A Closer Look at Machine Learning

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Machine learning concepts

- Training data
- Supervised and unsupervised learning
- Classifying machine learning problems and algorithms
- Training a model
- Testing a model
- Using a model

Terminology

Training Data

The prepared data used to create a model

Creating a model is called *training* a model

Supervised Learning

The value you want to predict is in the training data

The data is *labeled*

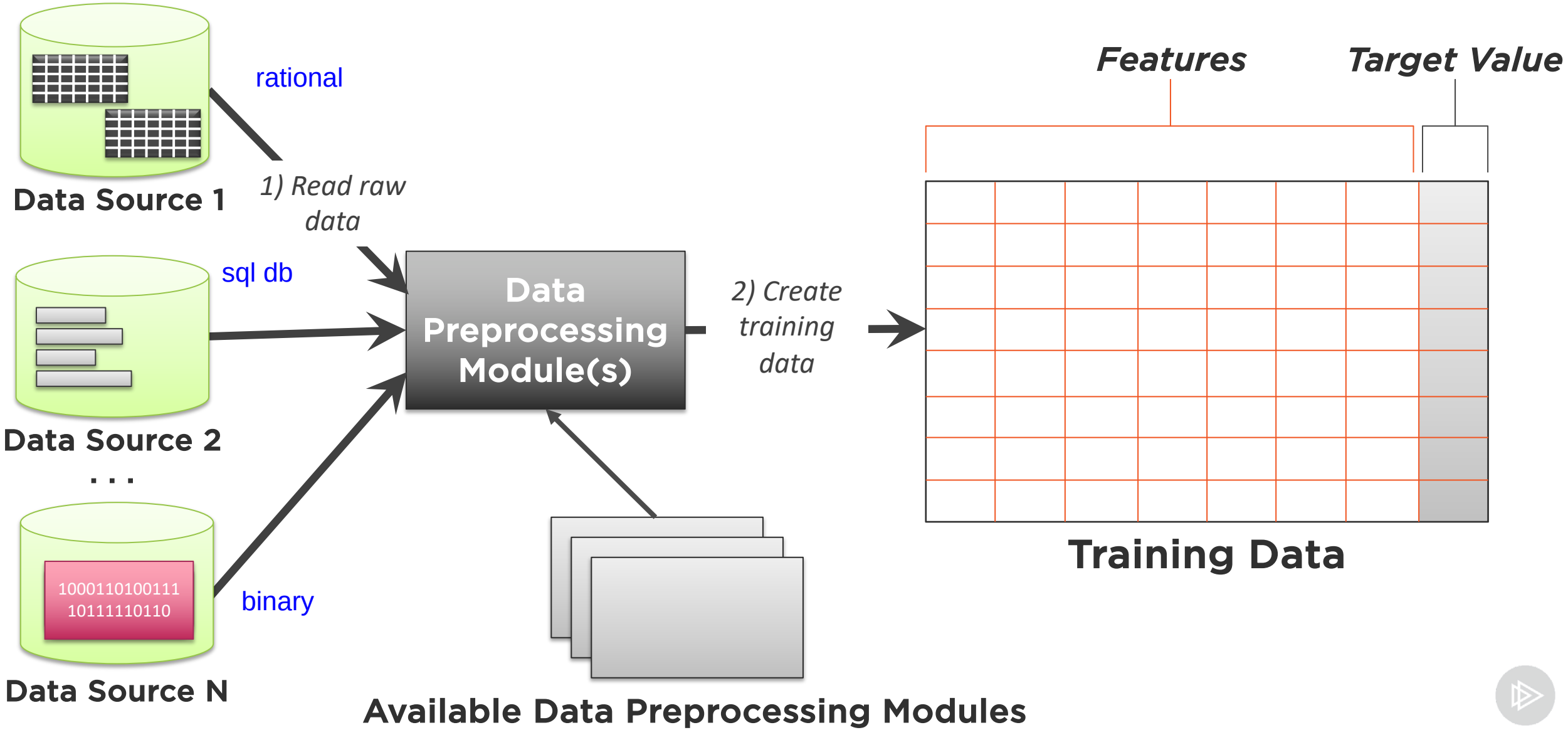
Most common

Unsupervised Learning

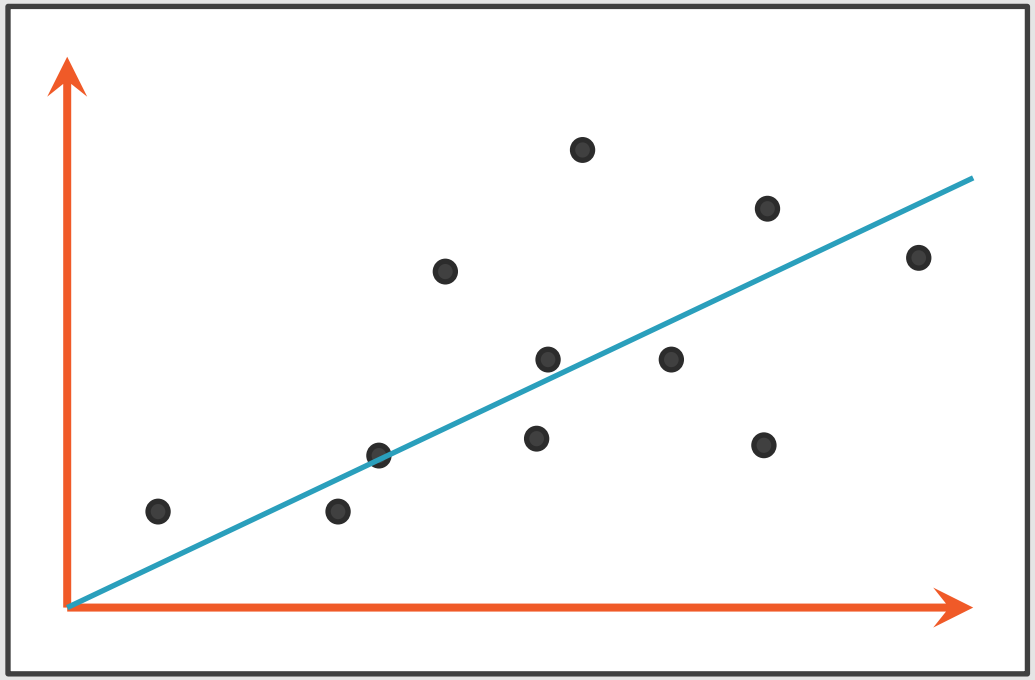
The value you want to predict is not in the training data

