**01.112 MACHINELEARNING (2017)**

**HW2**

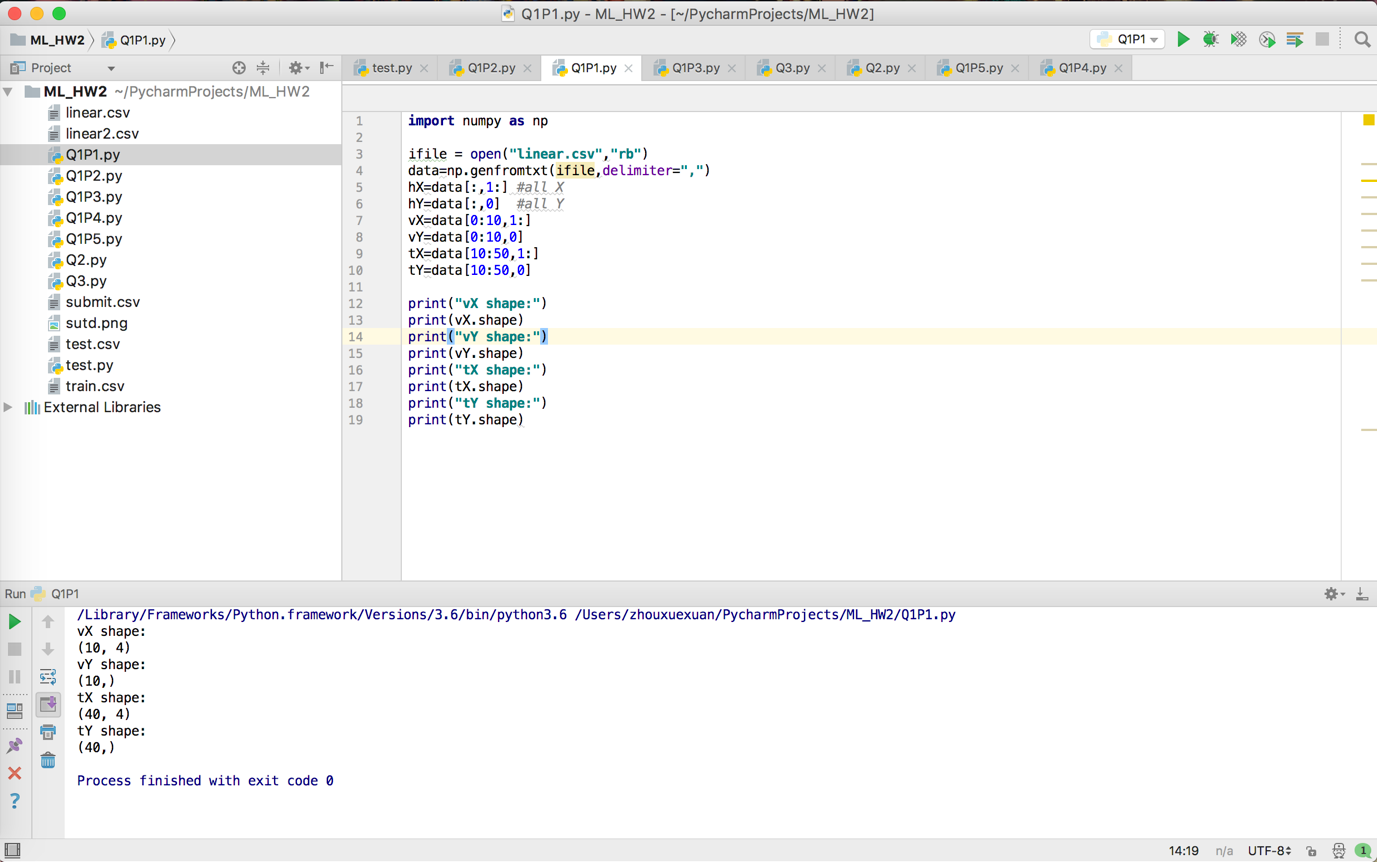
ZHOU XUEXUAN 1001603

**Q1.**

1. Output screenshot below:

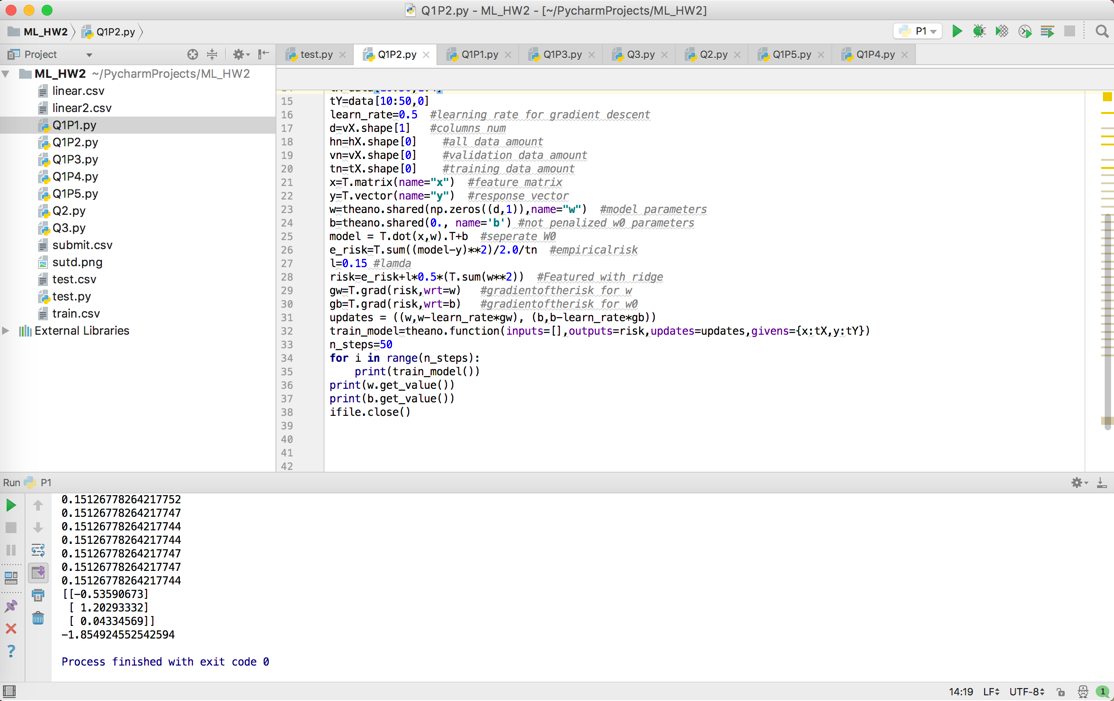
vX:(10,4), vY:(10,)

tX:(40,4), tY:(40,)

