An Introduction to Machine Learning

With Python

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Microsoft
Gold Data Analytics
Gold Data Platform
Gold Cloud Platform

MVP Microsoft® Most Valuable Professional

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*We **enable** our **clients** make **sense** of their **data***

DATA ARCHITECTURE

MANAGED SERVICES

DATA STRATEGY

DATA SCIENCE

DATA MANAGEMENT

DATA ANALYTICS

Questions?

Shout them out!!

Where to find the ***slides*** and ***demos***

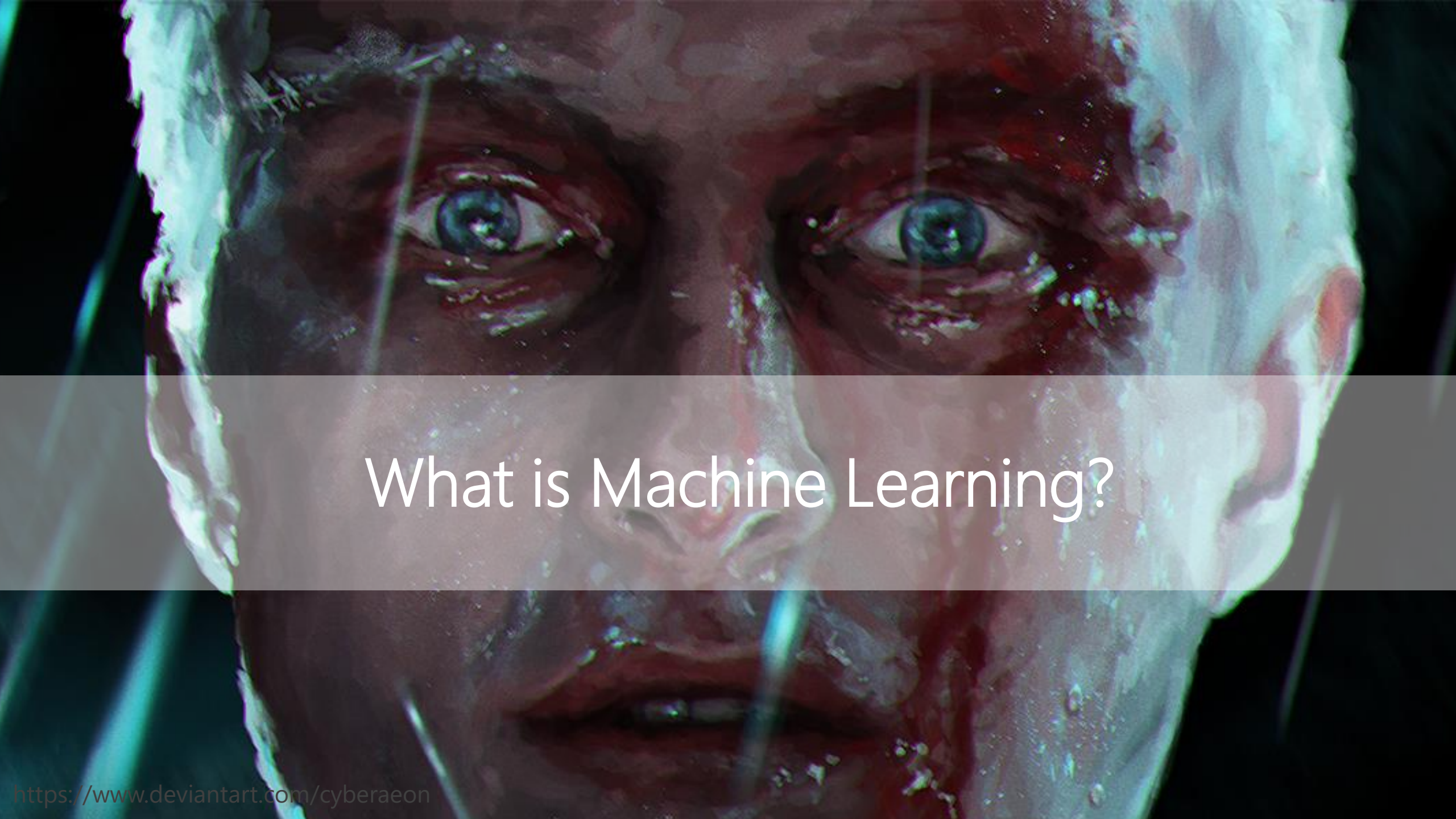
https://github.com/SQLShark

bit.ly/2uHQS74

In this session we will look to understand what is ***Machine Learning***?

We will explore ***data science***, the process, the use cases and how to get started.

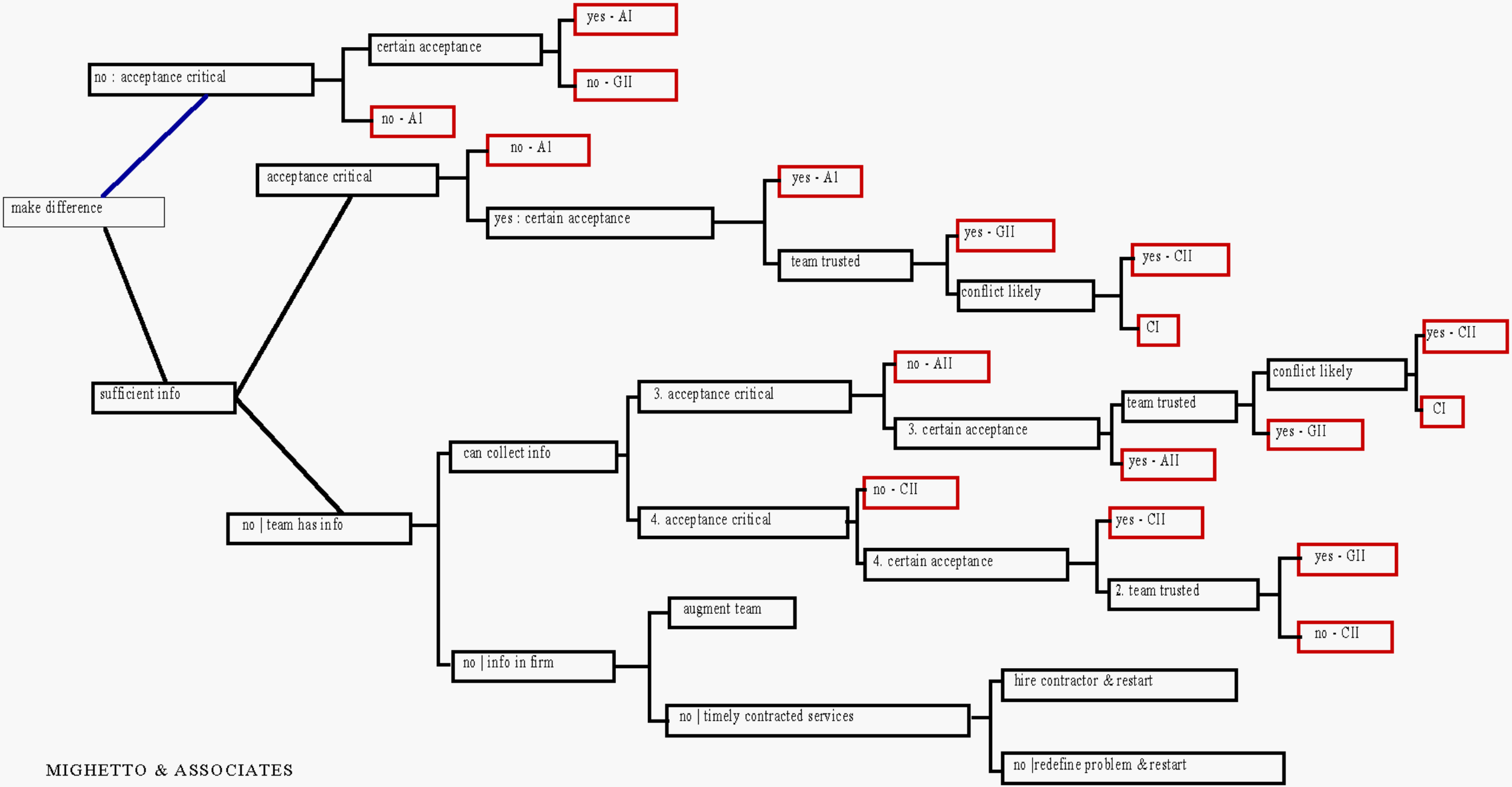
We will understand why ***Python*** is a great Language, and how to advance your skills in machine learning



