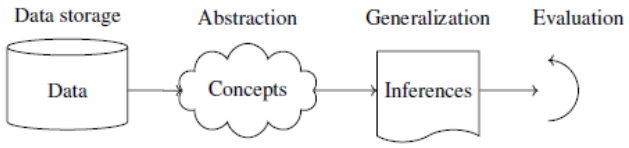
Machine Learning:

LECTURE NOTES IN MACHINE LEARNING - Dr V N Krishnachandran

Introduction to machine Learning

Definition

The field of study known as machine learning is concerned with the question of how to construct computer programs that automatically improve with experience.



The term generalization describes the process of turning the knowledge about stored data into a form that can be utilized for future action.

General classes of machine learning problems

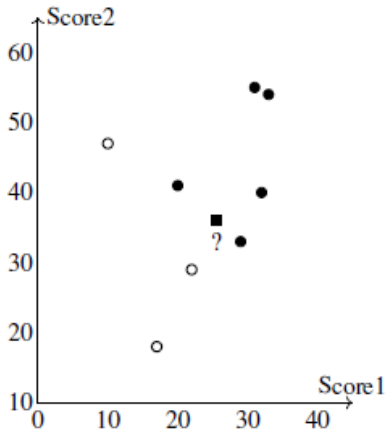
Learning associations

In finding an association rule X => Y , we are interested in learning a conditional probability of the form P(Y/X). we may estimate P(Y SX;D) where D is a set of attributes.

Classification

what value should be assigned to “Result” corresponding to the new data; in other words, to which of the two categories or classes the new observation should be assigned?

Score1	29	22	10	31	17	33	32	20
Score2	43	29	47	55	18	54	40	41
Result	Pass	Fail	Fail	Pass	Fail	Pass	Pass	Pass



To answer this question, we need to find the rule, is the classification problem. In general, even the general form of the rule or function or method will not be known.

Regression

regression problem is the problem of predicting the value of a numeric variable based on observed values of the variable.

Price (US$)	Age (years)	Distance (KM)	Weight (pounds)
13500	23	46986	1165
13750	23	72937	1165
13950	24	41711	1165
14950	26	48000	1165
13750	30	38500	1170
12950	32	61000	1170
16900	27	94612	1245
18600	30	75889	1245
21500	27	19700	1185
12950	23	71138	1105

some mathematical relation between x and y, involving some parameters say, , in the following form: y = f(x; t) The function f(x; t) is called the regression function.

There are various types of regression techniques available to make predictions:

- Simple linear regression
- Multivariate linear regression
- Polynomial regression
- Logistic regression