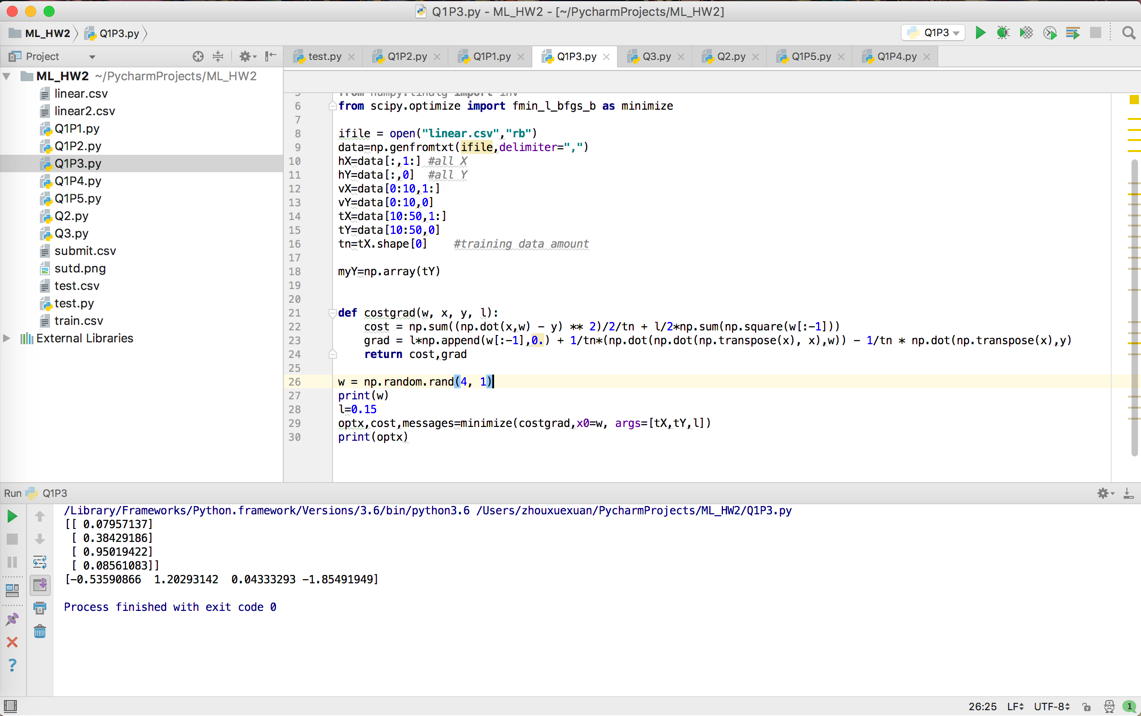


1. Down below is the output for q2

W0 will be assumed as irrelevant which is taking no penalization



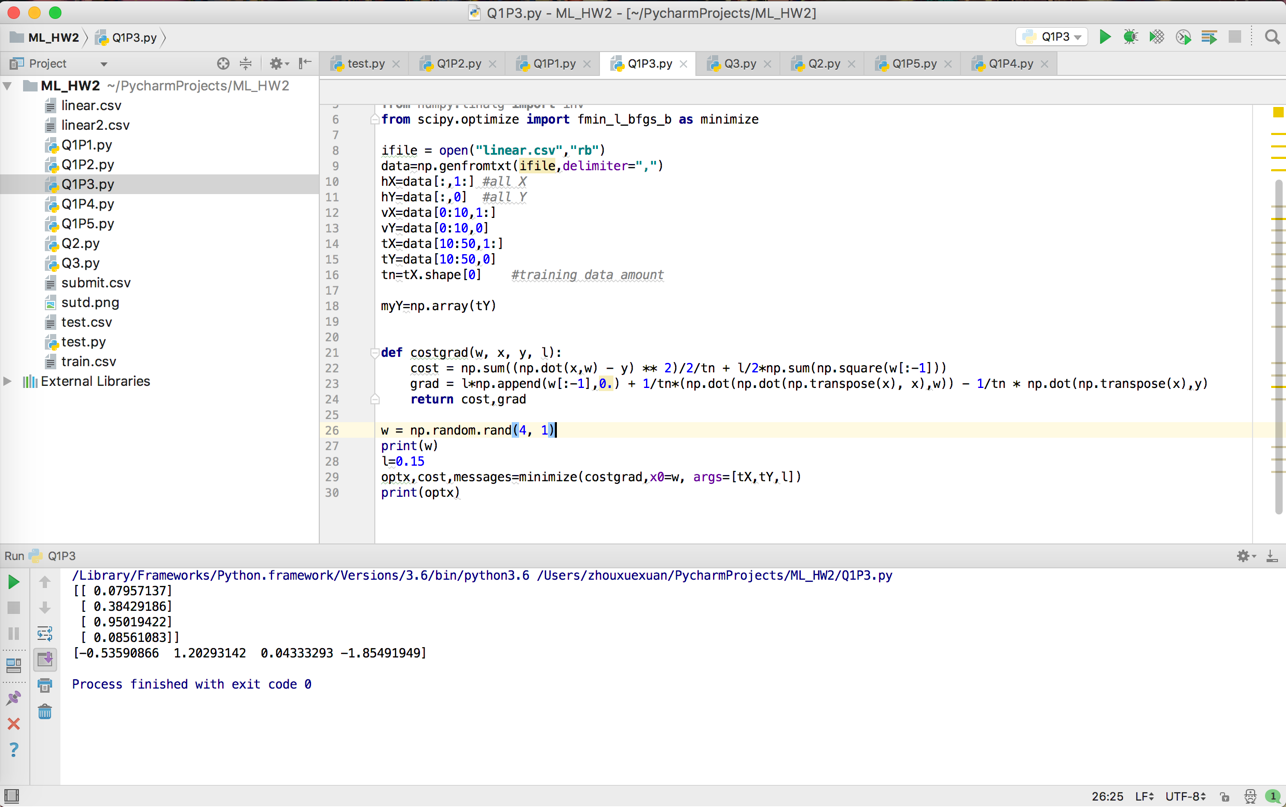
1. Scipy BFGS optimizer



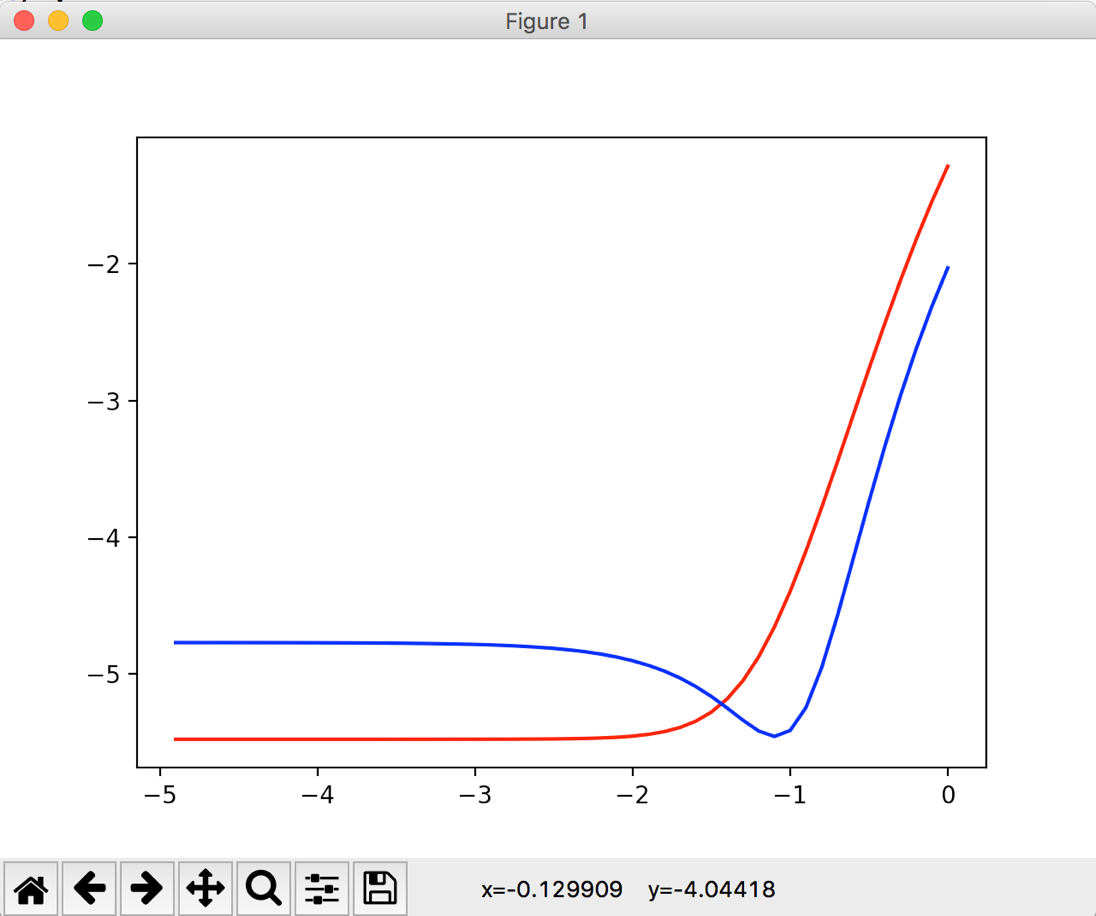
It output almost the same coef compared with w value from theano gradient decent method