What is Machine Learning?

https://www.deviantart.com/cyberaeon

Expert systems



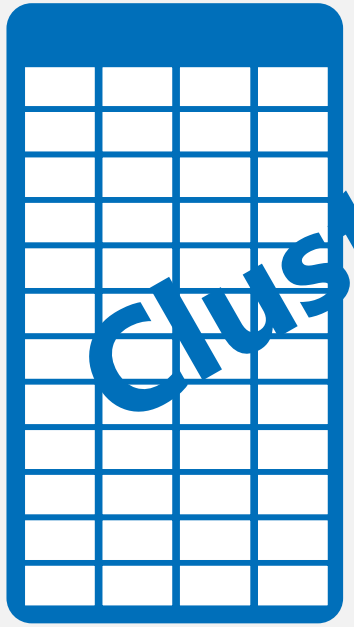
MIGHETTO & ASSOCIATES

A machine is said to learn from experience **E** with respect to some class of tasks **T** and performance measure **P**

Its performance at tasks in **T**, as measured by **P**, improves with experience **E**.

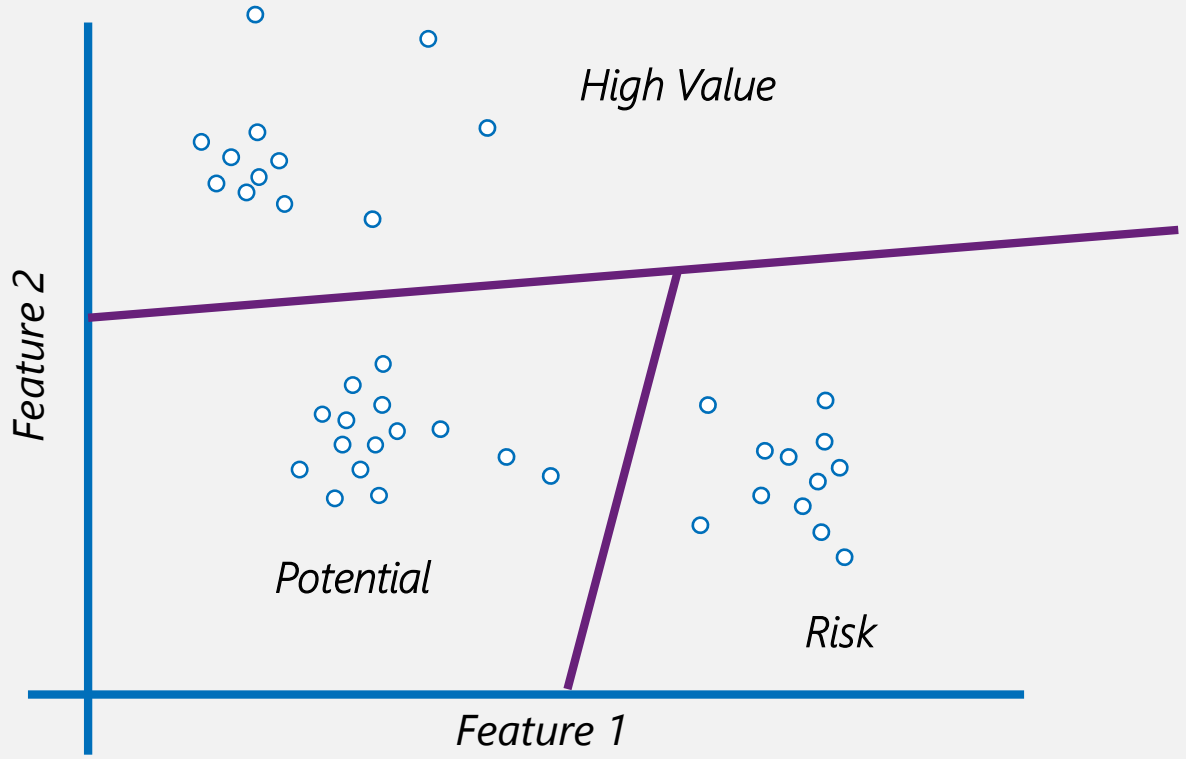
https://www.quora.com/What-is-the-best-definition-for-machine-learning

data

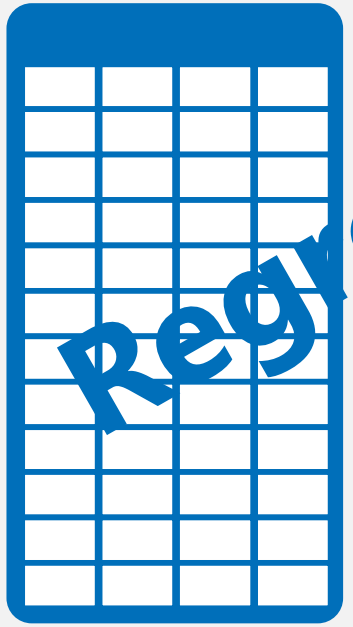


clustering

"Hey, I am trying to better **understand** my customers. I think there might be a **pattern** in their **behaviour**, but I am struggling to see it"