The data is *unlabeled*

Data Preprocessing with Supervised Learning



Categorizing Machine Learning Problems: Regression

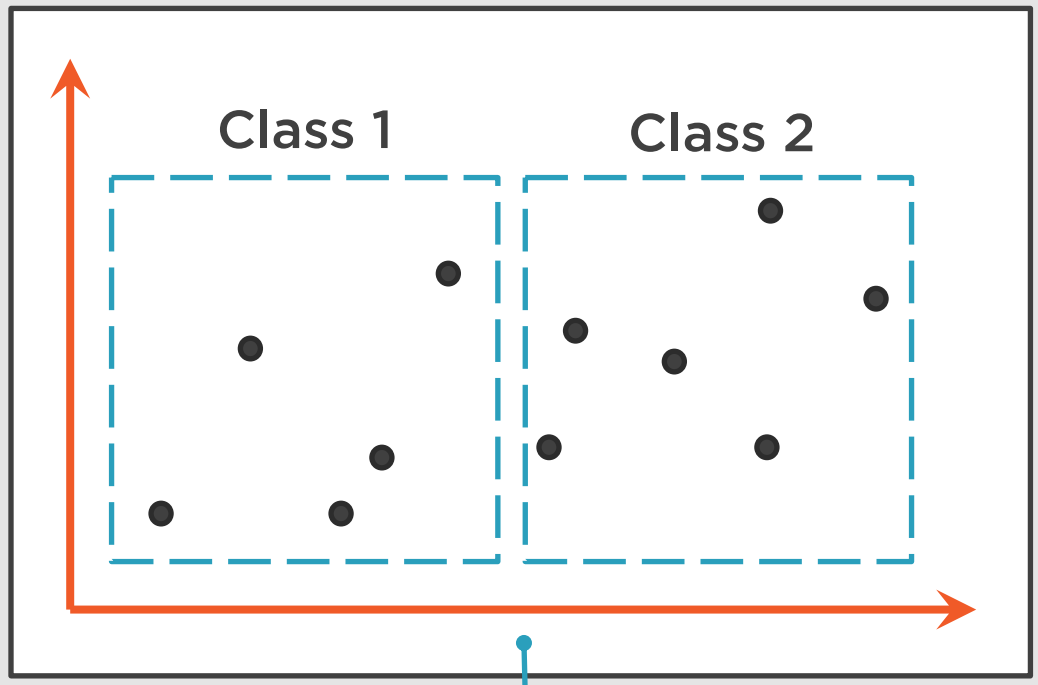


For *supervised* learning

Example question:

- How many units of this product will we sell next month?

Categorizing Machine Learning Problems: Classification

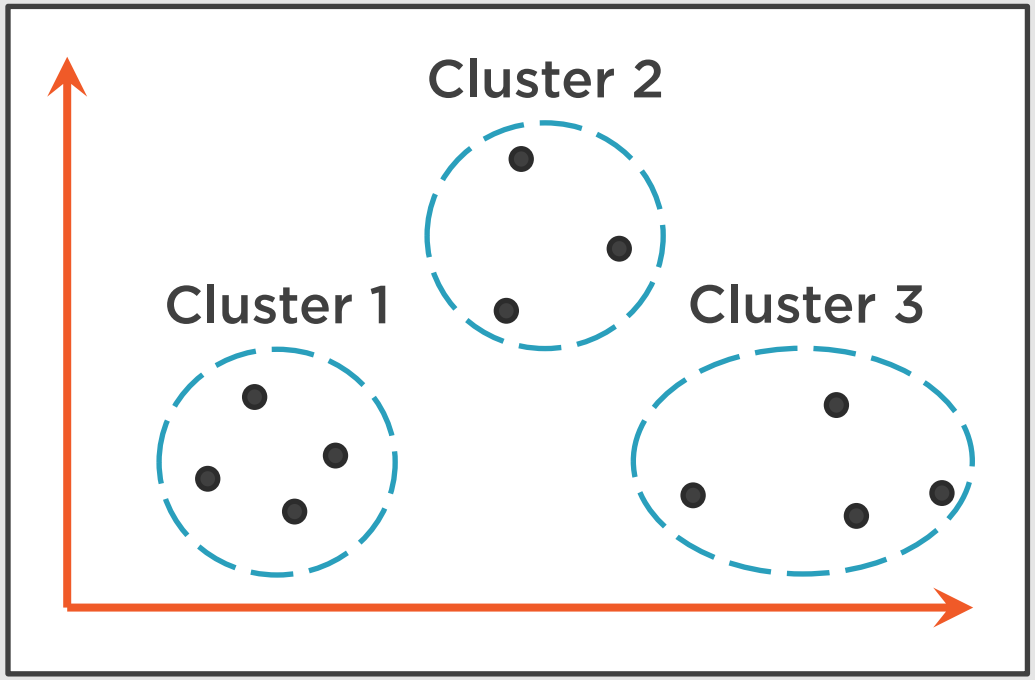


For ***supervised*** learning

Example question:

- Is this credit card transaction fraudulent?