1. Following is the screenshot output of the ridge\_regression function

It also returns almost the same value for tX and tY



1. Following is the graph output



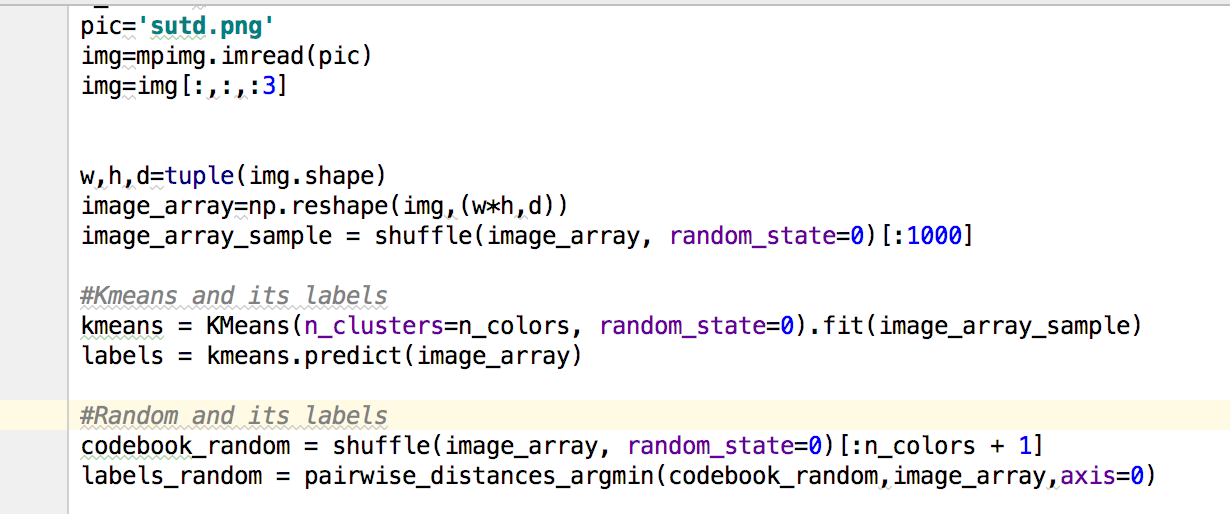
lamda = (np.log(-1))^-1 = 0.1 (which is not the exact value and lamda should be around with 0.1)

**Q2.**

Code briefing:

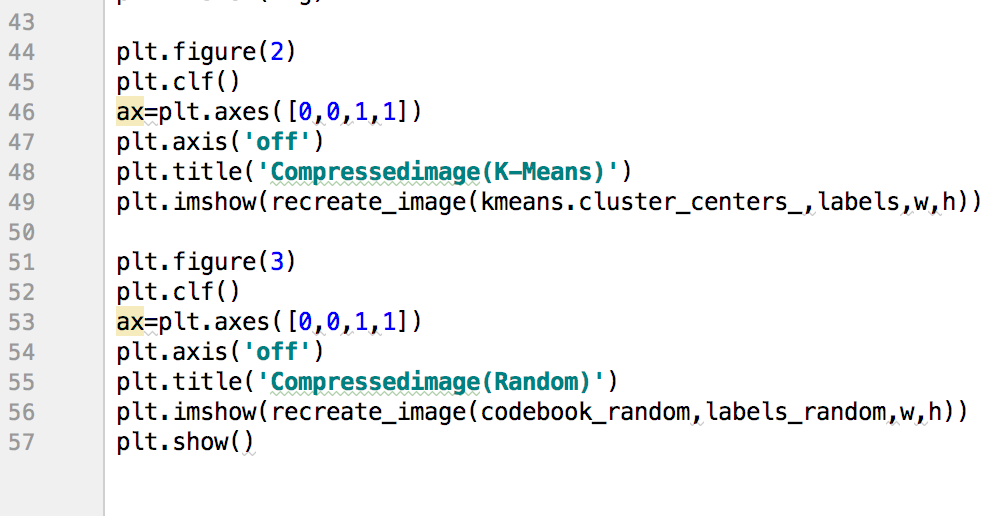
1. Setup variable for both methods:

Compute Kmeans and random codebooks and theirs labels.

