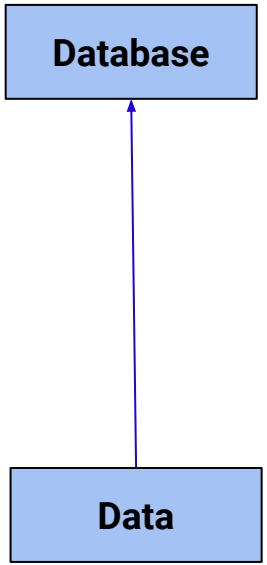
Weekly project

- Build a movie recommender!
- Store movie recommendation data in a db
- Perform unsupervised learning on the data
- Pick from memory-based or neighborhood-based UL
- Recommend films to your users!
- Wrap the application in a web-framework
- Engineer the product using DevOps techniques

SPICED

Weekly project



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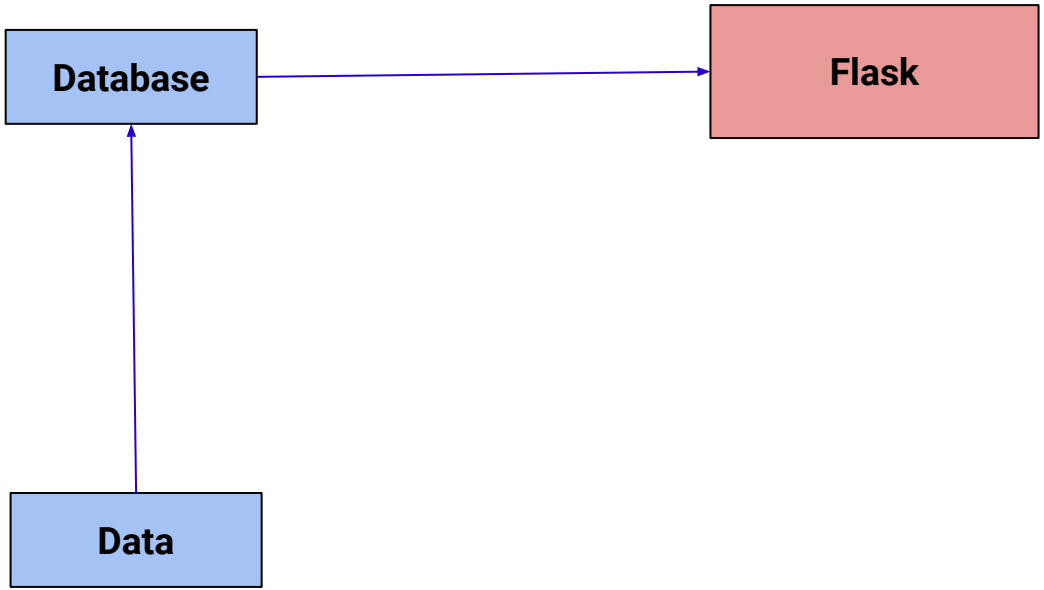

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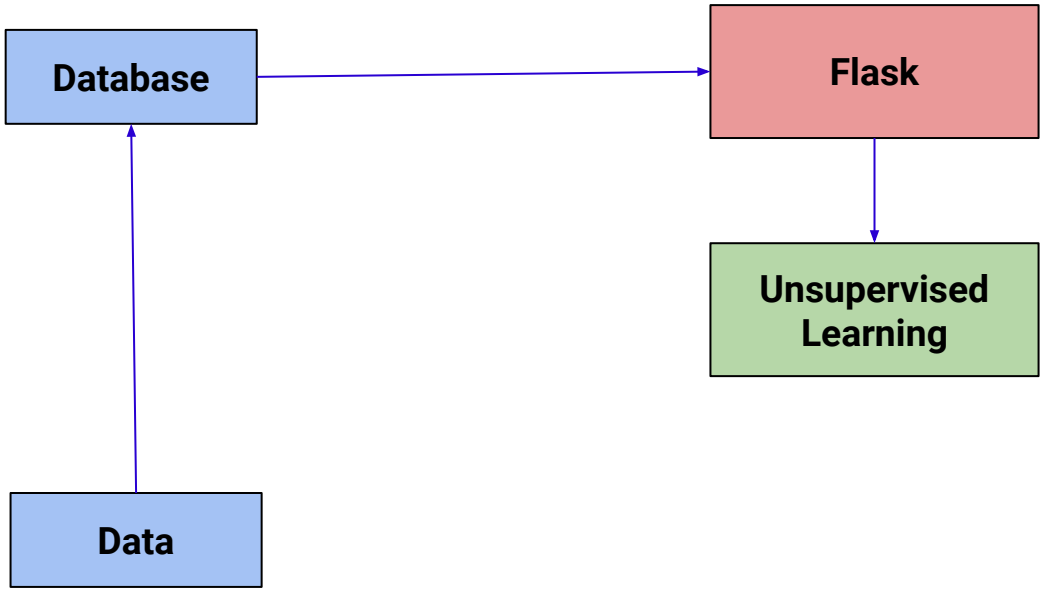

