Three main categories of machine learning

Supervised	Unsupervised	Reinforcement
• Algorithms are fed with training data, **previously labelled and marked** with a specific classification by humans. • Over time the machine learns to identify similarities and recognize patterns.	• Algorithms are fed with training data that are **not labelled by humans**. • Over time the machine is able to distinguish patterns based on which it creates groups and even sub-groups.	• Algorithms are fed with **more complex, also unlabelled** datasets. • The machine seeks to achieve a desired outcome by maximizing **rewards** and minimizing **penalties**, similar to the human trial and error approach.

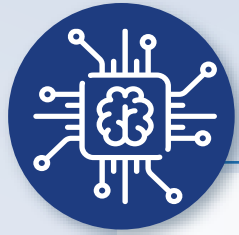# Supervised learning example

Example: image recognition

Each picture is **labelled in advance** with a specific label as a "cat" or a "dog". With training, the algorithm can tell if a new picture shows a cat, a dog, or something completely different.
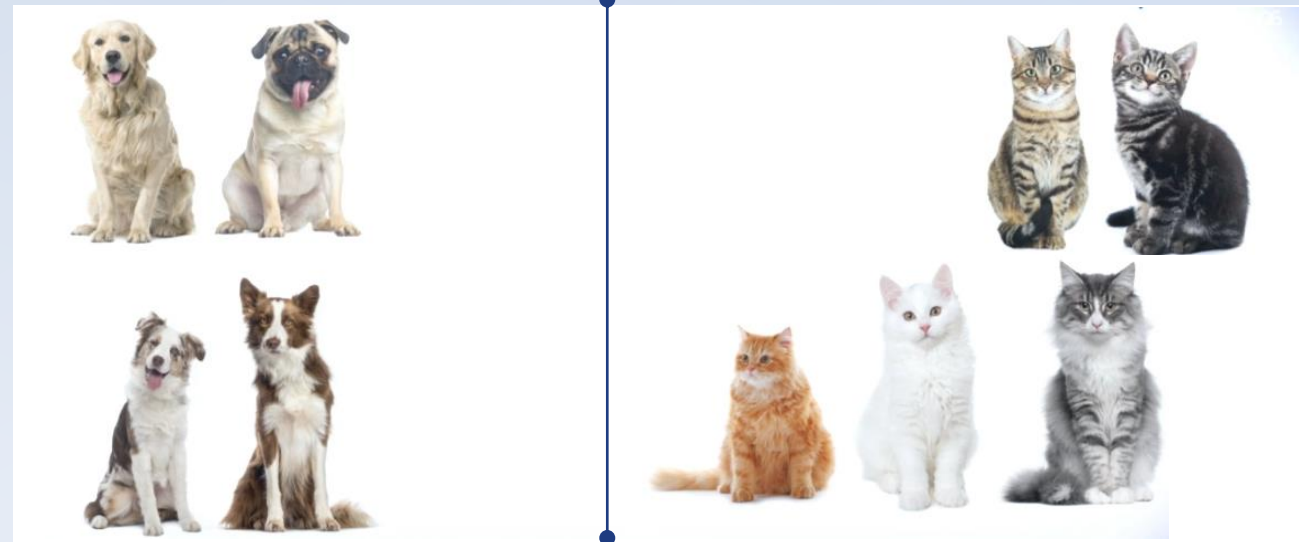

Classification

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Unsupervised learning example

Example: image recognition

The algorithm is forced to analyse **unlabelled** training pictures of cats and dogs completely on its own and learn to group them according to certain optical similarities.

Clustering

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Reinforcement learning example

Example: video gaming

The machine tries out different game **scenarios** until it learns how to optimally play the game depending on specific situations in order to achieve maximum success.

Penalties vs. rewards

- Maximise rewards
- Minimise penalties

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