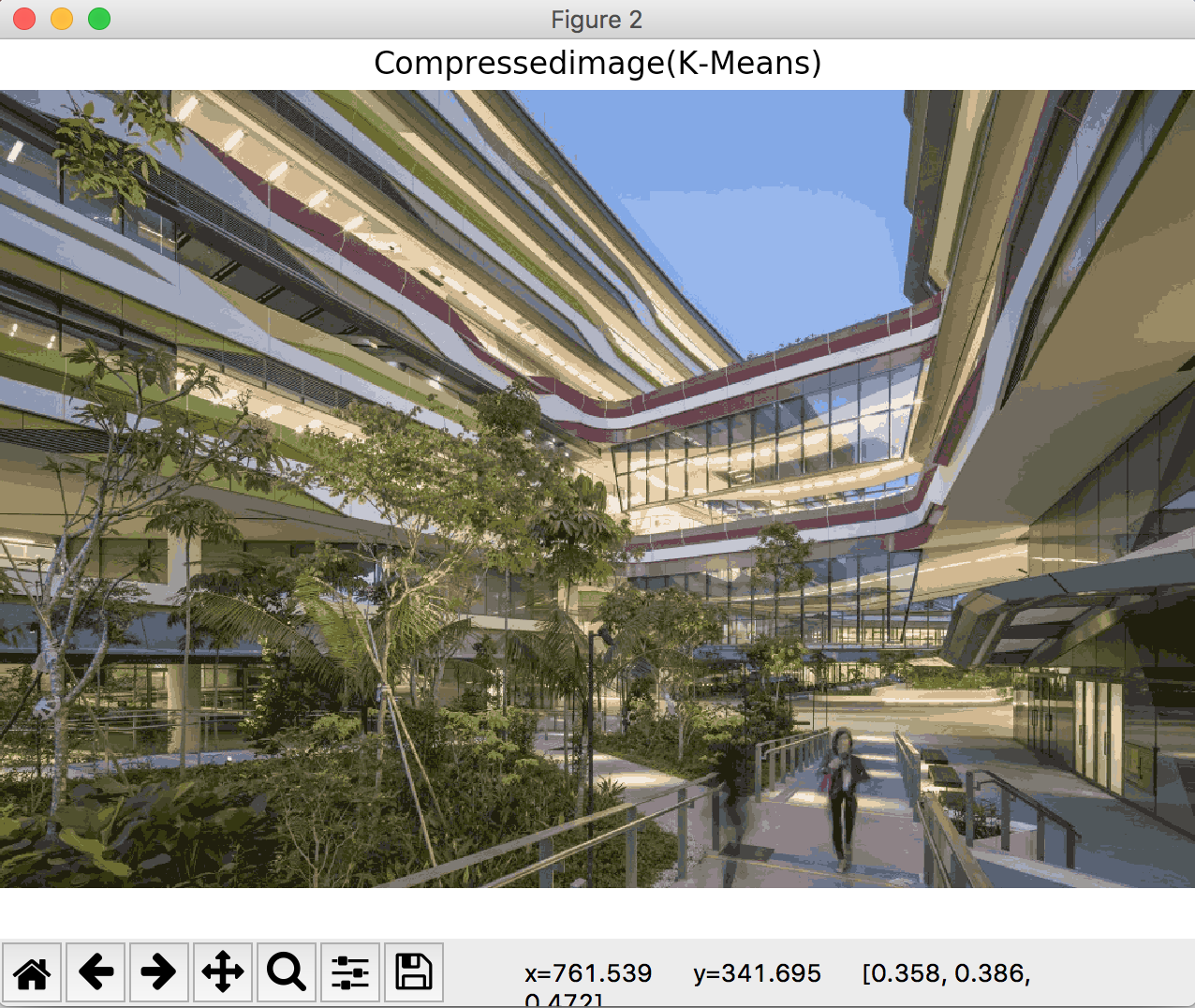


1. Plot relevant graphs:

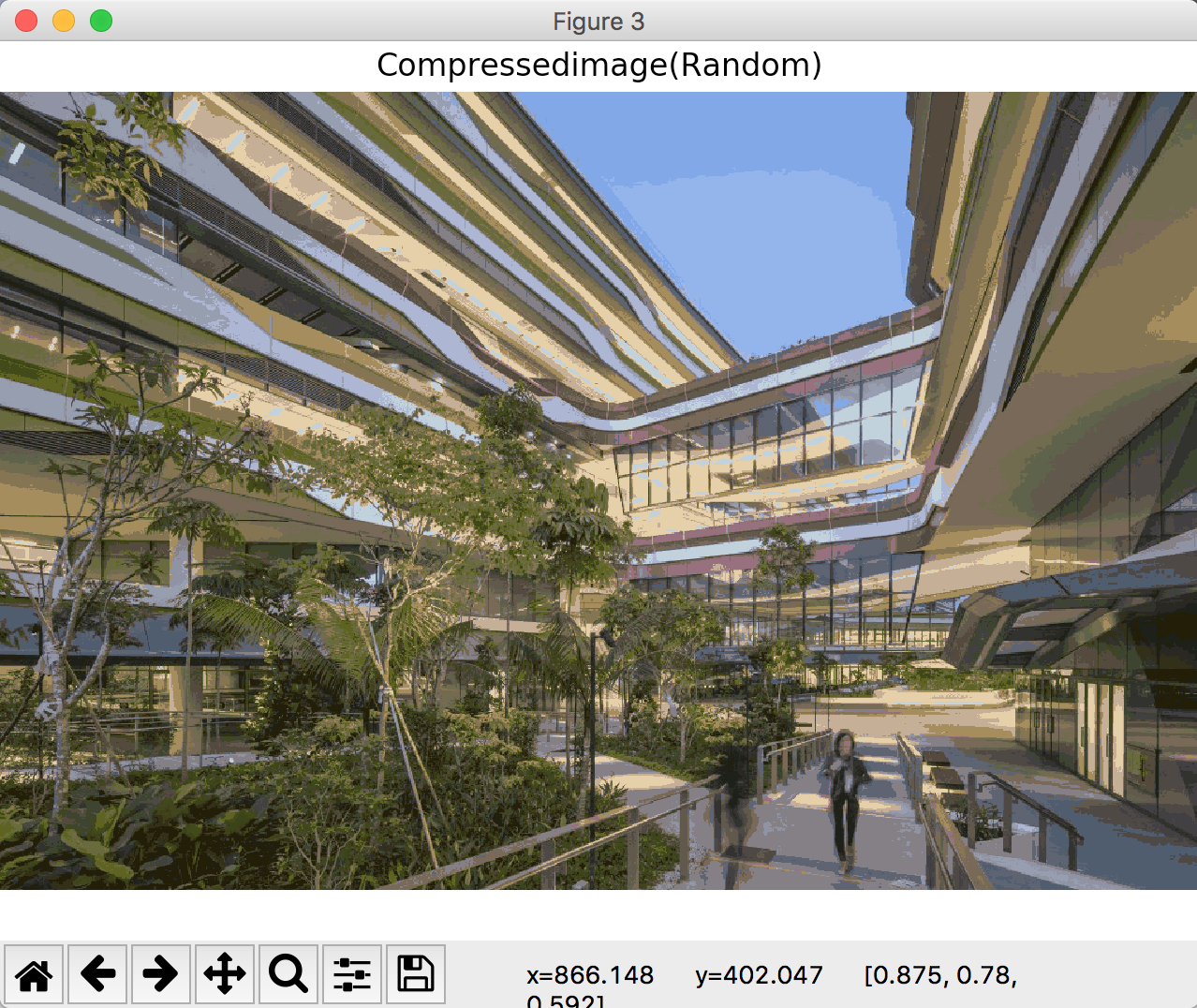
Plot the graph with the attributed computed above