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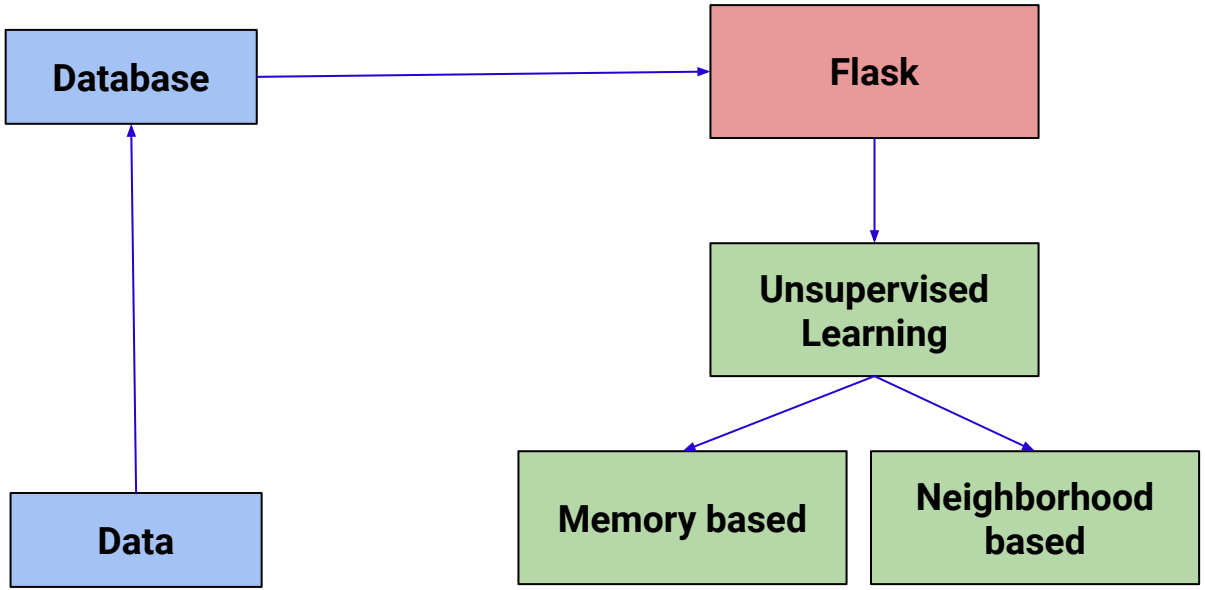