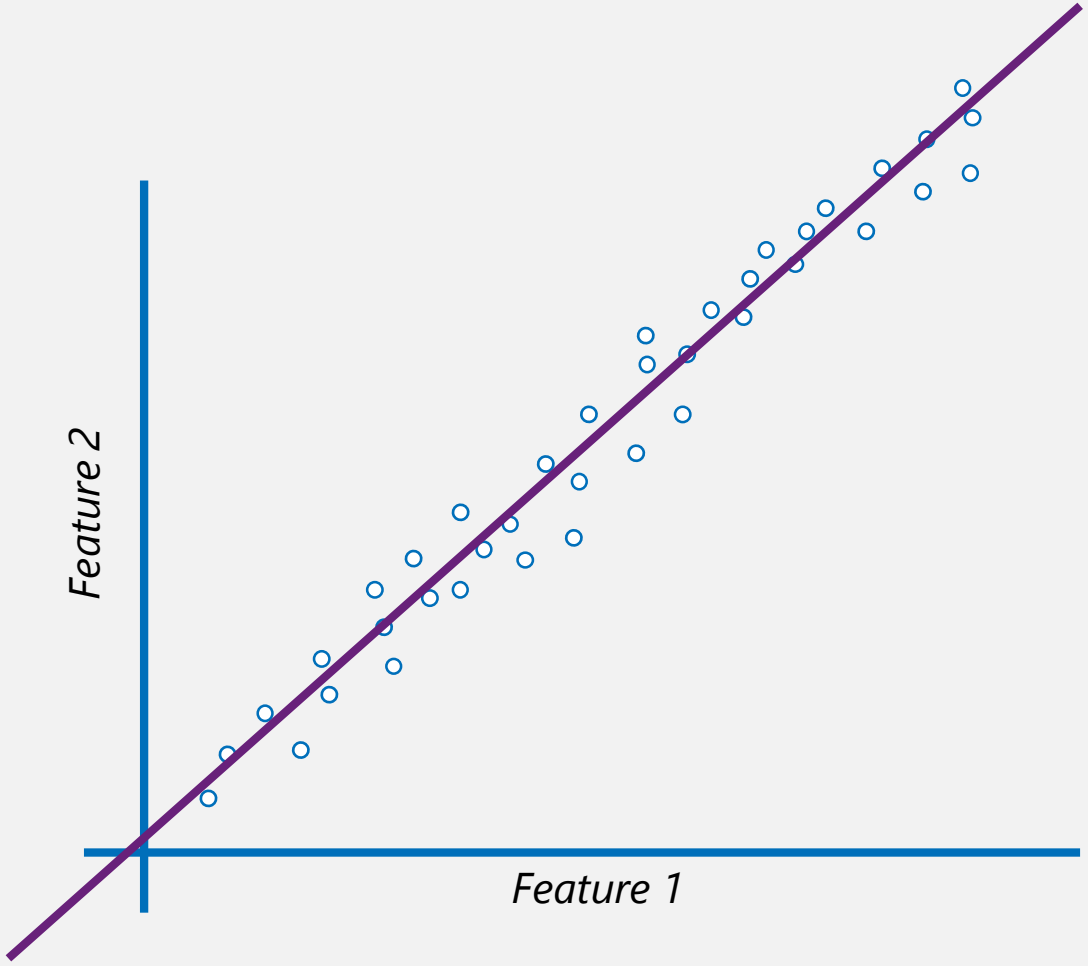


data

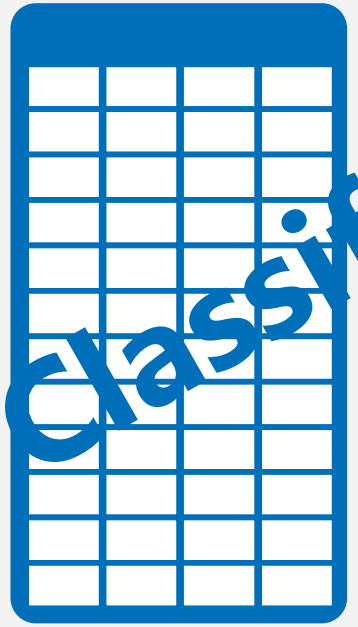


Regression

"Hey, I am trying to **predict** how much someone will **spend** next time they come to my store"