Categorizing Machine Learning Problems: Clustering

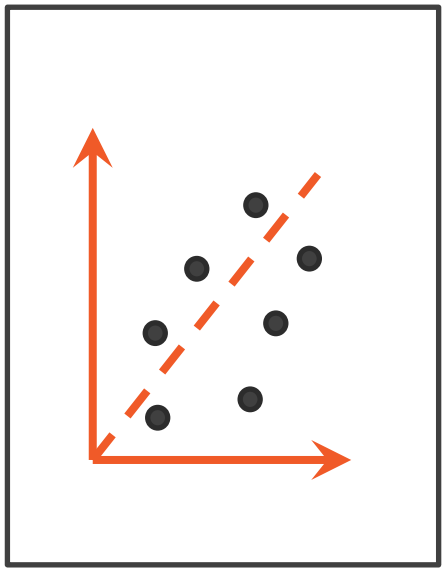


For ***unsupervised*** learning

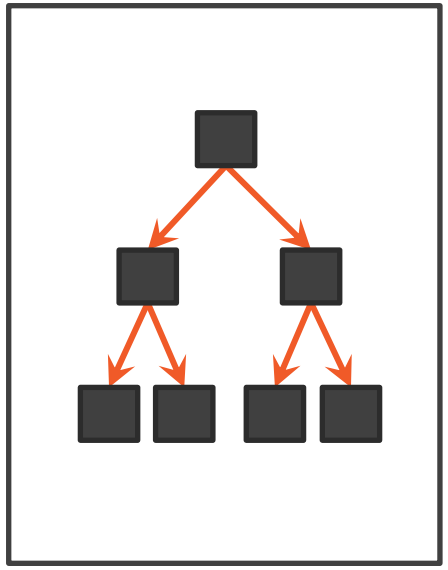
Example question:

- What are our customer segments?

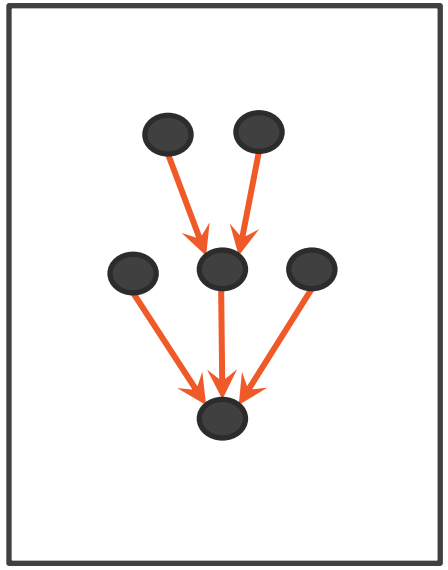
Styles of Machine Learning Algorithms: Examples