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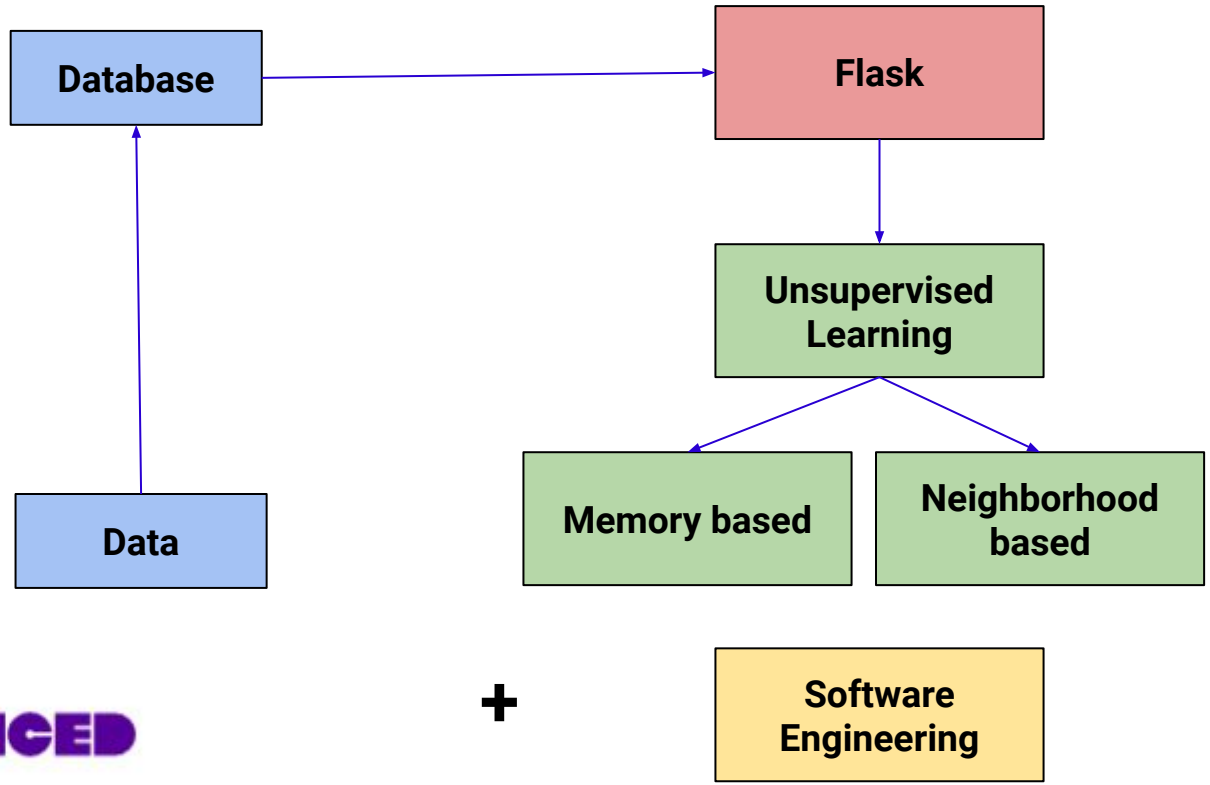

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Unsupervised Learning

"If intelligence is a cake, ***the bulk of the cake is unsupervised learning****, the icing on the cake is supervised learning, and the cherry on the cake is reinforcement learning (RL)"* ***- Yann LeCun, Facebook AI Chief***

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Unsupervised Learning

"If intelligence is a cake, ***the bulk of the cake is unsupervised learning****, the icing on the cake is supervised learning, and the cherry on the cake is reinforcement learning (RL)"* ***- Yann LeCun, Facebook AI Chief***

We still don't know how to make the cake!!

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Unsupervised Learning

- **USE CASES**

Recommendation engines - there’s no category but that which we invent!

Customer segmentation - cohort analysis, but not about the Spearmints!

Anomaly detection - is it fraud? Not when its my bank card!

…..

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Why Unsupervised Learning?