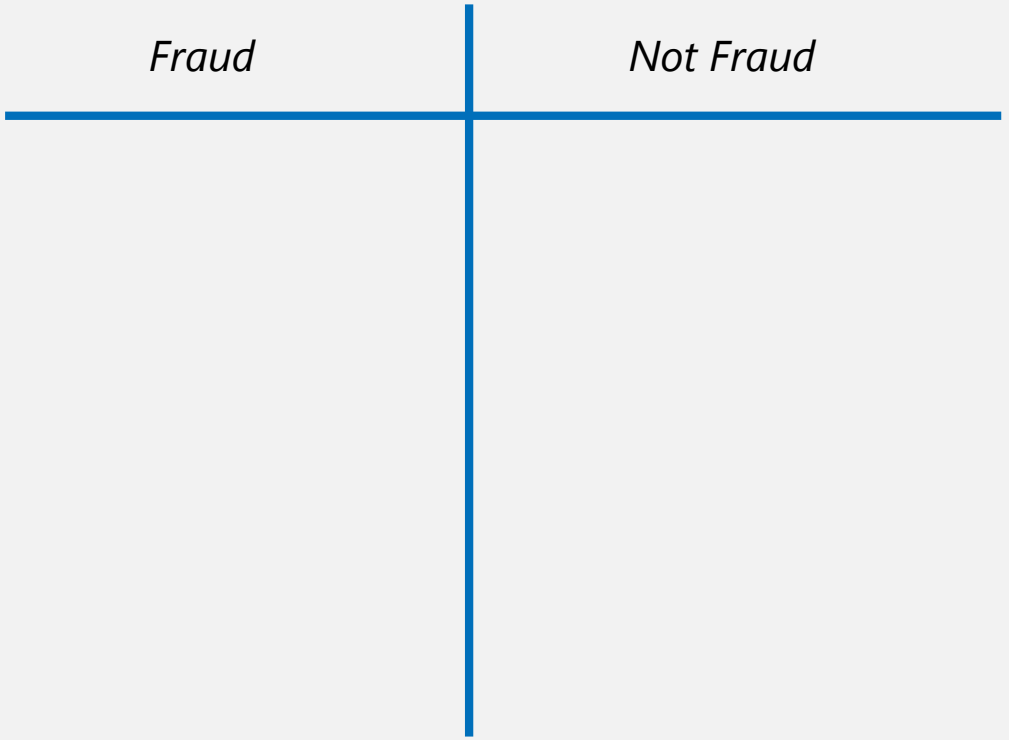


data

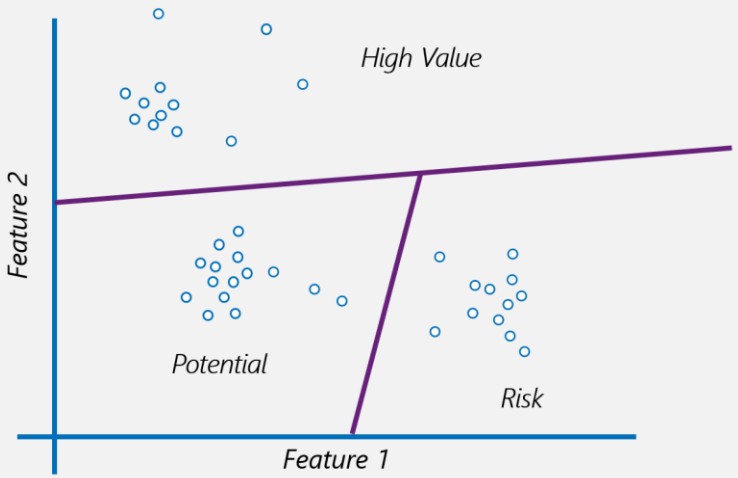


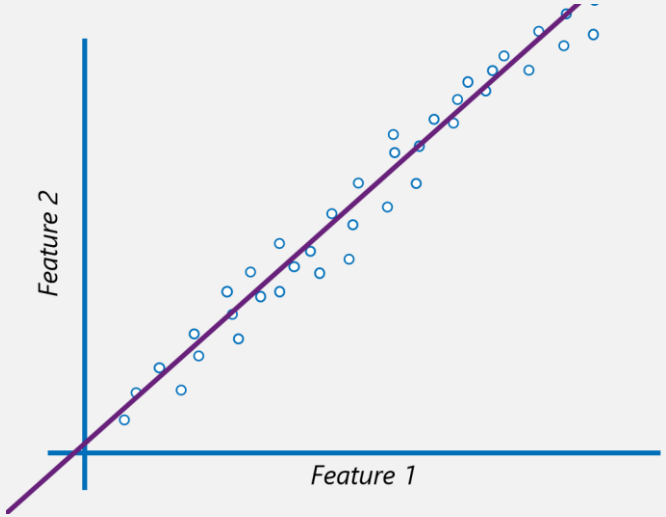
classification

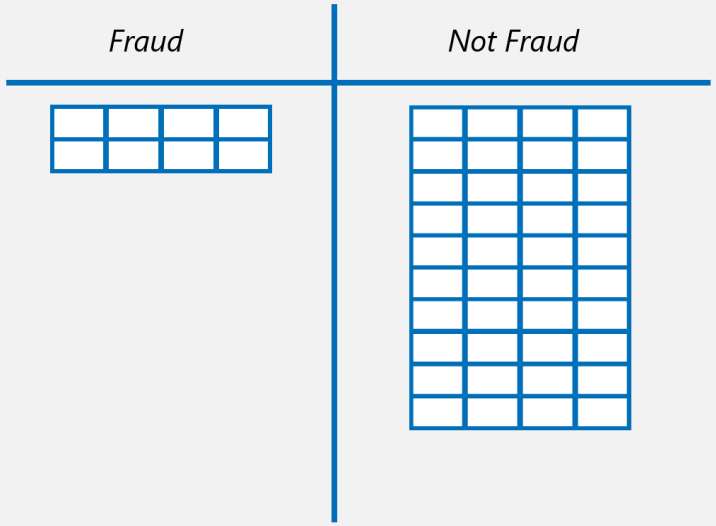
"Hey, I am trying to **predict** if an insurance claim is **fraudulent** or not"



Types of machine learning







Clustering **Regression** **Classification**

Unsupervised

Supervised

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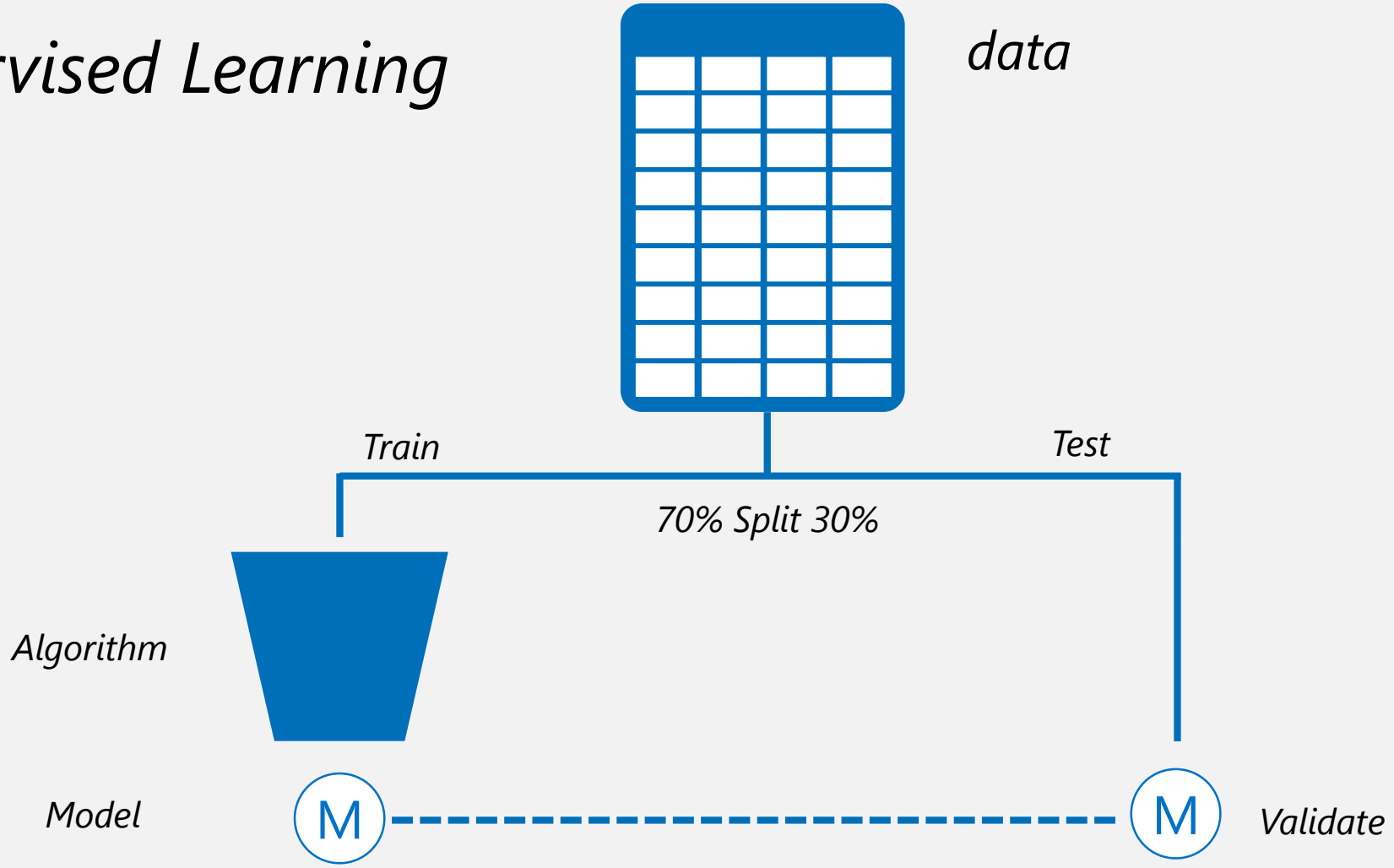
Supervised Learning