Regression

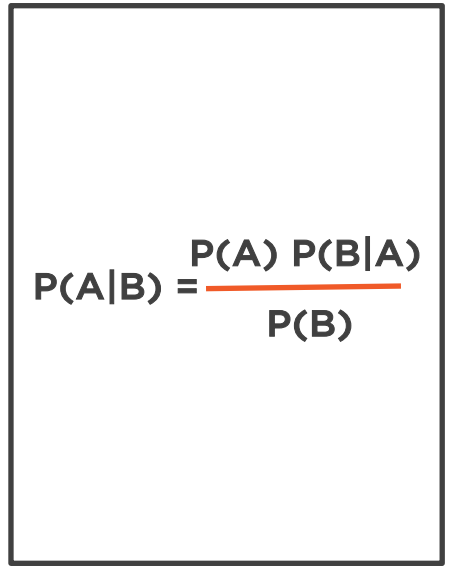


Decision tree

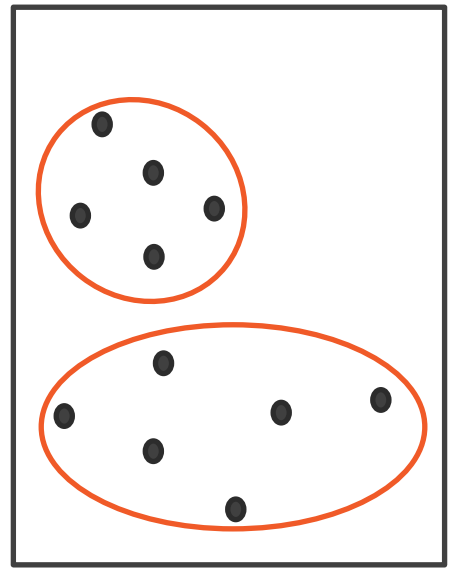


Neural network

Deep learning fits here



Bayesian