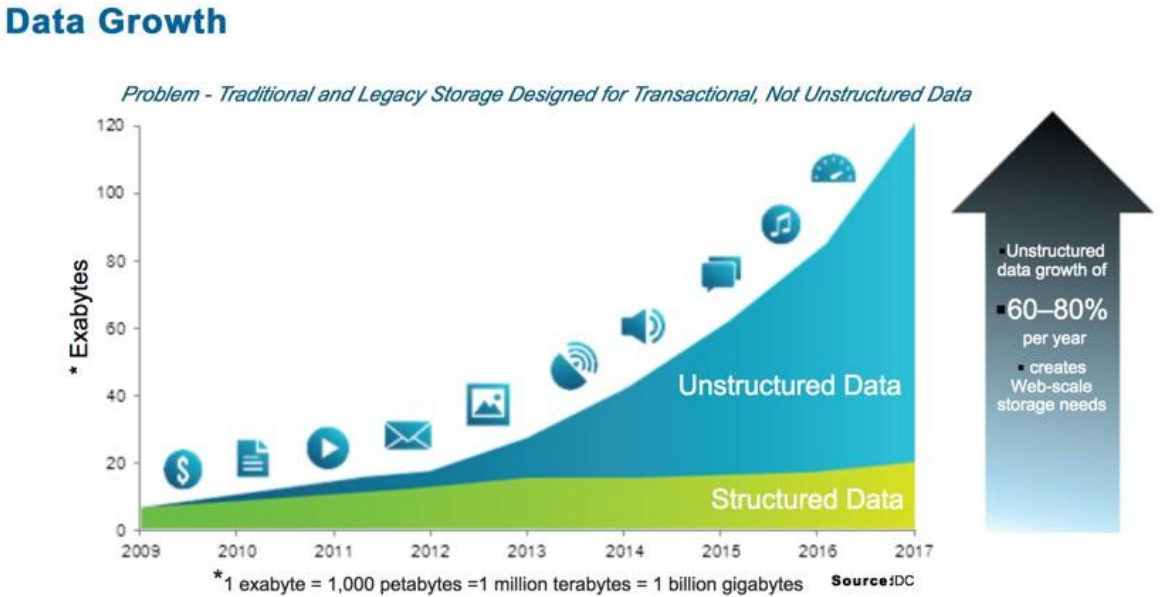
- **WHY?**

Human labelling is expensive, the majority of data is unlabelled

Labelling injects human knowledge and biases

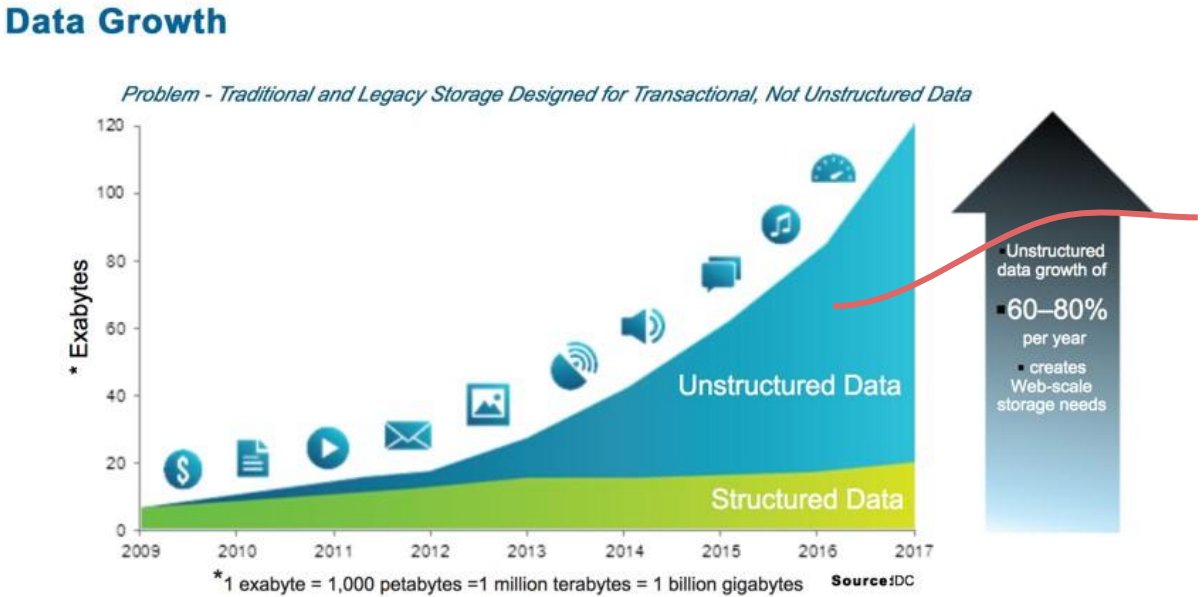
Unsupervised generates new features for ML models to optimise on

Why Unsupervised Learning?



https://www.ibm.com/blogs/ibm-training/when-data-science-met-machine-learning/

Why Unsupervised Learning?



Unstructured data is everywhere, and its unlabelled, and we need to make sense of it!

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https://www.ibm.com/blogs/ibm-training/when-data-science-met-machine-learning/

What is Unsupervised Learning?

