# Supervised learning

Autumn 2020

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##  Machine Learning Fundamentals with Python  ##
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§1 Supervised Learning with scikit-learn
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§1.1 Classification
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§1.1.1 Supervised learning
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**1. What is machine learning?**

Machine learning gives computers the ability to learn to make decisions from data without being explicitly programmed!

**2. What is the difference between supervised learning and unsupervised learning?**

- Supervised learning → *labeled data*
- Unsupervised learning → *unlabeled data*

**3. What is the aim of supervised learning?**

- Predict the target variable, given the features.
  - features = *predictor variables* = *independent variables*
  - target variable = *dependent variable* = *response variable*

**4. What is the difference between classification and regression?**

- Classification → *target variable consists of categories*
- Regression → *target variable is continuous*

**5. What can supervised learning do?**

- Automate time-consuming or expensive manual tasks.
- Make predictions about the feature.
- Need labeled data, such as the historical data with labels, the crowd-sourcing labeled data, or the labeled data obtained through some experiments.

**6. Practice question for a classification problem:**

- Which of the 4 example applications below of machine learning is a supervised classification problem?

  ☒ Use labeled financial data to predict whether the value of a stock will go up or go down next week.

  ☐ Use labeled housing price data to predict the price of a new house based on various features.

  ☐ Use unlabeled data to cluster the students of an online education company into different categories based on their learning styles.

  ☐ Use labeled financial data to predict what the value of a stock will be next week.