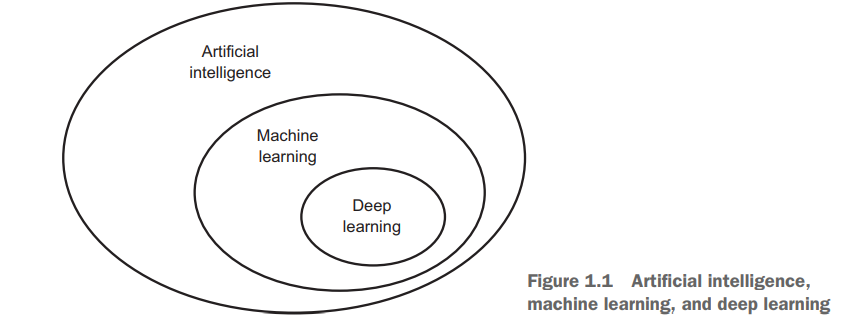
**Chapter 1 Summary:**

# **This chapter covers**

* High-level definitions of fundamental concepts
* Timeline of the development of machine learning
* Key factors behind deep learning’s rising popularity and future potential



**Artificial Intelligence** since 1950s

Human learning on the basics of experiment is called intelligence. If we put this intelligence in machine it is called Artificial Intelligence.

Artificial Intelligence is Ability of a computer program or a machine to think and learn itself. In One Line (Simply A Program that can sense, Reason, act & adapt.)

**Explore** **Symbolic AI:** Using If-else, password checking. Problem (Tagging, perception problem) , Classical Programing , Handcrafted Rules.

**Explore**: Turning Test

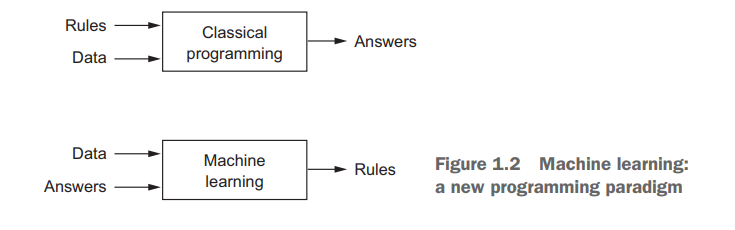
**Machine Learning** …1990s

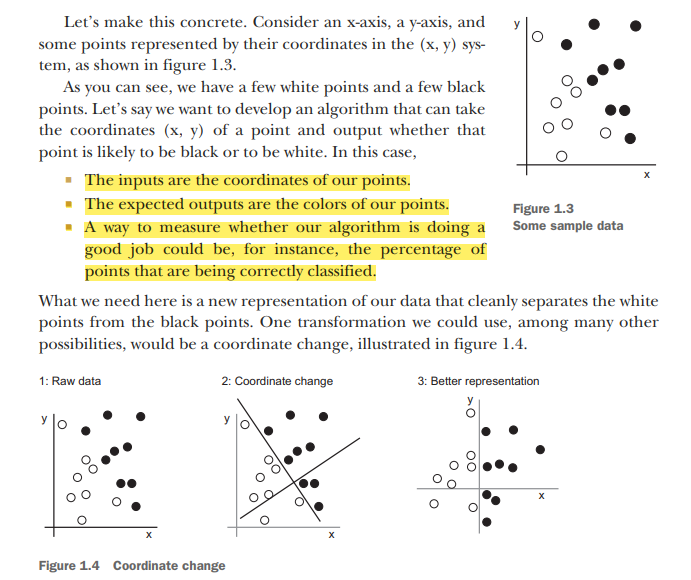
Machine Learning is a subset of AI Algorithms whose performance improves as they are exposed to more data over time.

In simple a machine that can learn from data, not from handcrafted rules.

**Two Points**

* Machine have the ability to learn from data.
* Not learn from Hand crafted rules.
* A machine-learning system is trained rather than explicitly programmed.

****Three Things we need to remember in ML **Input + Programs = Output**

**Example:**

**This new representation basically solves the classification problem.**

**Bayesian:**

Bayesian machine learning is a particular set of approaches to probabilistic machine learning (for other probabilistic models, see Supervised Learning).