1. Following is the graph output for kmeans



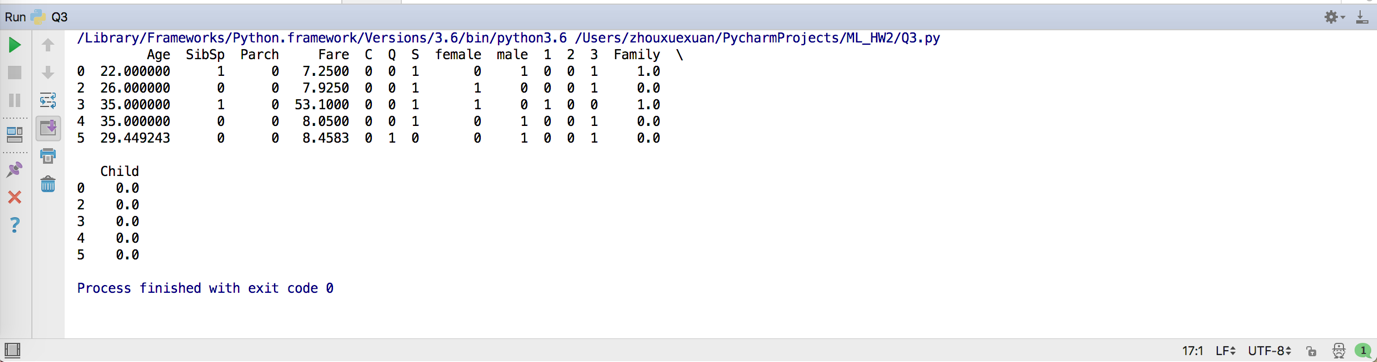
1. Following is the graph output for random

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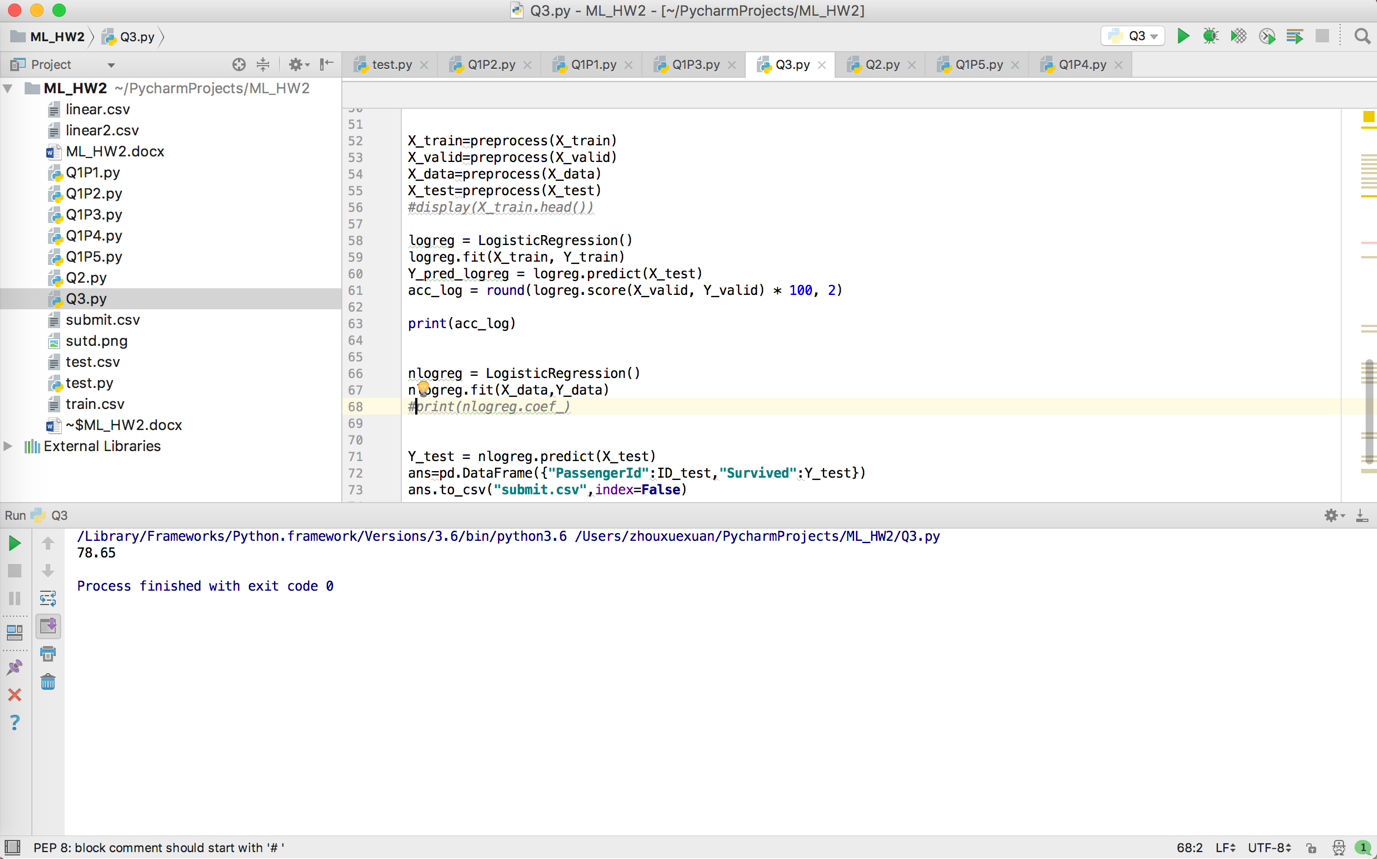
1. We can compute the derivative of the function to check the point when it goes into convergence(min)

