Machine Learning
W2 Tutorial

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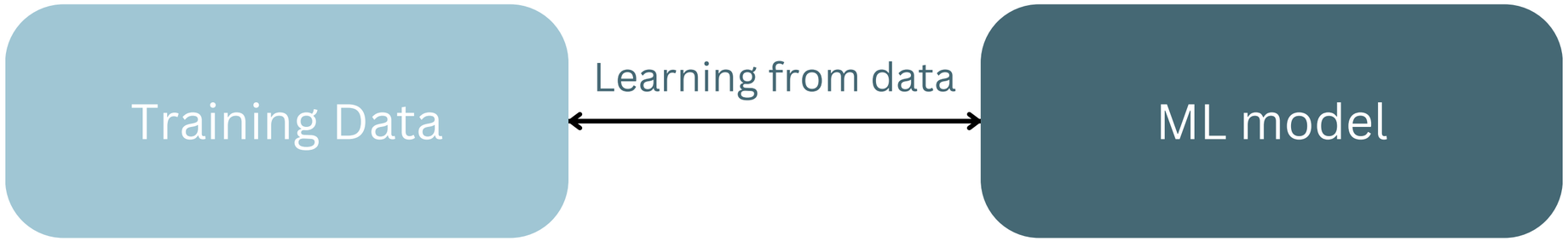
Machine Learning Tasks

- Predicting stock prices (time series forecasting)
- Classifying emails as spam or not spam (text classification)
- Detecting fraudulent transactions (anomaly detection)
- Recognising objects in an image (image classification)
- Generating captions for images (image-to-text generation)
- Detecting sentiment in a product review (sentiment analysis)
- Converting speech to text (automatic speech recognition)
- Translating a sentence from English to French (machine translation)

