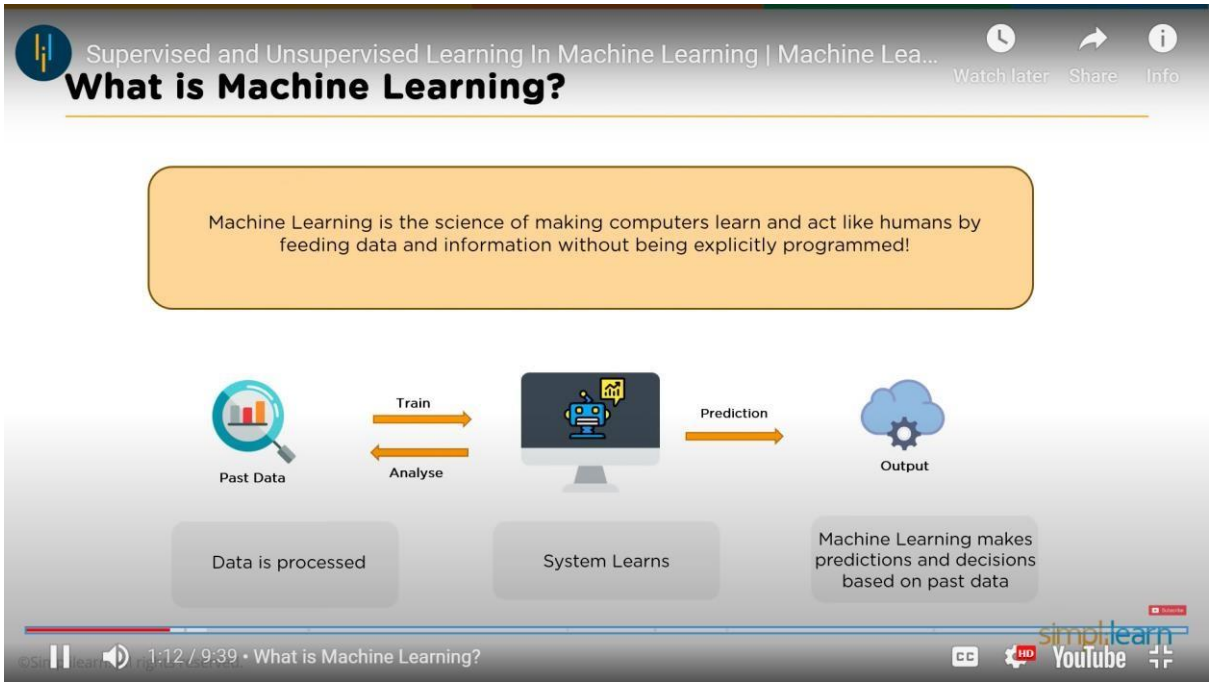
PRIOR KNOWLEDGE

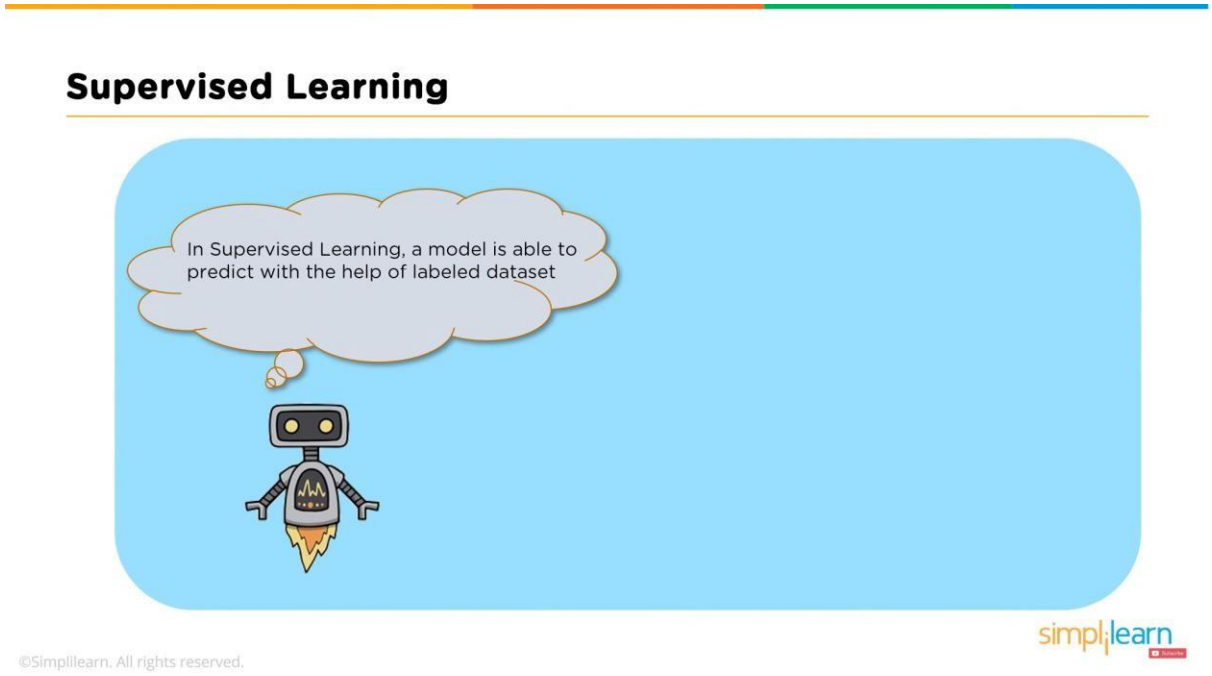
Machine learning

Machine learning is defined as making