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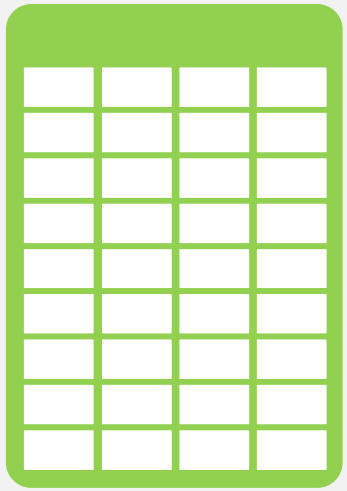
Supervised Learning



New data

Model

Prediction

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R2
D3

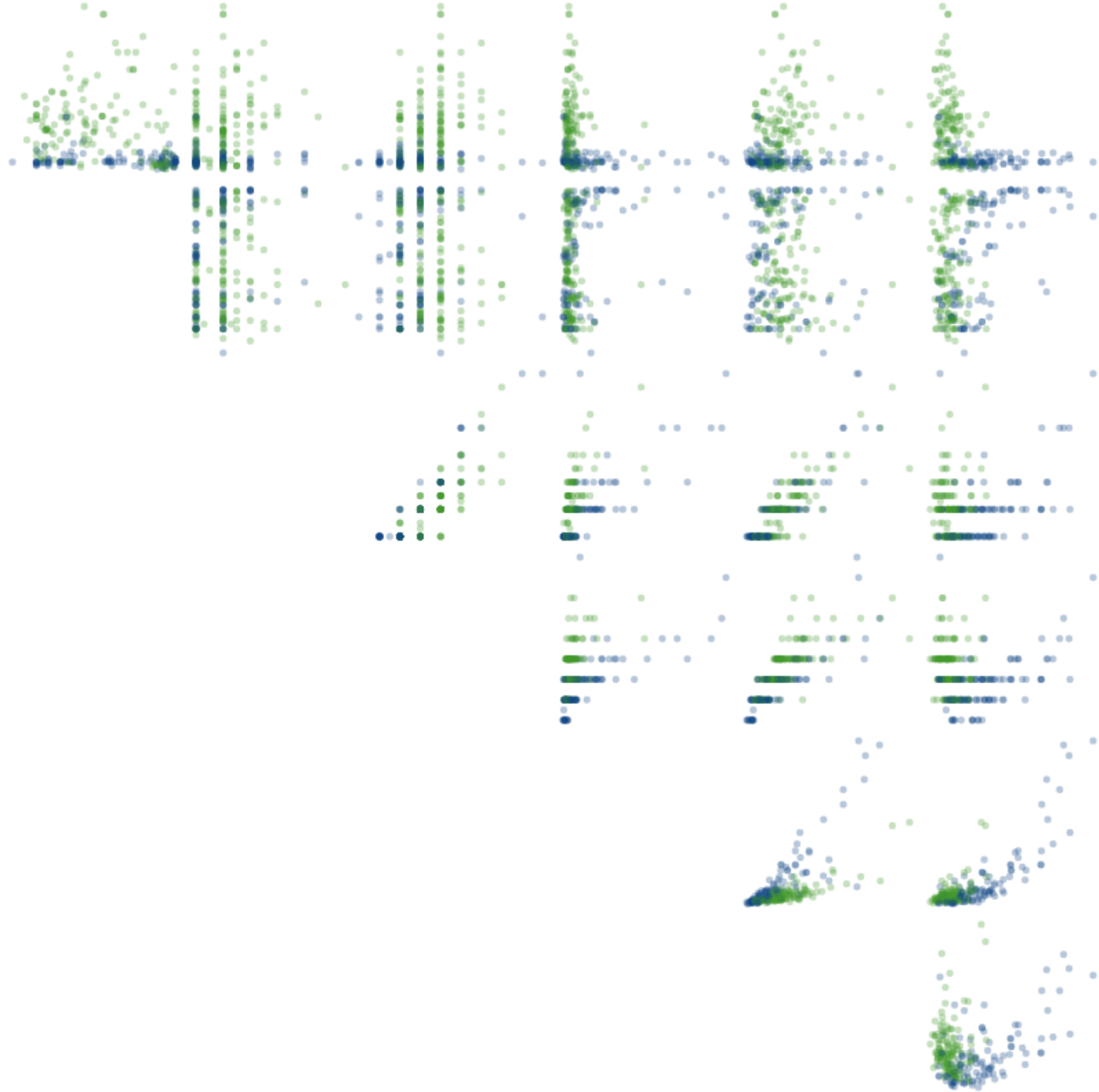
A visual introduction to machine learning

English

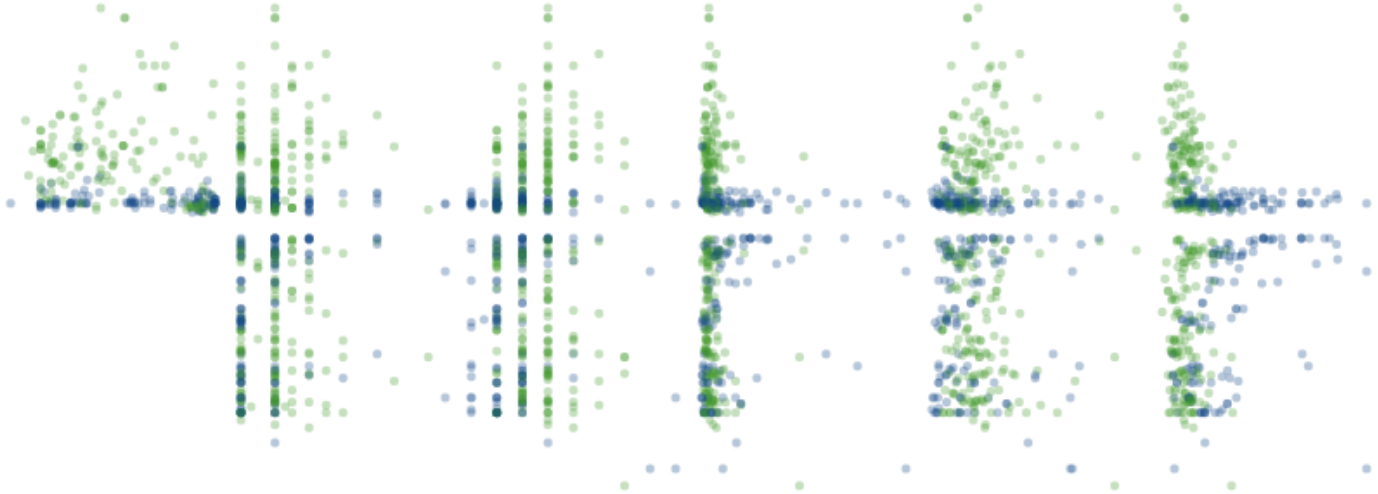
In machine learning, computers apply **statistical learning** techniques to automatically identify patterns in data. These techniques can be used to make highly accurate predictions.