- **3 types**

Find patterns in data without labels - **CLUSTERING**

Find essential characteristics about data without labels - **DIMENSIONALITY REDUCTION**

Predict missing data using only other data **- SELF-SUPERVISED** ***(out of scope)***

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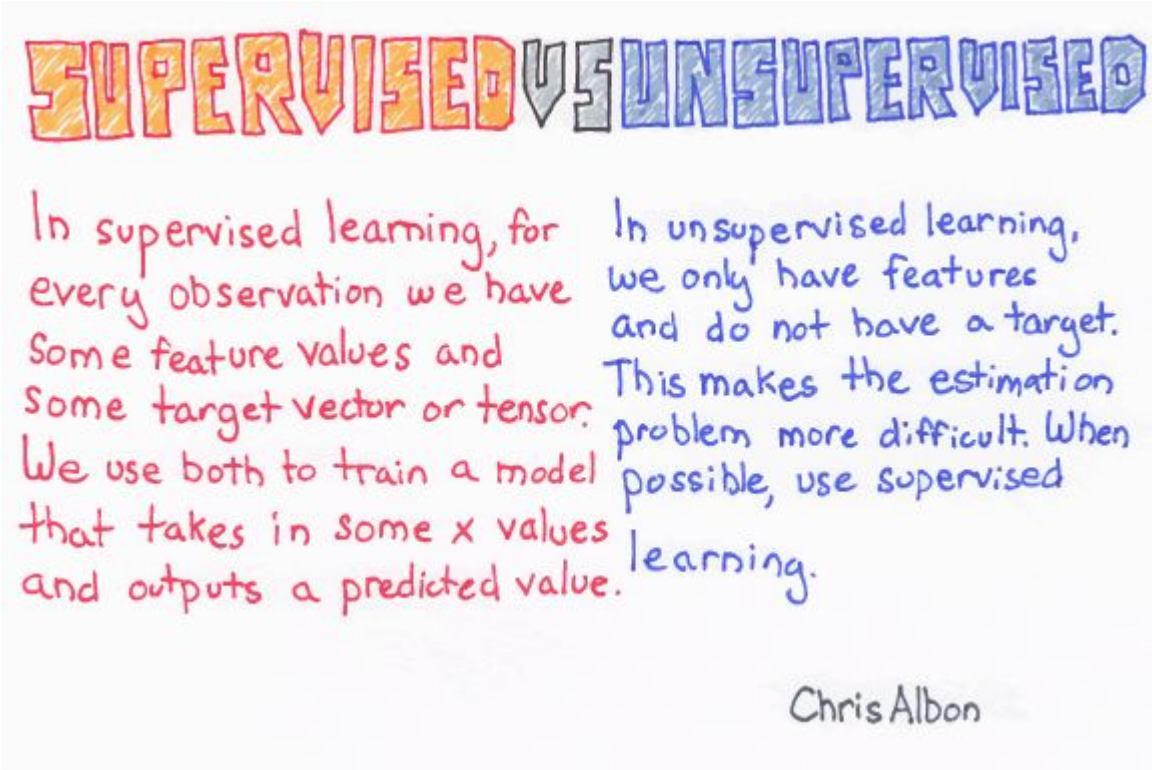
What is Unsupervised Learning?



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How do we do Unsupervised Learning?

- **HOW?**

Distance - Euclidean / Manhattan

Angle - Dot Product / Cosine

Variance conservation - Reconstruct data using smaller datasets / Calculate Eigenpairs

Most likely outcome - Expectation maximisation

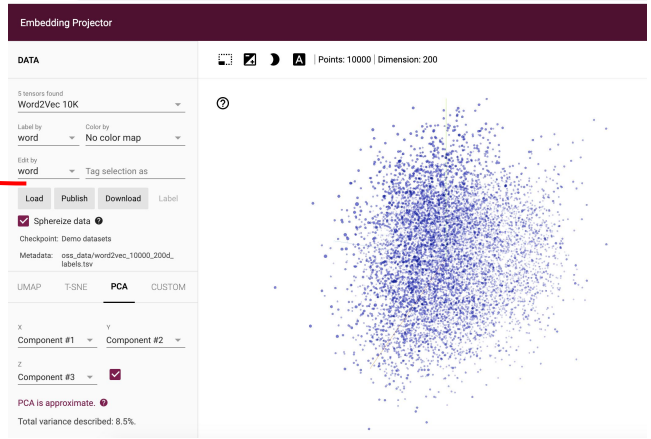
When to do Unsupervised Learning?

