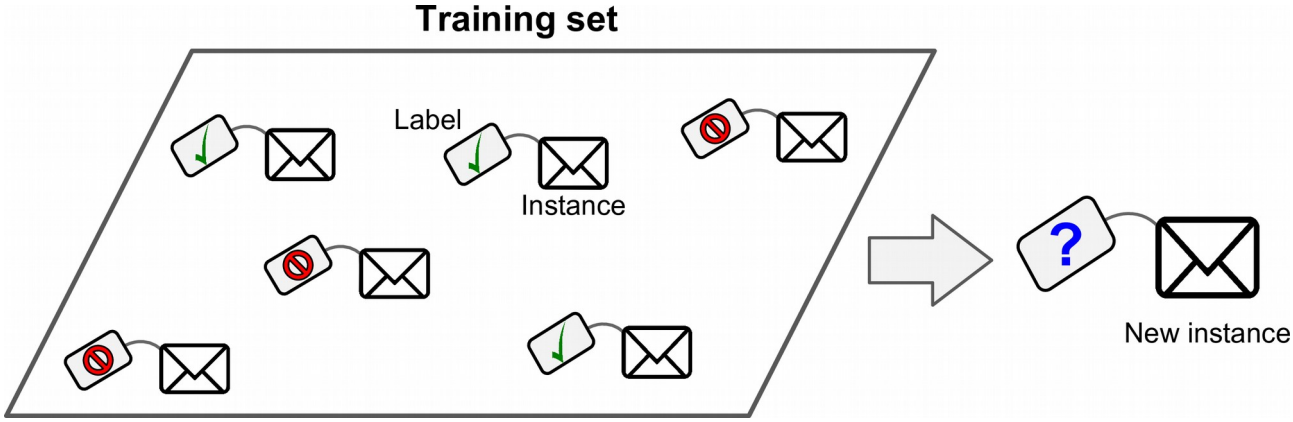
Supervised and Unsupervised Learning

Machine Learning systems can be classified according to the amount and type of supervision they get during training. There are two major categories: supervised learning and unsupervised learning.

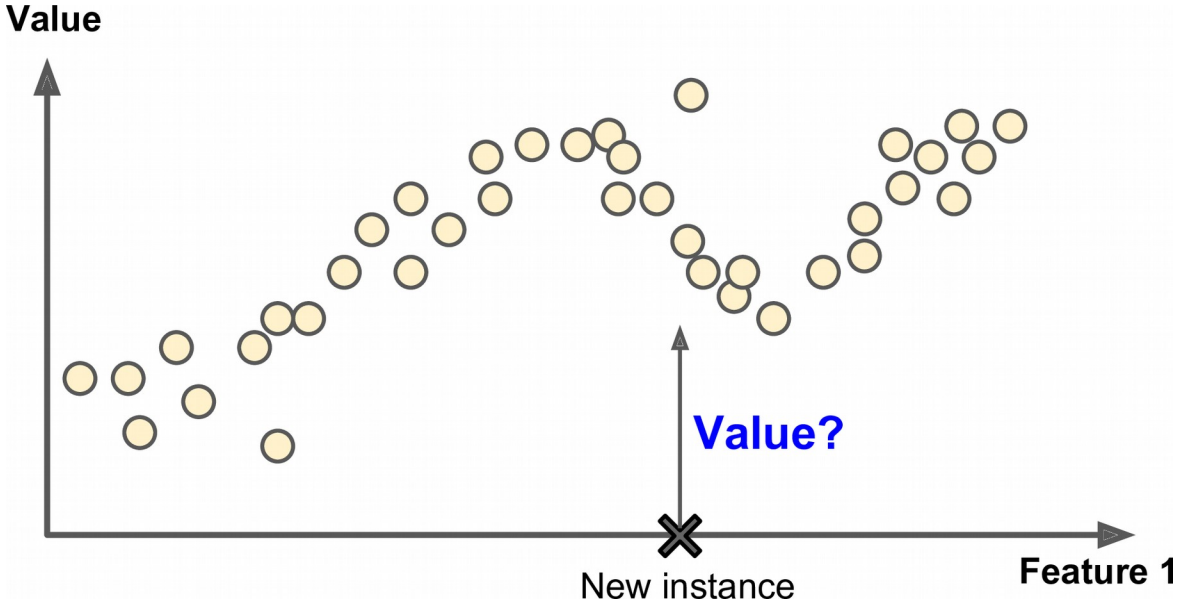
Supervised Learning

In supervised learning, the training data you feed to the algorithm includes the desired solutions, called labels.