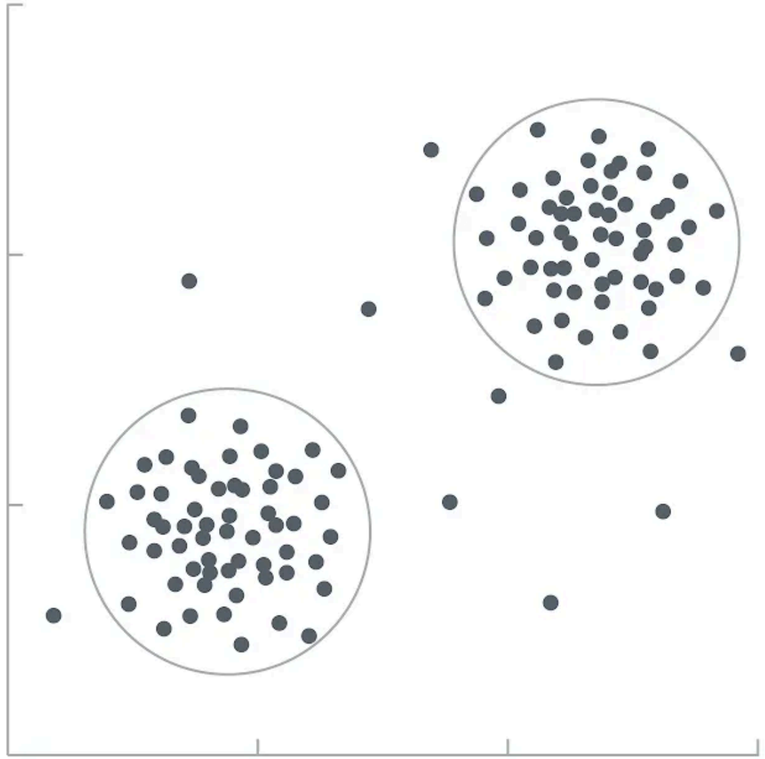


Example task: Translating English → French

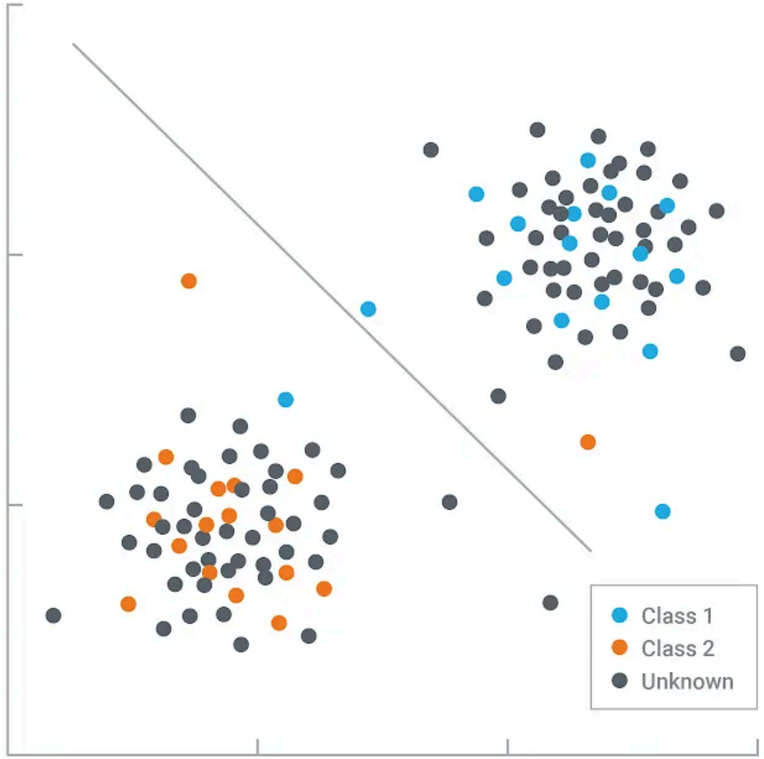
source	target
Hello	Bonjour
Thank you	Merci
...	...