Keep scrolling. Using a data set about homes, we will create a machine learning model to distinguish homes in New York from homes in San Francisco.

SCROLL



R2
D3

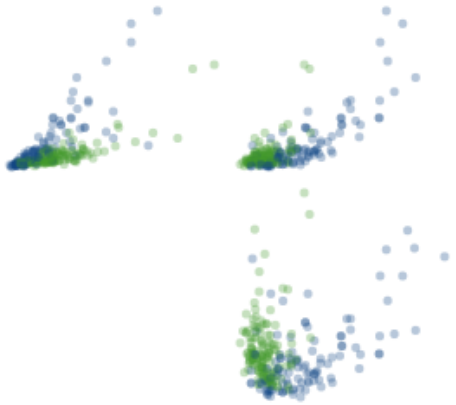


A visual introduction to

http://www.r2d3.us/visual-intro-to-machine-learning-part-1/

Keep scrolling. Using a data set about homes, we will create a machine learning model to distinguish homes in New York from homes in San Francisco.

SCROLL



Python: Fundamentals

```
print("Hello, Manchester!")
```

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Beautiful is better than ugly
Explicit is better than implicit
Simple is better than complex
Complex is better than complicated
Readability counts

The Zen of Python (PEP 20)

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Python is...

An interpreted language

It has a base language which is extended with modules

Indents are important! Indents over curly brackets

Supports: variables, lists, dictionaries and tuples

Duck typed

Awesome!!

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DS/ML Modules

Numpy	– Numerical Python
SciPy	– Scientific Python
Pandas	- Data wrangling
MatPlotLib	- Data Visualisation
Scikit-learn	- Machine Learning (shallow)
….	
TensorFlow	- Machine Learning (deep)
Keras	- High level DL
NLTK	- Natural Language processing

How to add modules? **PIP**

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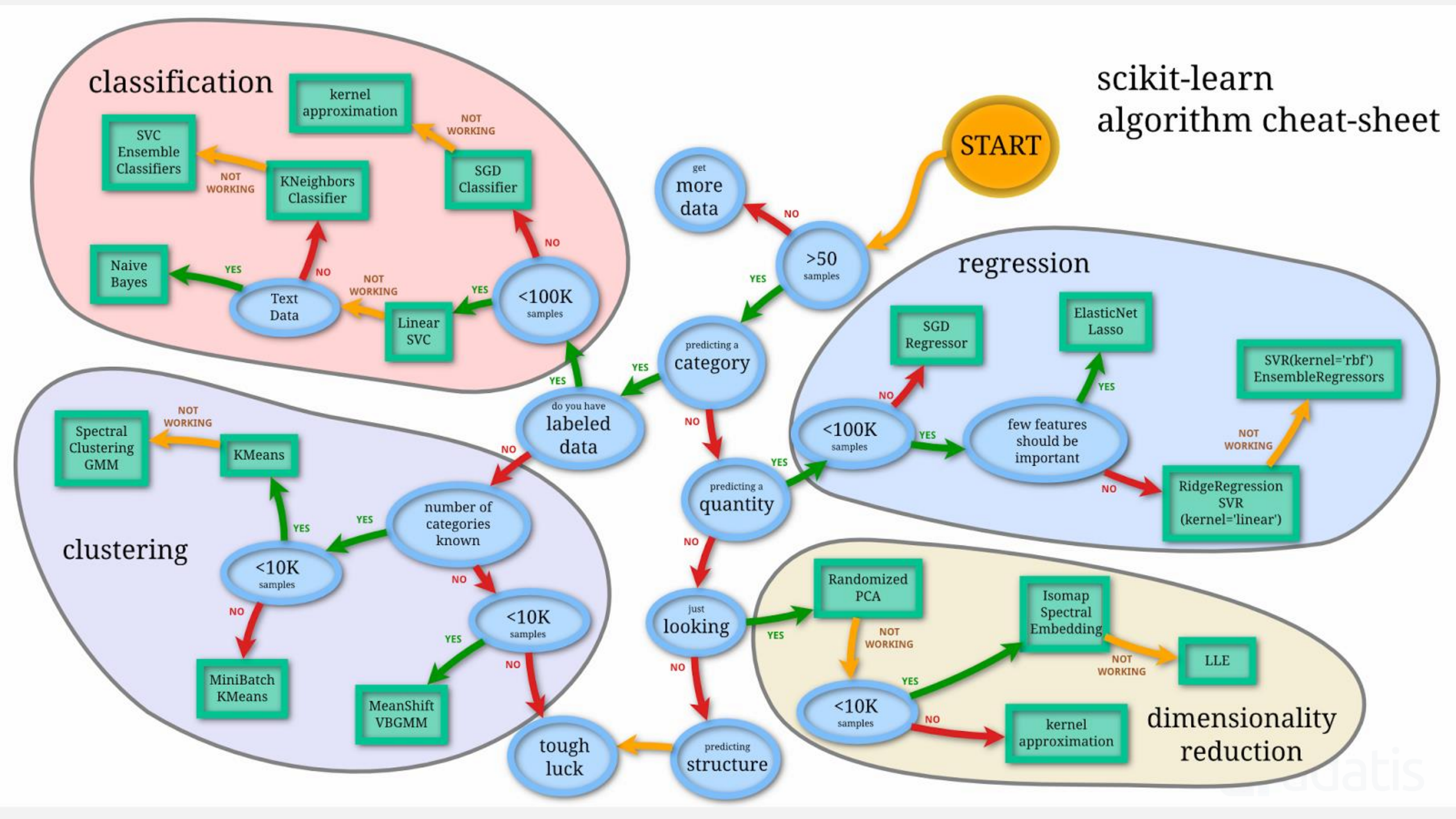
scikit-learn
algorithm cheat-sheet
START
get more data
NO
>50 samples
YES
predicting a category
YES
do you have labeled data
YES
<100K samples
NO
Naive Bayes
YES
Text Data
NO
KNeighbors Classifier
NO
SVC Ensemble Classifiers
NOT WORKING
kernel approximation
NOT WORKING
SGD Classifier
NOT WORKING
Linear SVC
NO
predicting a quantity
YES
<100K samples
NO
SGD Regressor
YES
few features should be important
YES
ElasticNet Lasso
NO
RidgeRegression SVR (kernel='linear')
NOT WORKING
SVR(kernel='rbf') EnsembleRegressors
NO
just looking
YES
Randomized PCA
NOT WORKING
Isomap Spectral Embedding
NOT WORKING
LLE
YES
<10K samples
NO
kernel approximation
NO
predicting structure
tough luck
NO
number of categories known
YES
<10K samples
NO
KMeans
NOT WORKING
Spectral Clustering GMM
YES
<10K samples
NO
MiniBatch KMeans
NO
<10K samples
YES
MeanShift VBGMM
NO
classification
clustering
regression
dimensionality reduction