Bayesian learning treats model parameters as random variables — in Bayesian learning, parameter estimation amounts to computing posterior distributions for these random variables based on the observed data.

**P(h/D) = P(D/h)P(h) / P(D)**

**Deep learning** (Multi Stage Learning)

A machine that learns from Neural networks models or artificial neural network inspired by the human brain& in which feature engineering is Easy as Compared to Machine learning.

**Two Points**

* We use neural network (Neurons)
* Feature Engineering is Auto

**Work Y = WX + B**

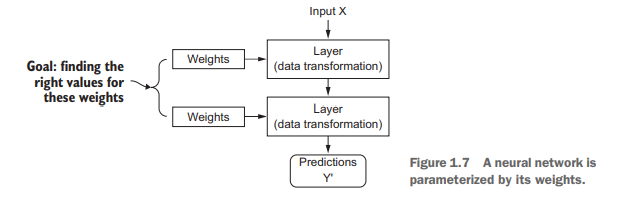
**Here X = Input**

**Y= Output**

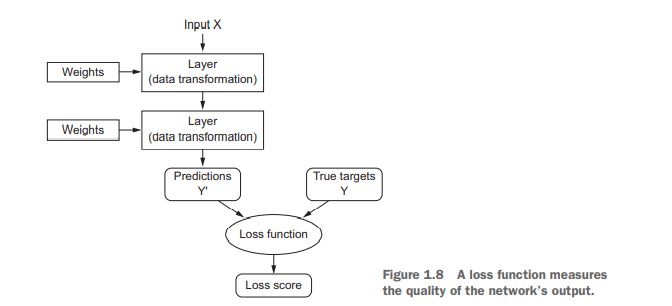
**W= Coefficient**

**B= Interception**

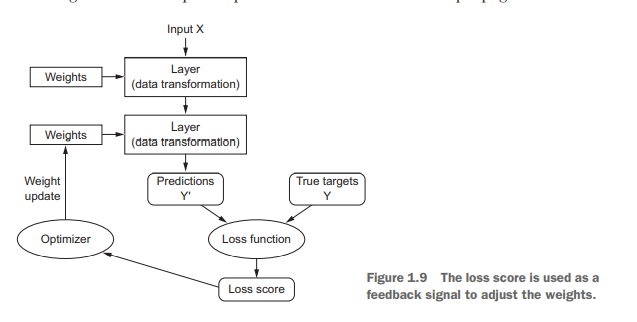
**Neural network:**

****

**Loss function:**

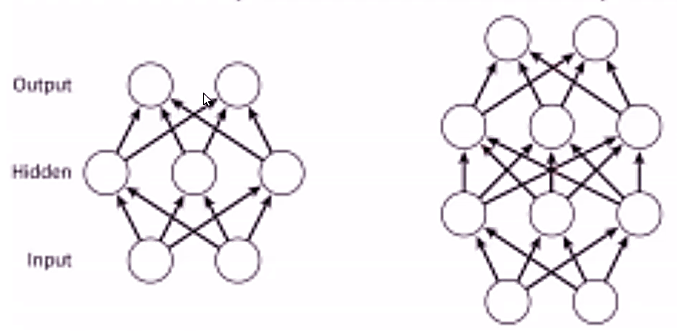
****

**Backpropagation algorithm:**

****

**Shallow Learning:**

The features extraction in Shallow Machine Learning is a manual process that requires domain knowledge of the data that we are learning from

****In other words, "Shallow Learning" is a type of machine learning where we learn from data described by pre-defined features.

While in "Deep Learning" the feature extraction is algorithmically computed without manual human intervention

**Deep learning:** Deep learning isn’t always the right tool for the job—sometimes there isn’t enough data for deep learning to be applicable, and sometimes the problem is better solved by a different algorithm. If deep learning is your first contact with machine learning, then you may find yourself in a situation where all you have is the deep-learning hammer, and every machine-learning problem starts to look like a nail. The only way not to fall into this trap is to be familiar with other approaches and practice them when appropriate.

**Probabilistic modeling (**text classification):

Naive Bayes algorithm.