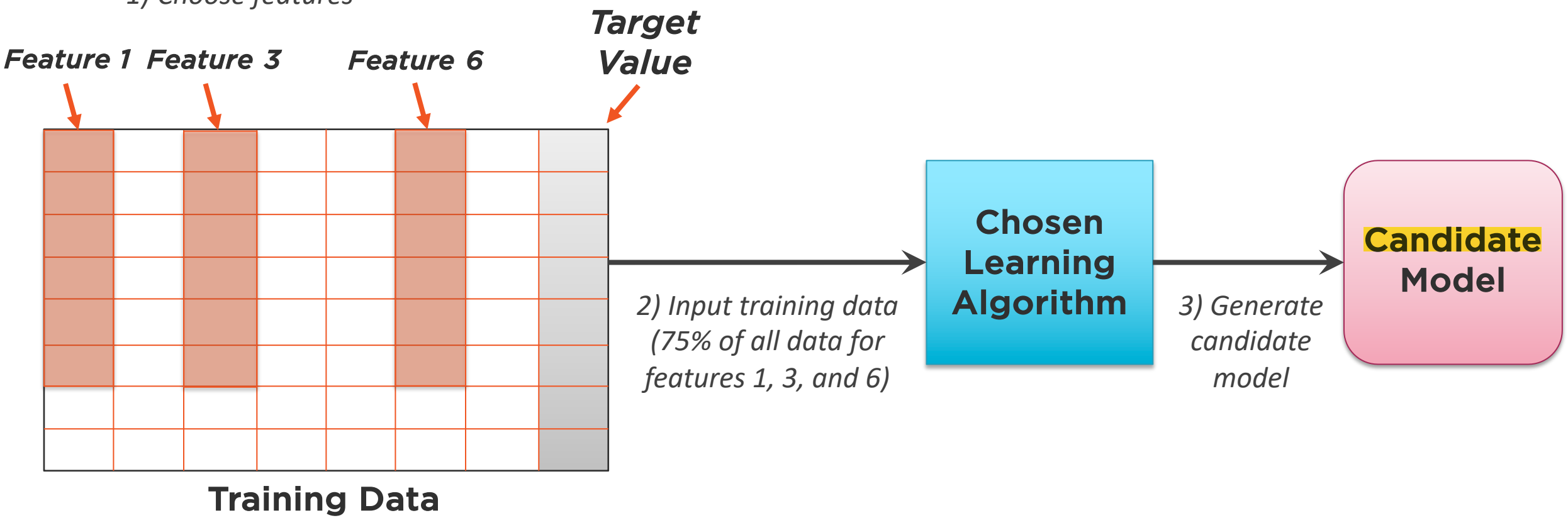


K-means clustering

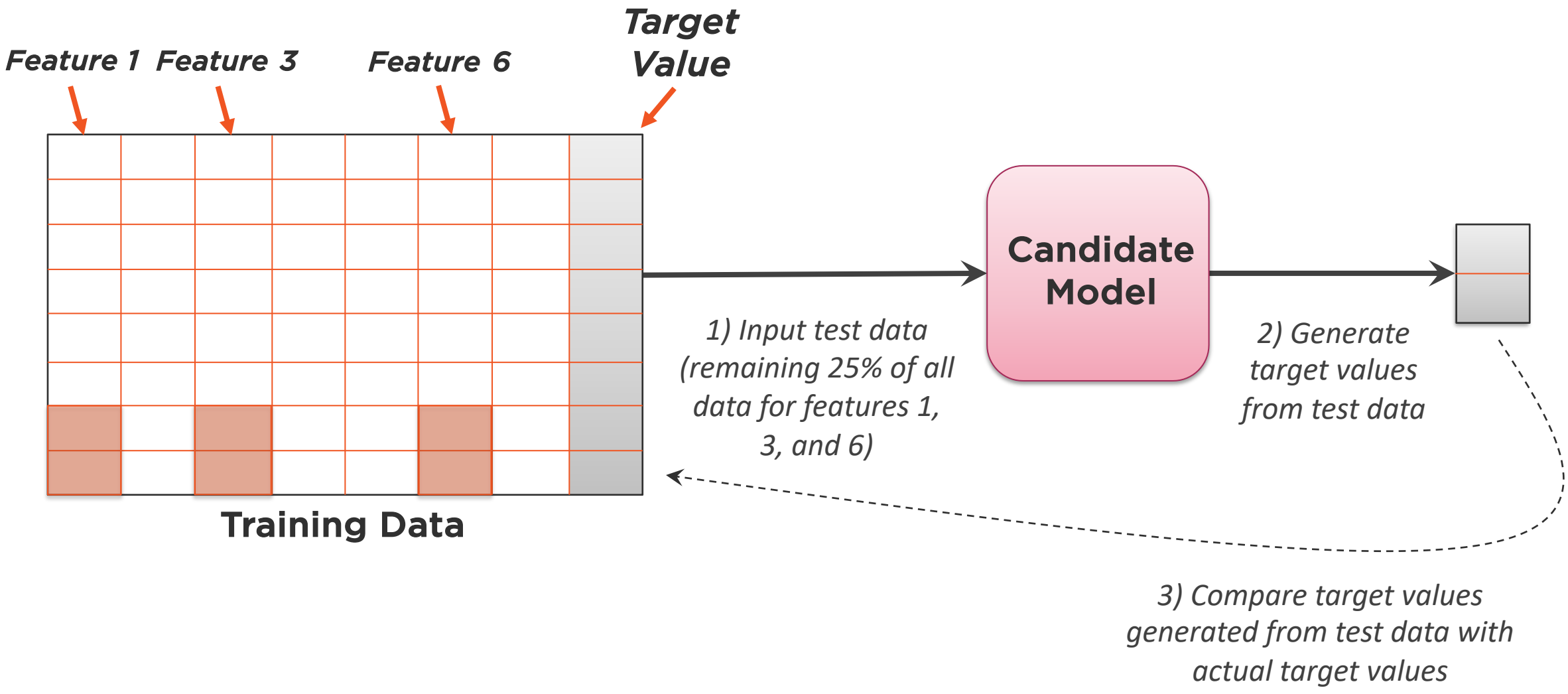
Training a Model with Supervised Learning

choosing features requires help (domain-expert)