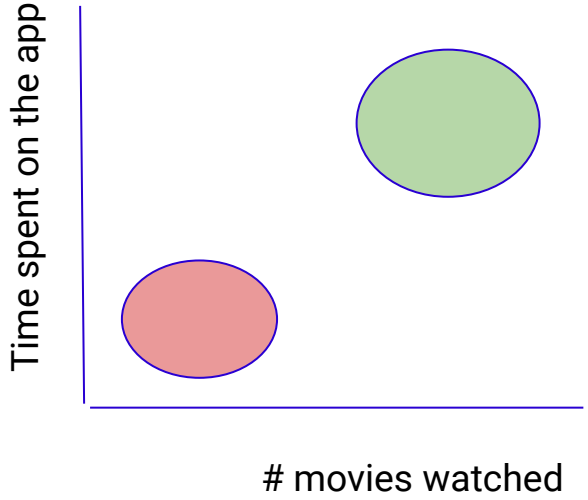
- **WHEN?**

Creating new data

Too many dimensions, look to reduce complexity

Predicting a category without labelled data





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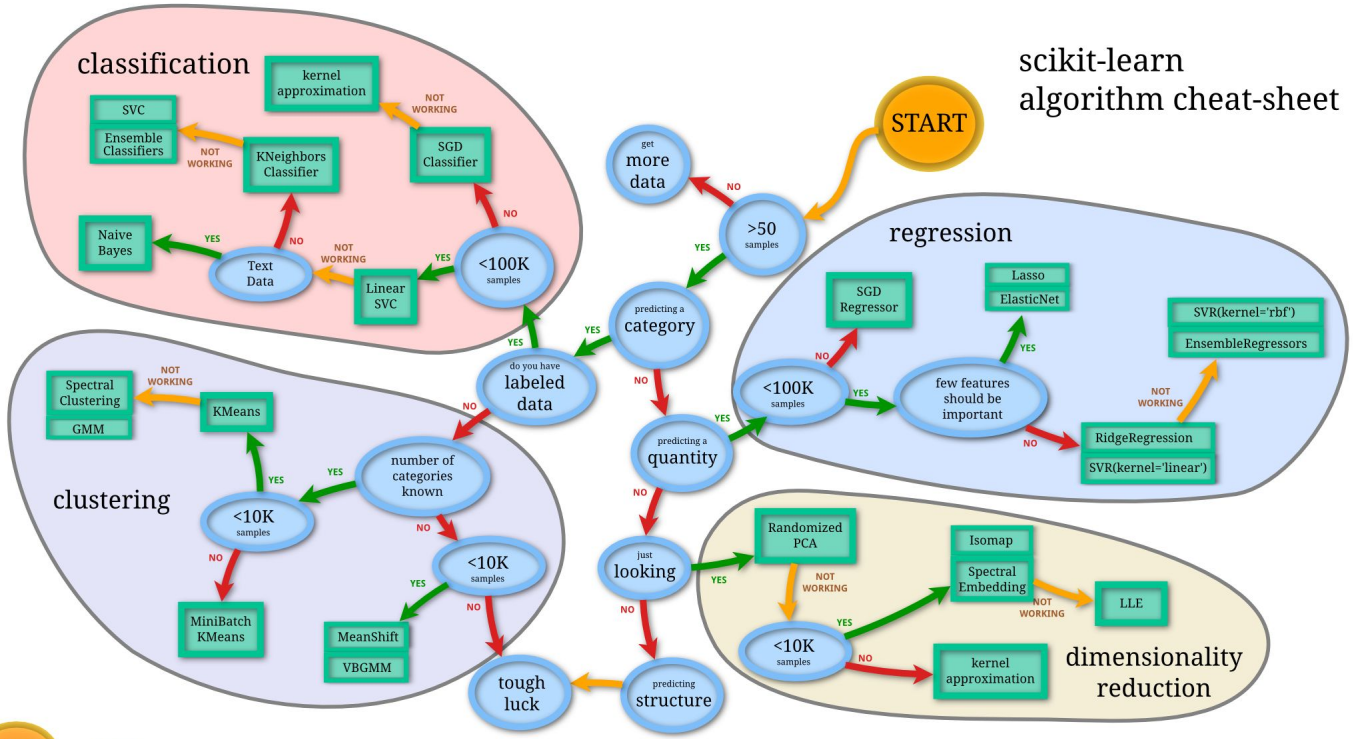
https://projector.tensorflow.org/

