**Gradient descent for Logistic regression in octave**

In the discussion of Logistic Regression, exercise two, we use fminunc function rather than standard gradient descent for minimizing for theta. Exercise does not discuss how to use gradient descent for the same. If you use the code of gradient descent of linear regression exercise you don’t get same values of theta . So you will be left wondering how to use gradient descent for logistic regression. Even I also got stuck at same place and was able to figure it out after lot of trial and error. To save other’s pain I am sharing following code for the same.

Create a file called gradientDescent.m and paste the following code

function [theta,cost] = gradientDescent(X, y, theta, alpha, num\_iters)

%GRADIENTDESCENT Performs gradient descent to learn theta

% theta = GRADIENTDESENT(X, y, theta, alpha, num\_iters) updates theta by

% taking num\_iters gradient steps with learning rate alpha

% Initialize some useful values

m = length(y); % number of training examples

J\_history = zeros(num\_iters, 1);

theta\_history = theta;

for iter = 1:num\_iters

h = sigmoid(X\*theta);

grad = (X'\*(h - y))/m;

theta = theta - alpha\*grad;

end

[cost,gradient] = costFunction(theta,X,y);

Other than the calculation of h, the other code is identical to the gradient descent of the logisitic regression.

To call gradient descent , add the following lines to ex2.m

%%============= Part 4: Optimizing using Gradient Descent =============

alpha = 0.0014;

[theta,cost]= gradientDescent(X,y,

initial\_theta,alpha,2000000);

% Print theta to screen

fprintf('Cost at theta found by gradient Descent: %f\n', cost);

fprintf('theta: \n');

fprintf(' %f \n', theta);

% Plot Boundary

plotDecisionBoundary(theta, X, y);

% Put some labels

hold on;

% Labels and Legend

xlabel('Exam 1 score')

ylabel('Exam 2 score')

% Specified in plot order

legend('Admitted', 'Not admitted')

hold off;

fprintf('\nProgram paused. Press enter to continue.\n');

pause;

Now you should have gradient descent working for logistic regression.