machines learn and act as humans by feeding them with data.



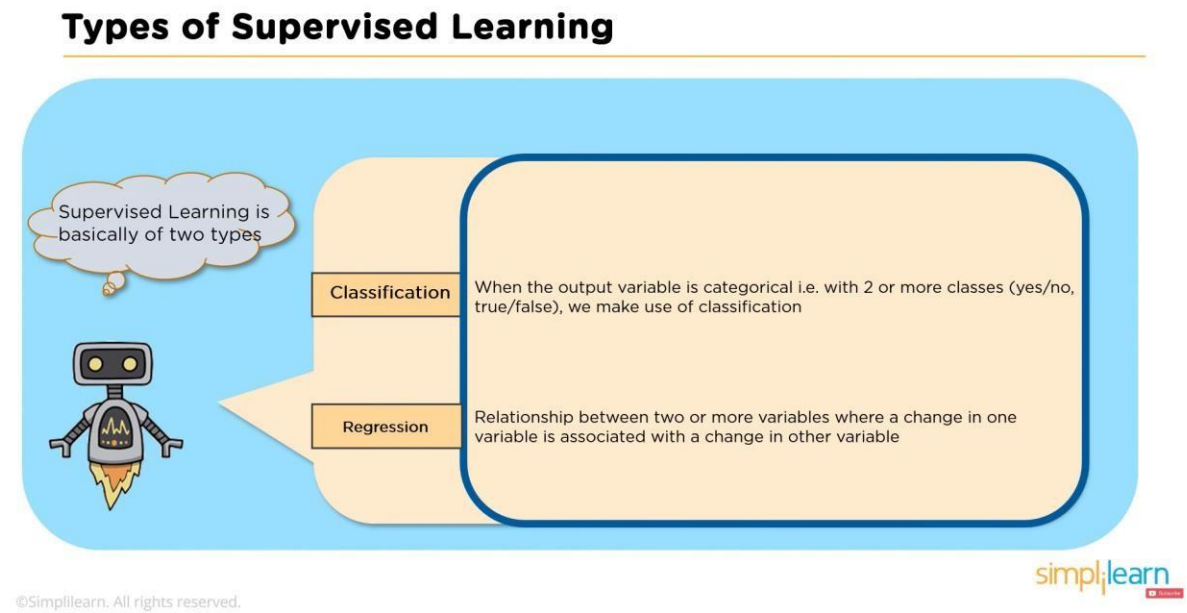
There are two types of learning in machine learning.