A typical supervised learning task is classification. The spam filter is a good example of this: it is trained with many example emails along with their class (spam or ham), and it must learn how to classify new emails.



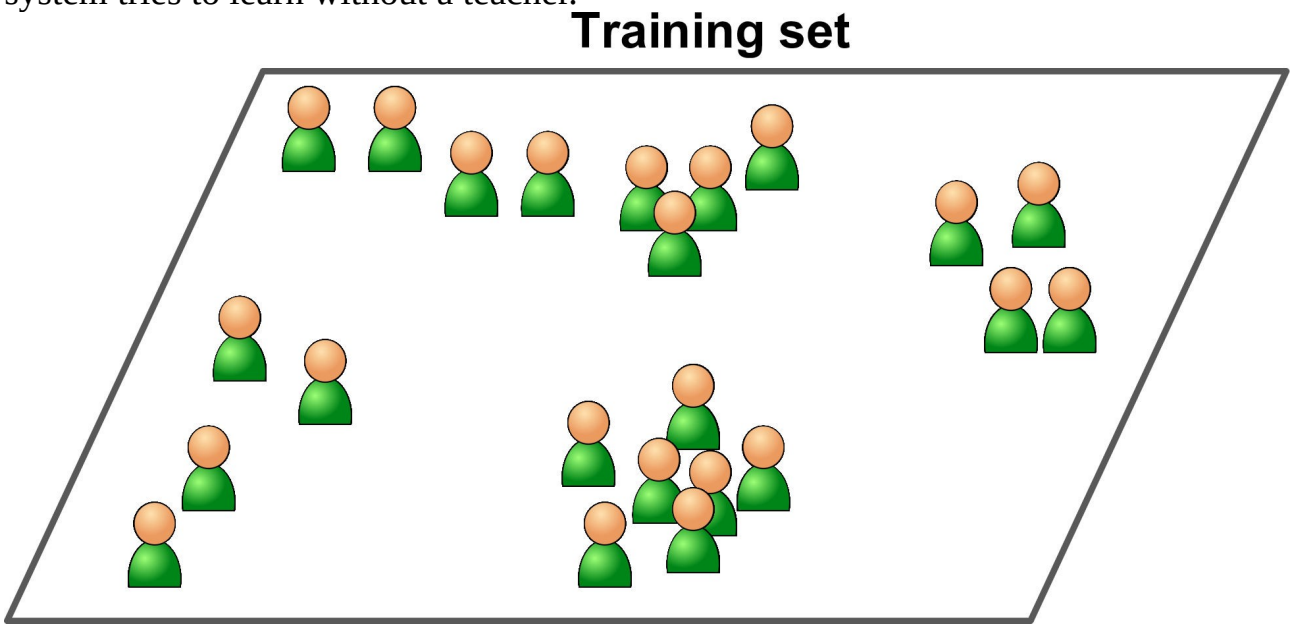
Another typical task is to predict a target numeric value, such as the price of a car, given a set of features (mileage, age, brand, etc.) called predictors. This sort of task is called regression. To train the system, you need to give it many examples of cars, including both their predictors and their labels (i.e., their prices).



In Machine Learning an attribute is a data type (e.g., “Mileage”), while a feature has several meanings depending on the context, but generally means an attribute plus its value (e.g., “Mileage = 15,000”). Many people use the words attribute and feature inter changeably, though.

Unsupervised Learning

In unsupervised learning, as you might guess, the training data is unlabeled. The system tries to learn without a teacher.



For example, say the above data tells us about your blog’s visitors. You may want to run an algorithm to try to detect groups of similar visitors. At no point do you tell the algorithm which group a visitor belongs to: it finds those connections without your help. For example, it might notice that 40% of your visitors are males who love comic books and generally read your blog in the evening, while 20% are young sci-fi lovers who visit during the weekends, and so on. If you use a better algorithm, it may also subdivide each group into smaller sub-groups. This may help you target your posts for each group.