**Machine Learning:**

Machine learning is a field of computer science in which computers learn to do tasks by experince and they need not be explicitly programmed to do

Machine Learning is great for:

* Problems for which existing solutions require a lot of fine-tuning or long lists of

rules: one Machine Learning algorithm can often simplify code and perform bet‐

ter than the traditional approach.

* Complex problems for which using a traditional approach yields no good solu‐

tion: the best Machine Learning techniques can perhaps find a solution.

* Fluctuating environments: a Machine Learning system can adapt to new data.
* Getting insights about complex problems and large amounts of data.

Types of Maching Learning:

1. Supervision:   
    a) Supervised  
    b) Unsupervised   
    c) semisupervised   
    d) Reinforcement Learning
2. Frequency:

a) Online Learning

b) Batch Learning

1. Model:

a) Instance Based

b) Model Based

**Supervised Learning:** In supervised learning you feed a training set to the algorithm which 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 (Figure 1-6). 1 To train the system, you need to give it many examples

of cars, including both their predictors and their labels (i.e., their prices).

**Unsupervised Learning:** In unsupervised learning you give a training set but with no labels to it.