# Basic concepts

Number of features of dataset is the **dimension** or **dimensionality**

**Features** are also called **attributes**, a **feature vector** is also called an **instance**

A model is usually a predictive model or to predict something from the structure of the data itself.

Learning

The learned model can also be called a **hypothesis** or a **learner** or **predictor**

In supervised learning the goal is to predict the value of a target feature on unseen instances

* If the label is categorical, the task is **classification**
* If the label is numerical, the task is **regression**

## Popular learning algorithms

### Linear discriminant analysis

A linear classifier consists of a weight vector w and a bias b

Given the instance x, the predicted class label y is obtained according to

To find the best w and b, a classical learning algorithm is the Fisher Linear Discriminant Analysis

**Closed-form solution:** it means that the solution is an equation rather than an iterative process

### Decision trees

The key element of a decision tree algorithm is how to select the splits