**Q3.**

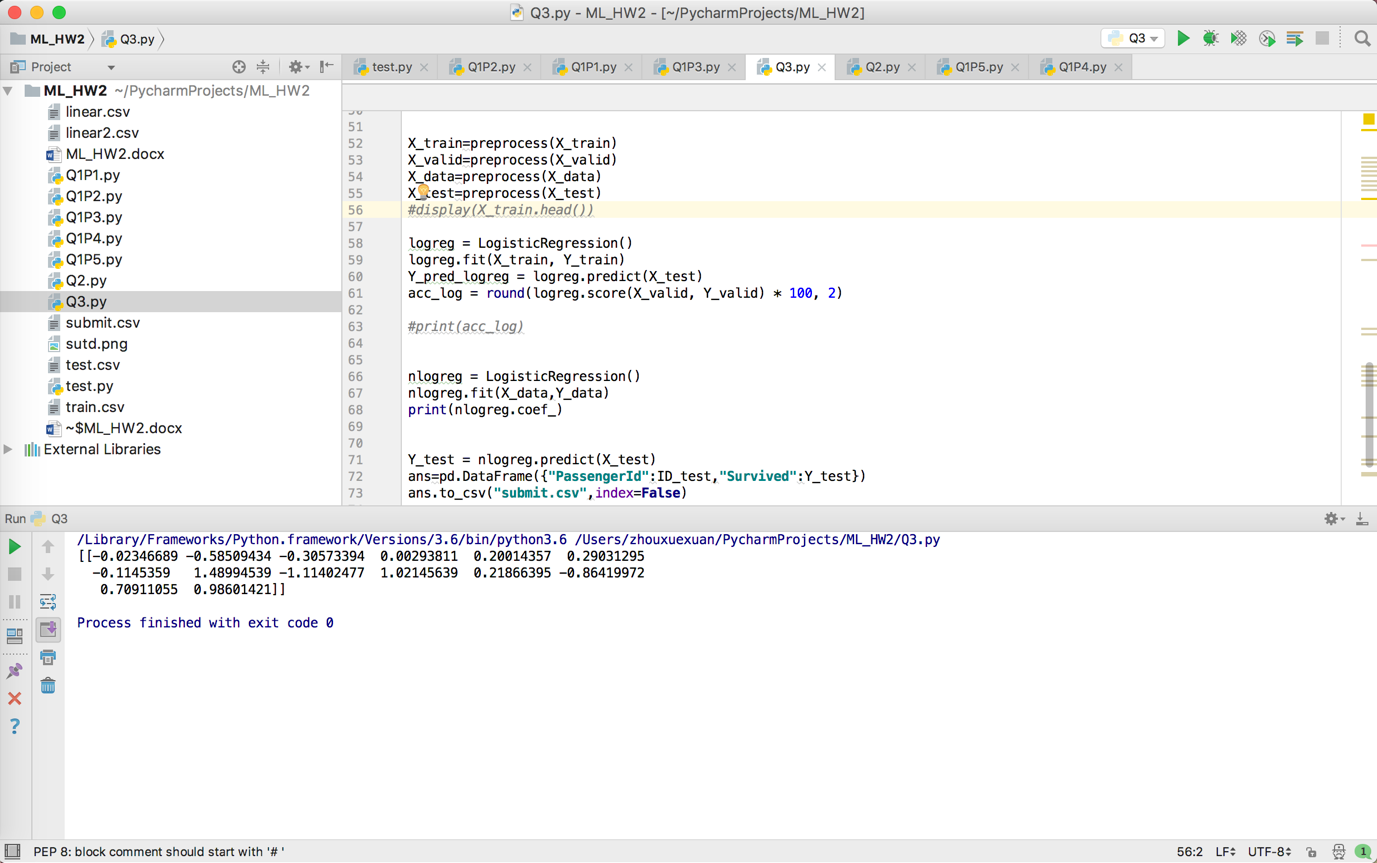
1. Out put shows below

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1. Score Output 78.65



1. Output parameter theata



1. User ID: 1303656

Score: 0.77511