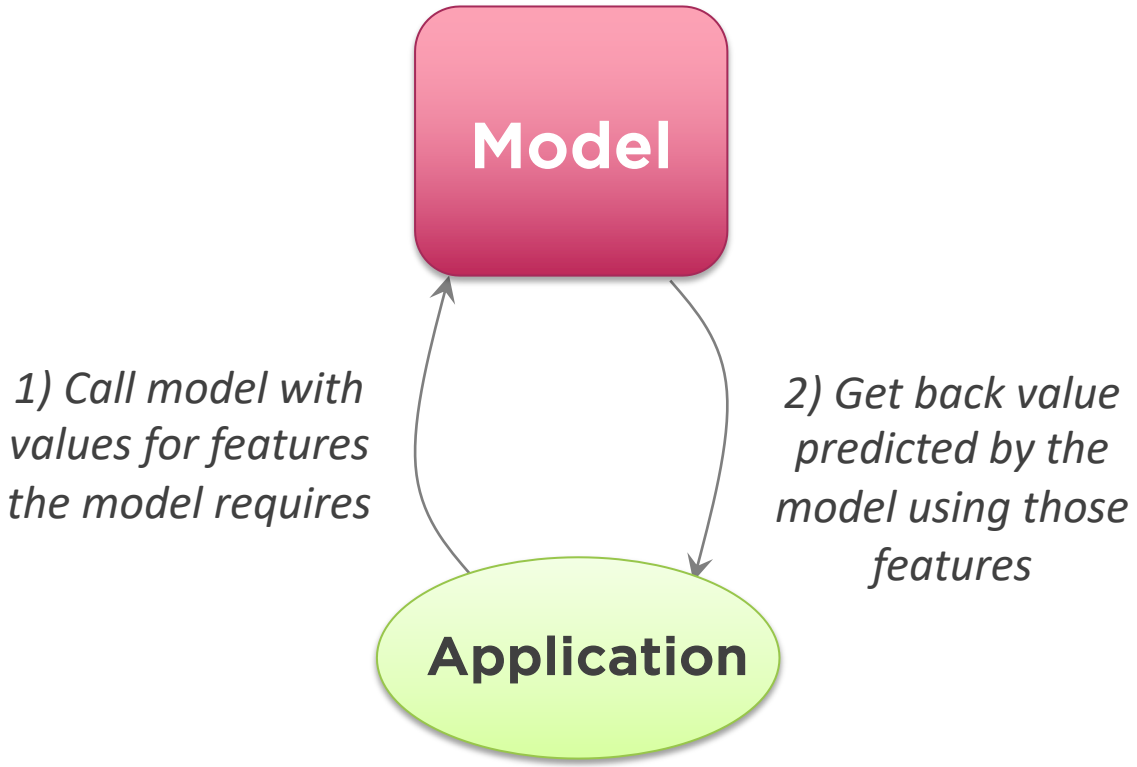
1) Choose features



Testing a Model with Supervised Learning



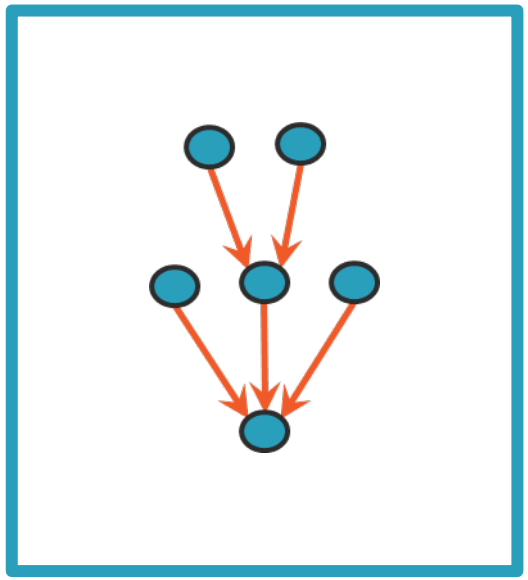
Using a Model



Implementing Machine Learning: Example Technologies

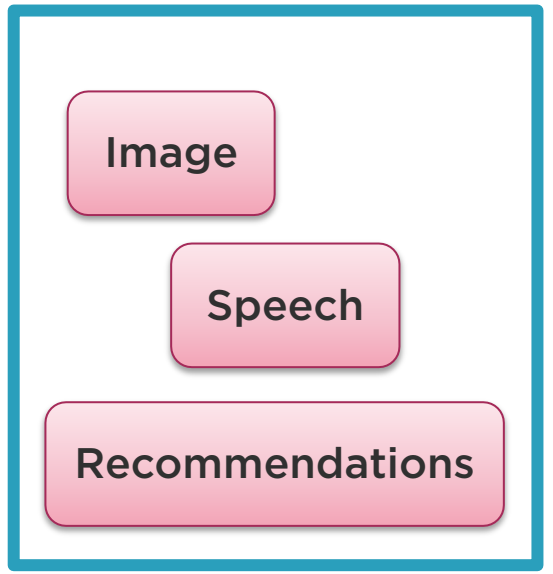
Create custom models in R and Python using general ML packages

sickit learn



Create custom models using more focused packages, e.g., TensorFlow

Create custom models using cloud ML services, e.g., Amazon SageMaker



Use pre-defined models, e.g., Azure Cognitive Services

Summary

Machine learning has come of age

Machine learning isn't hard to understand

- Although it can be hard to do well

Machine learning can probably help your organization