instance

UNSUPERVISED



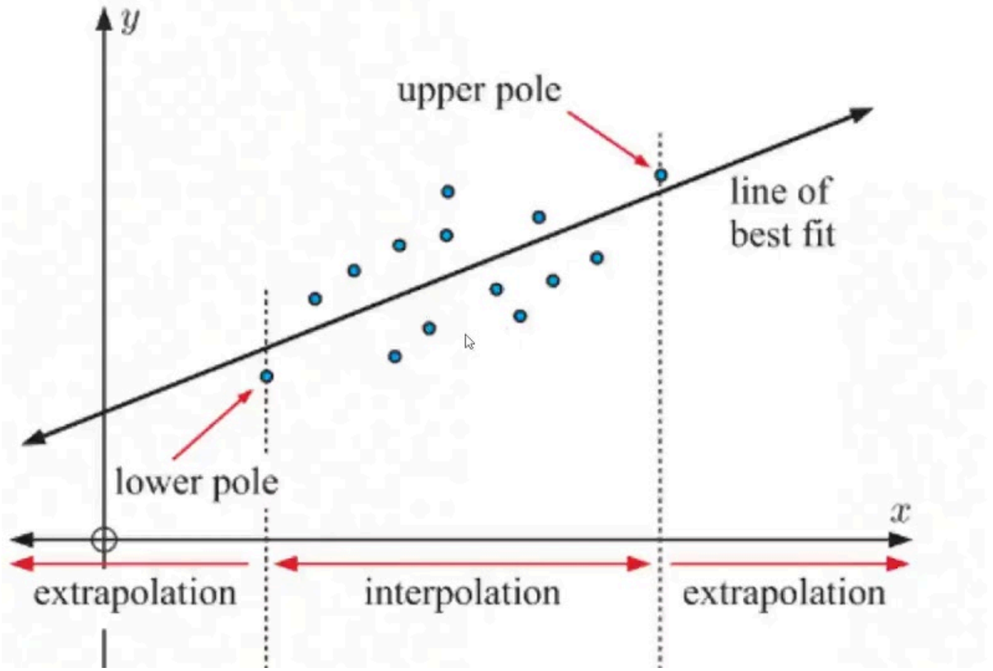
SUPERVISED



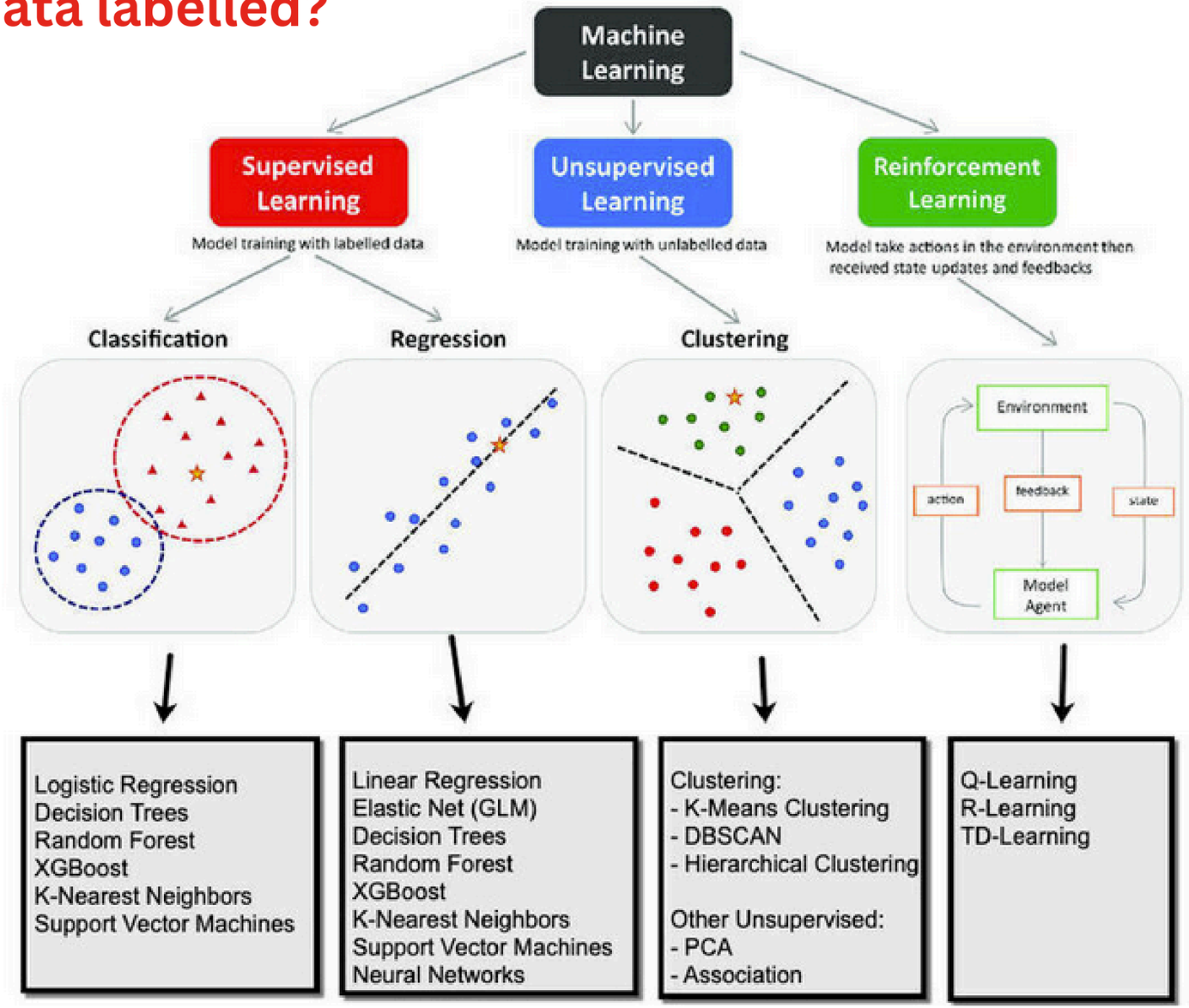
Interpolation / Extrapolation

In between the points = reliable

Outside the points = unreliable



Is the training data labelled?



Tutorial Questions

Considering the following problems:

1. Skin cancer screening test
2. Building a system that guesses what the weather (temperature, precipitation, etc.) will be like tomorrow
3. Predicting products that a customer would be interested in buying, based on other purchases that customer has previously made

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Q2: Identify instances & attributes

1. Instance: patient; Attributes: tests, images etc.

2. Instance: day; Attributes: corresponding data (temp, rain…)

3. Instance: customer / customer-product; Attributes: customer purchase history, customer information…

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Q3: Supervised or unsupervised? What model?

1. Supervised classification

2. Supervised classification / regression

3. Supervised classification / unsupervised clustering

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Q4/5: Generalisation and assumptions