are the features in a machine learning system

Video recommendation?

Price of a house?

Which ad to display?

Model

Model

a mathematical way the patterns and insights that a machine learning system learns from examples and is used to make predictions

Training

Testing

Overfitting

Overfitting

When a model conforms too much to its training data and cannot generalize to make predictions about new data