1. Supervised learning

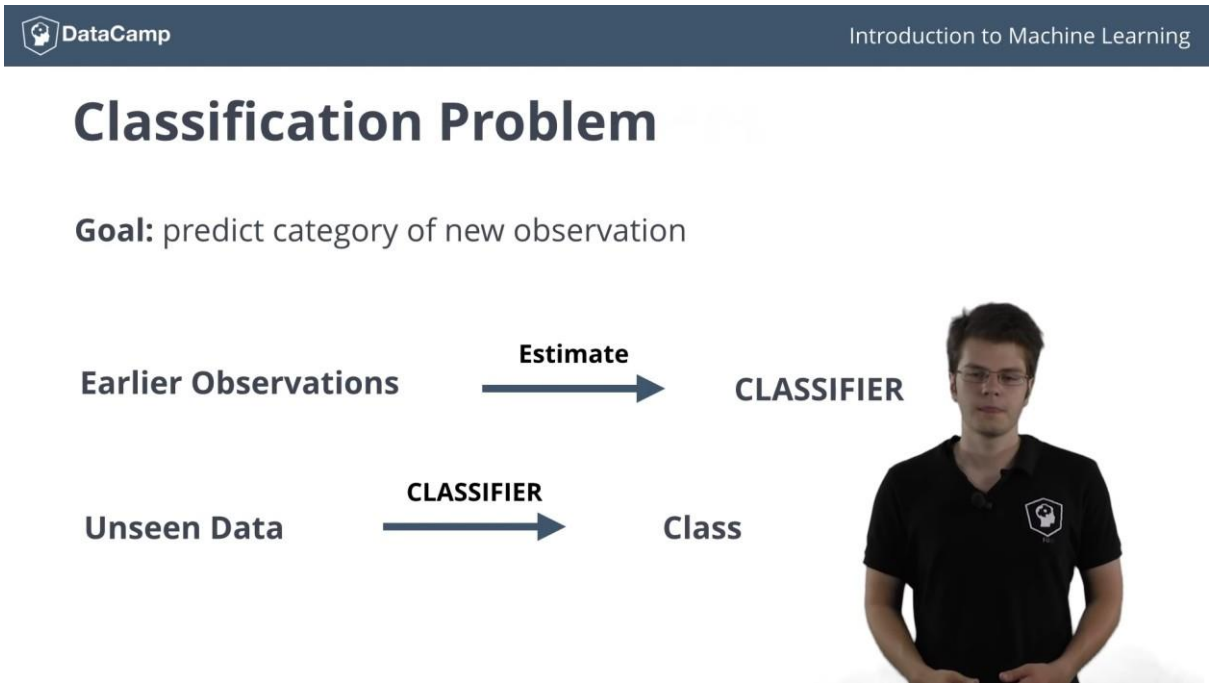


Supervised learning is done with the help of a labelled dataset.

Two types of supervised learning



1. Classification



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Classification Applications

- **Medical Diagnosis**
- **Animal Recognition**

Important:

- Qualitative Output
- Predefined Classes

2. Regression

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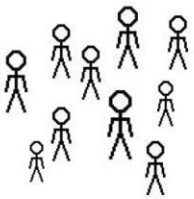
Regression

PREDICTORS → **REGRESSION FUNCTION** → **RESPONSE**



- Relationship: **Height** - **Weight**?
- Linear?
- Predict: **Weight** ⟶ **Height**

Regression Model

Fitting a **linear** function

$$\text{Height} \approx \beta_0 + \beta_1 \times \text{Weight}$$

- **Predictor:** Weight
- **Response:** Height
- **Coefficients:** β_0, β_1

Estimate on previous input-output

```
> lm(response ~ predictor)
```

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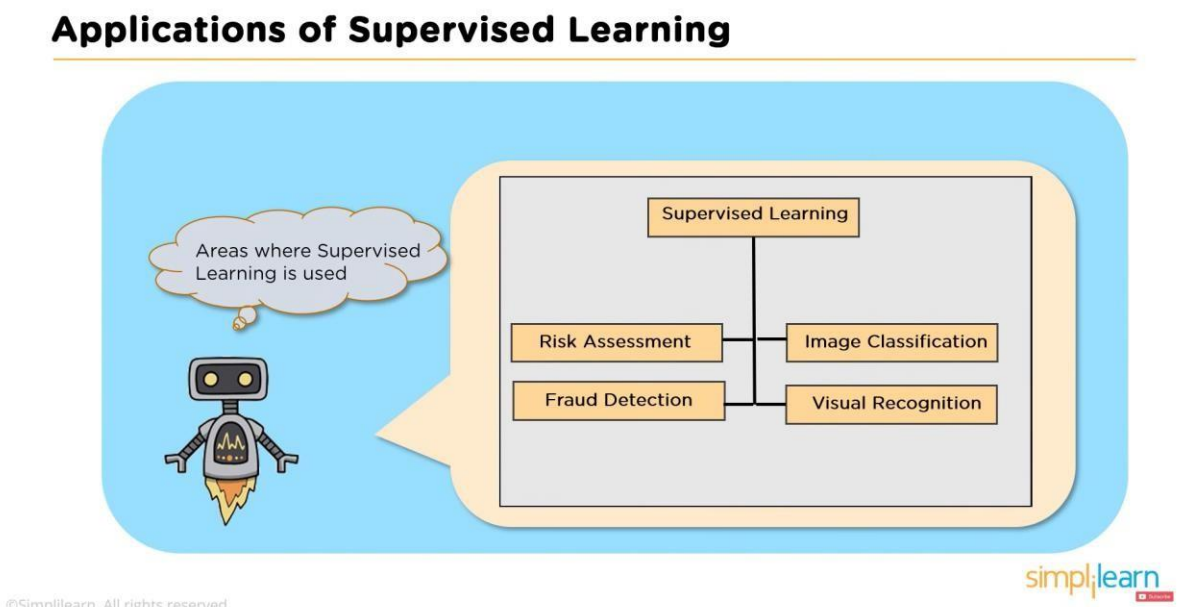
Regression Applications

