Machine learning lecture 2

# Term:

Feture: input attributes to target variable.

Contour function (matlab)

1. Scale the data, , where is the mean of the data, is the scaling factor.
2. Using contour function to visualize the data.

# Classification problem

Value we are trying to predict take only a small number of value.

## Formally:

=p{y=1 | x;}

P(y=0 | x;) = 1-

How to find is important.

Cost function:

GOAL: minimize the cost function

Example (2 features):

## For m = 1

Change cost function from limited range into infinite range, so:

If y = 1

Cost function = -log ;

If y = 0

Cost function =-log (1-);

## For m > 1

……...(1)

Newton method:

For

So,

is shown in the equation 1.

Apply GD:

Repeat: = – alpha \* d(aji)

|  |  |
| --- | --- |
| Comparison between GD and Newton method | |
| GD method | Newton method |
| Simpler to implement | Slightly hard |
| Depend on the value of alpha (learning rate) | No parameter |
| Needs make iterations, for each iteration, O(n) = n\*m | Fewer iteration, cost of each iteration is higher, O(n) = (n+1)\*(n+1) |
| N=10000 is good to use GD | N < = 1000 is better |