Python: Demos

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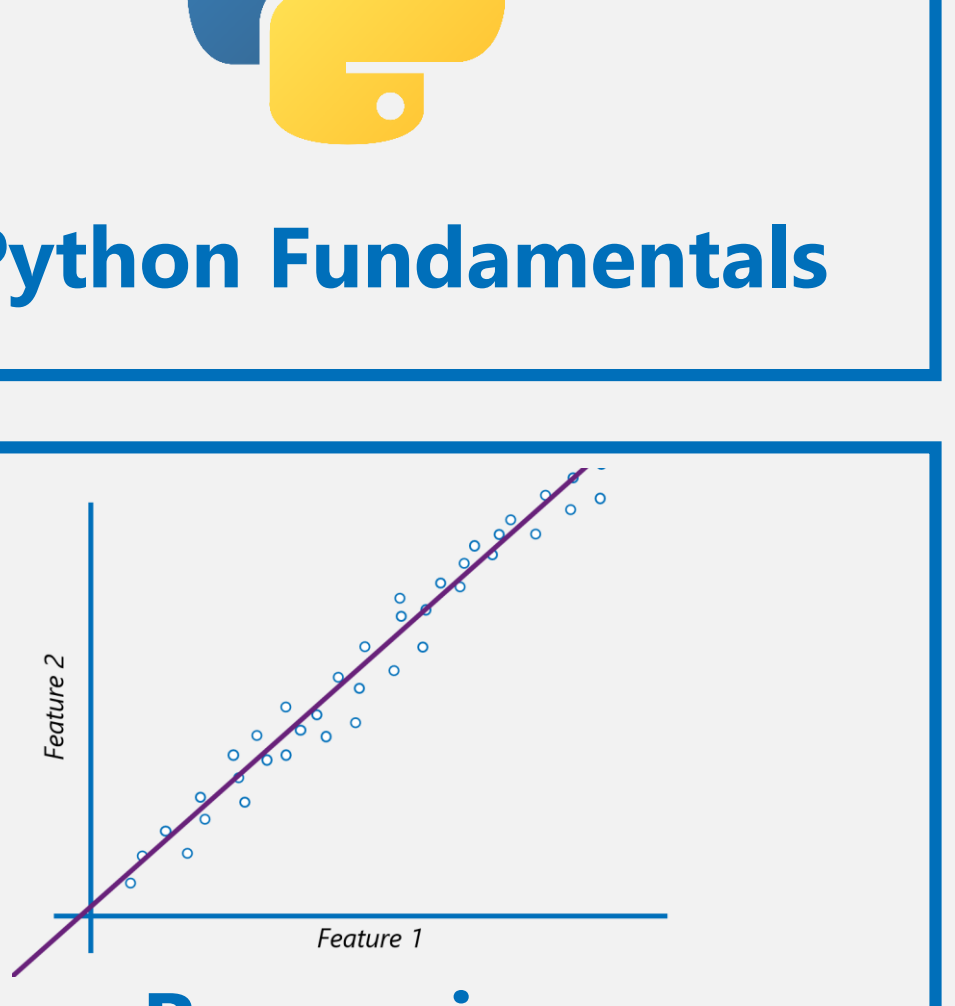
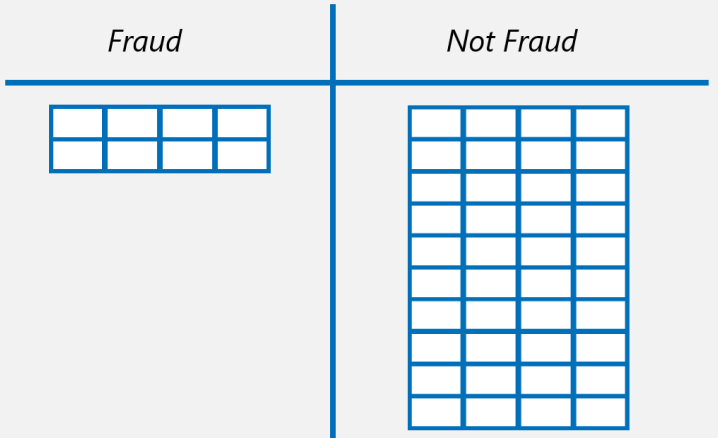
Python Fundamentals