- Payments → Credit Scores
- Time → Subscriptions
- Grades → Landing a Job

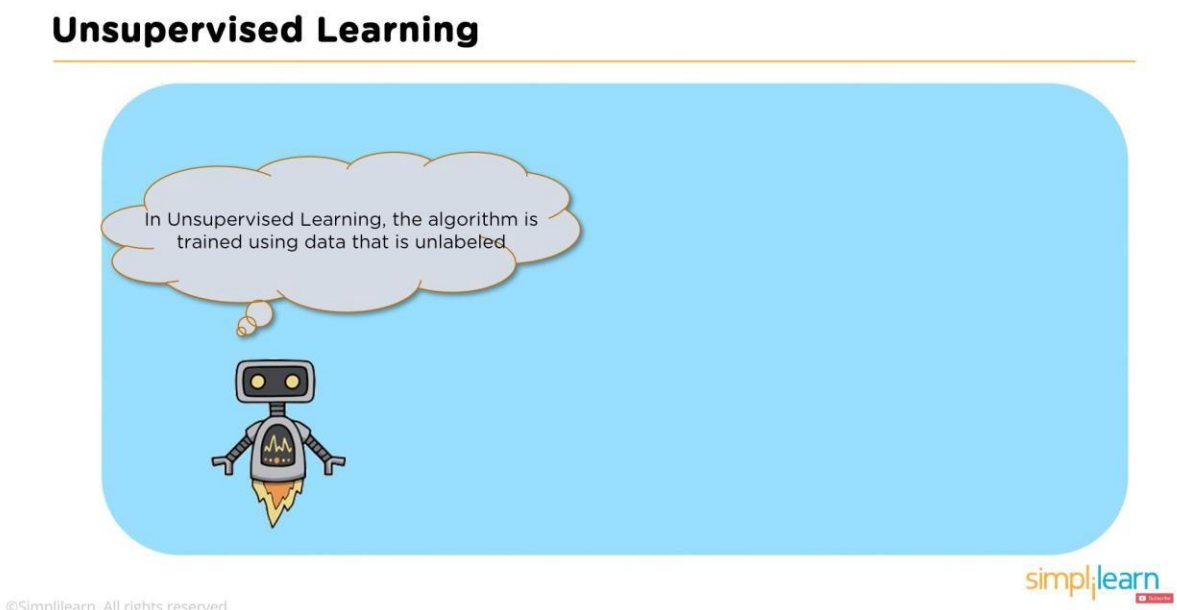
- Quantitative Output
- Previous **input-output** observations

