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## Convex Optimization

## 810100511

```matlab
% Hw6 - Q3-b
% load data
clear; clc; close all;
run('team_data.m');
```

```matlab
% Init[given in Question]:
%using SparseArrays;
A1 = sparse(1:m, train(:, 1), train(:,3), m, n);
A2 = sparse(1:m, train(:, 2), -train(:,3), m, n);
A = A1 + A2;
```

Disciplined convex programming information:

**log_normcdf** is concave and nondecreasing in X. Therefore, when used

in CVX specifications, X must be concave.

```matlab
cvx_begin
variable a_approx(n)
        maximize (sum(    log_normcdf(  A * a_approx/sigma  )   )    )
    subject to

        a_approx <= 1
        a_approx >= 0
cvx_end
```

```matlab
A1 = sparse(1:m_test,test(:,1),1,m_test,n);
A2 = sparse(1:m_test,test(:,2),-1,m_test,n);
A_test = A1+A2;
res = sign(A_test*a_hat);
Pml = 1-length(find(res-test(:,3)))/m_test;
```

PML = 0.8666...  [Ran on other device due to in compatibility of the matlab version with my CVX]

```matlab
Ply = 1-length(find(train(:,3)-test(:,3)))/m_test;
```

Ply =  0.7555555...