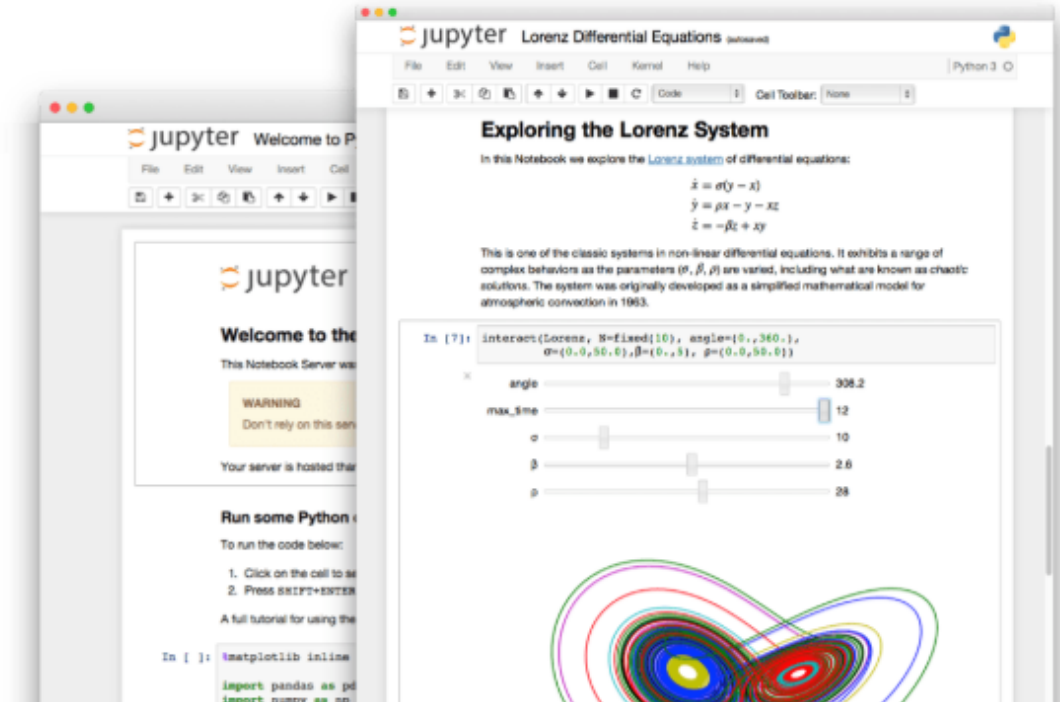


Clustering

Regression

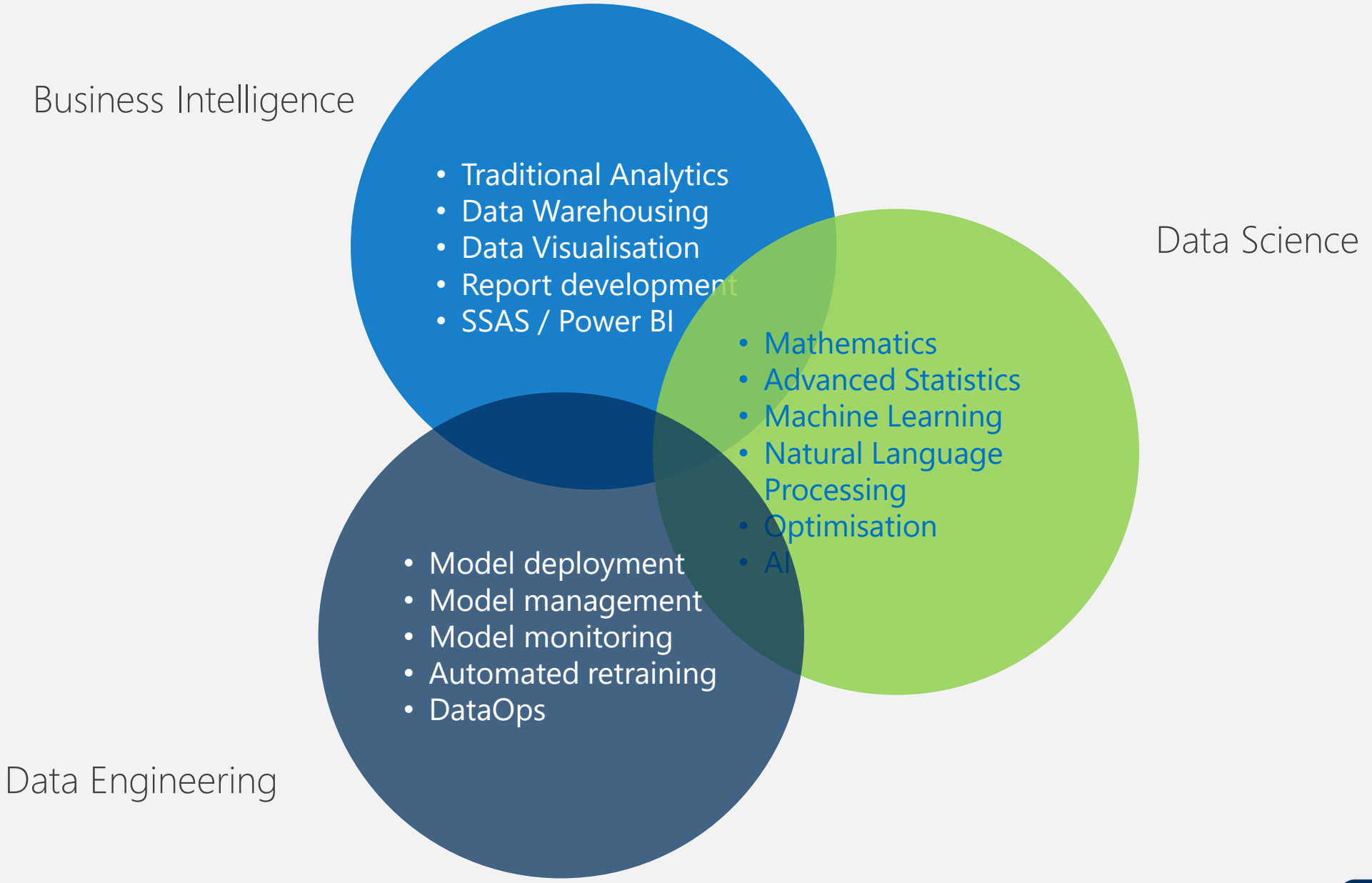


Classification



The Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.


Business Intelligence
• Traditional Analytics
• Data Warehousing
• Data Visualisation
• Report development
• SSAS / Power BI
Data Science
• Mathematics
• Advanced Statistics
• Machine Learning
• Natural Language Processing
• Optimisation
• AI
• Model deployment
• Model management
• Model monitoring
• Automated retraining
• DataOps
Data Engineering

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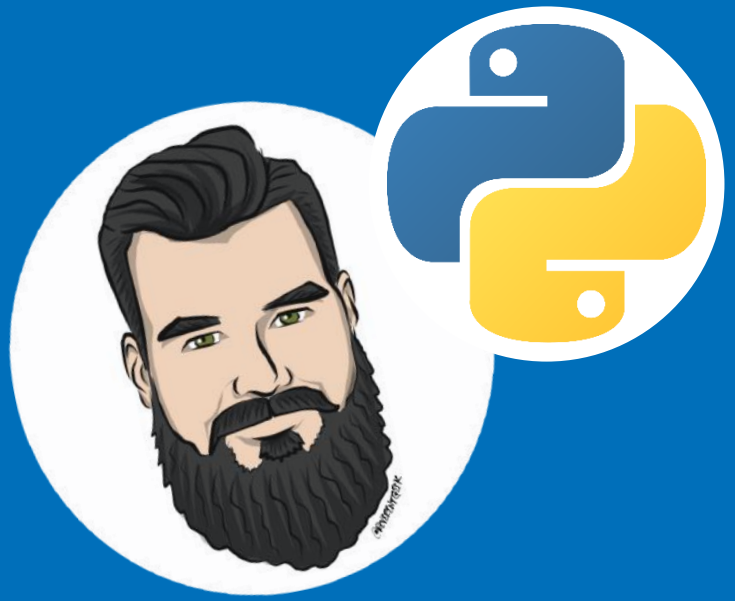
Python!

Python is amazing, so versatile.

If you are serious about Machine Learning then learn Python. Learn R too, but Python for production.

Start basic and build from there.

Thank you



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