Applications of supervised learning

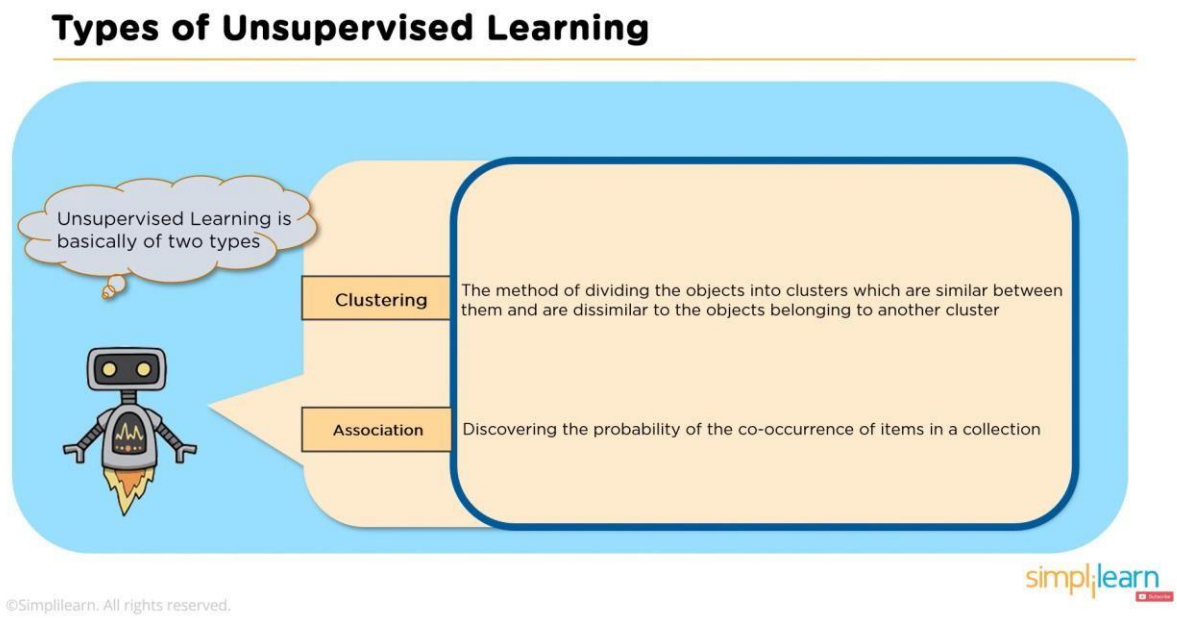


2. Unsupervised learning

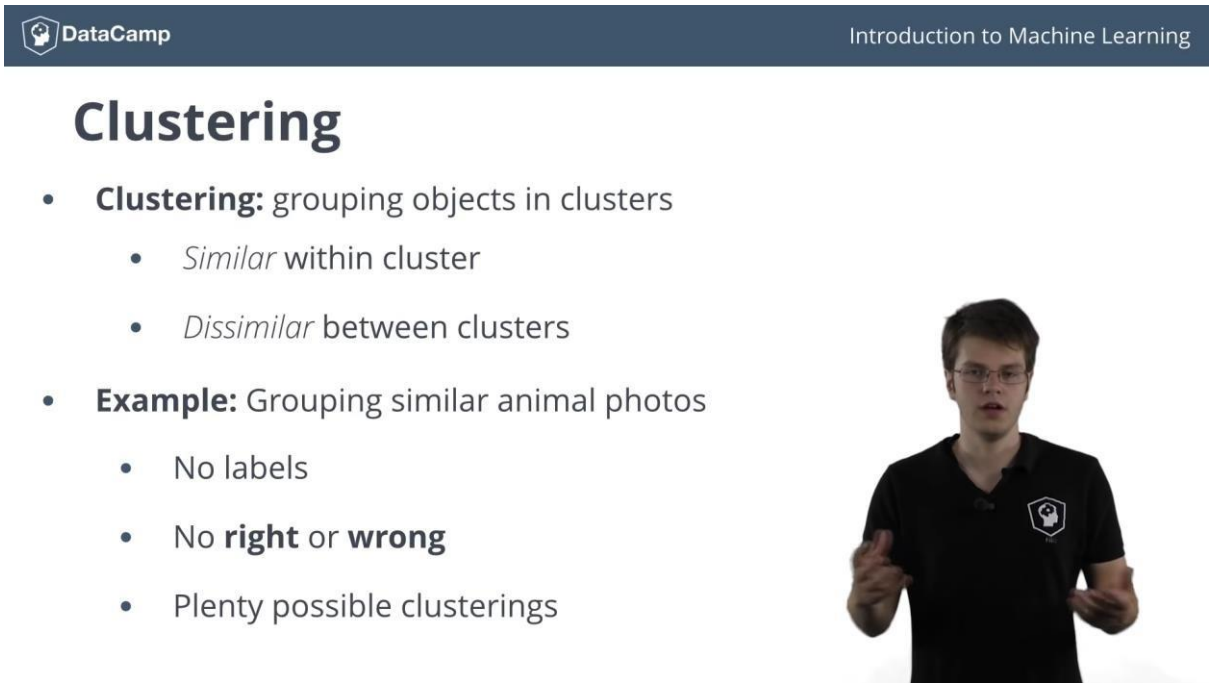
Unsupervised learning is defined as using unlabelled data to train the model.



Types of unsupervised learning



a) Clustering



b) Association

Applications of unsupervised learning