Unsupervised Learning Map



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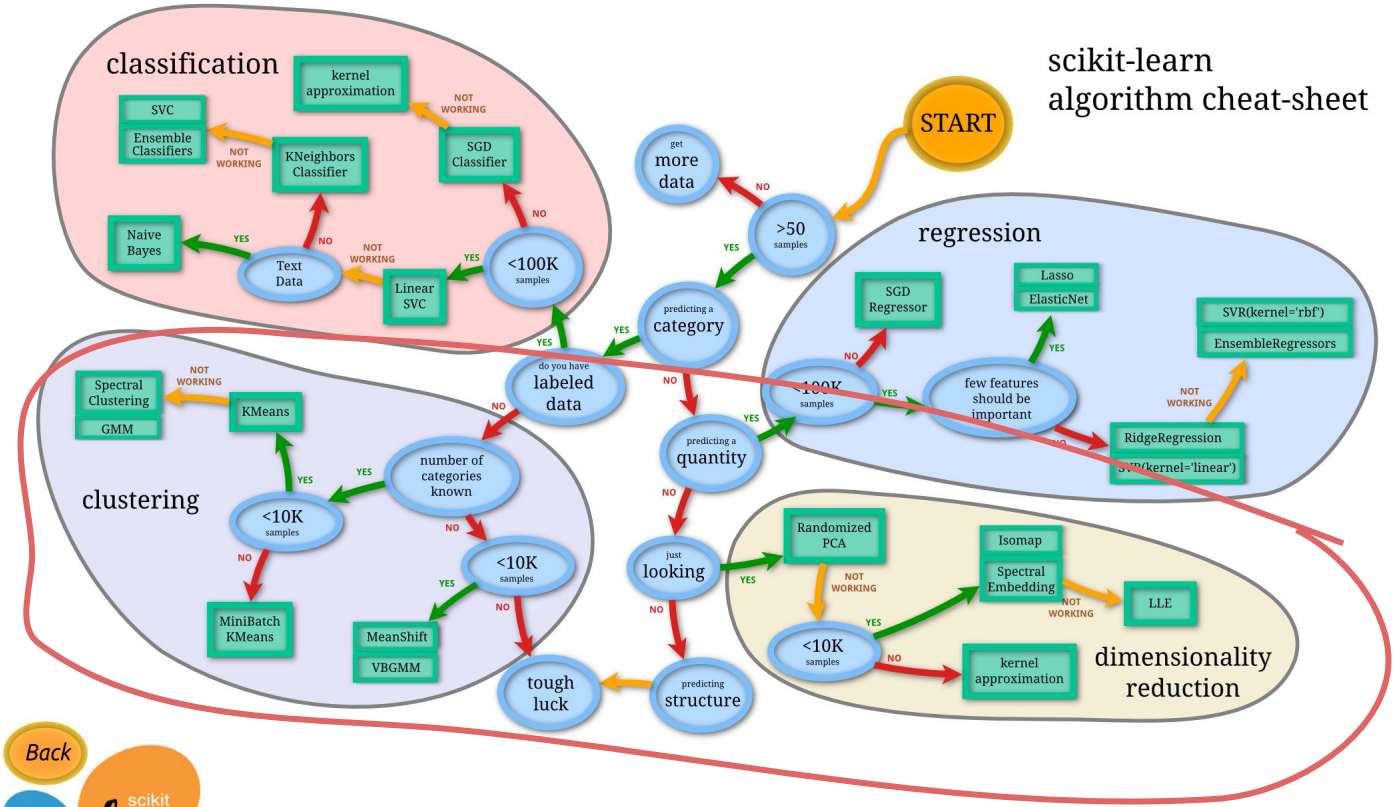
https://scikit-learn.org/stable/tutorial/machine_learning_map/index.html

Unsupervised Learning Map

We are here!



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