1. Objective Function using square loss:

α is used to balance L1 and L2 regularization

is the predicted value of observation ***ith*** and is computed by logistic function as following:

Given g(x) is the logistic function of x, we have:

Derivative(g(x)) = **g(x)’ = g(x) (1 – g(x))**

Using gradient descent, in each iteration, we update the parameters as following:

Here : is learning rate and we set

**iter** is the ith iteration

sign(

1. Functions:

* calLogisFunc : this function is used to calculate value of logistic function given parameters and feature’s values
* calFirstLogisDerivative: calculate derivative of :

or

* updateParam: update parameters
* costFun : calculate the value of loss function.
* learningModel: train model based on training data.
* testingModel: test model based on testing data.
* runAll: divide dataset into 10 folds and get accuracy of the model.