



MITx 6.86x

Machine Learning with Python-From Linear Models to Deep Learning

[Help](#)

smitha\_kannur ▾

[Course](#)

[Progress](#)

[Dates](#)

[Discussion](#)

[Resources](#)

[Home](#) [Course](#) / [Unit 1 Linear Classifiers and Generalizations \(2 weeks\)](#) / [Project 1: Automatic Review Analyzer](#)

[< Previous](#)



[Next >](#)

## 5. Algorithm Discussion

[Bookmark this page](#)

Project due Oct 7, 2020 05:29 IST *Completed*

Once you have completed the implementation of the 3 learning algorithms, you should qualitatively verify your implementations. In **main.py** we have included a block of code that you should uncomment. This code loads a 2D dataset from **toy\_data.txt**, and trains your models using  $T = 10$ ,  $\lambda = 0.2$ . **main.py** will compute  $\theta$  and  $\theta_0$  for each of the learning algorithms that you have written. Then, it will call **plot\_toy\_data** to plot the resulting model and boundary.

## Plots

6.0/6 points (graded)

In order to verify your plots, please enter the values of  $\theta$  and  $\theta_0$  for all three algorithms.

(For example, if  $\theta = (1, 0.5)$ , then type **1, 0.5** without the brackets. Make sure your answers are correct up to 4 decimal places.)

For the **perceptron** algorithm:

$\theta =$   ✓ Answer: 3.9173999999999918, 4.164000000000001  $\theta_0 =$   
 ✓ Answer: -8.0

For the **average perceptron** algorithm:

$\theta =$   ✓ Answer: 3.478260499999999, 3.611060999999974  $\theta_0 =$   
 ✓ Answer: -6.373

For the **Pegasos** algorithm:

$\theta =$   ✓ Answer: 0.7346463119064065, 0.6300224592973831  $\theta_0 =$   
 ✓ Answer: -1.2195071848898564

Submit

You have used 1 of 20 attempts

**i** Answers are displayed within the problem

## Convergence

1/1 point (graded)

Since you have implemented three different learning algorithm for linear classifier, it is interesting to investigate which algorithm would actually converge. Please run it with a larger number of iterations  $T$  to see whether the algorithm would visually converge. You may also check whether the parameter in your theta converge in the first decimal place. Achieving convergence in longer decimal requires longer iterations, but the conclusion should be the same.

Which of the following algorithm will converge on this dataset? (Choose all that apply.)

☐ perceptron algorithm

☒ average perceptron algorithm

☒ pegasos algorithm



### Solution:

- Perceptron algorithm will not converge if the data is not linear separable.
- Average perceptron algorithm is stable due to averaging repeated solutions of perceptron outputs.
- Pegasos algorithm can find the optimal decision boundary for hinge loss.

Submit

You have used 1 of 3 attempts

**i** Answers are displayed within the problem

## Discussion

Hide Discussion

**Topic:** Unit 1 Linear Classifiers and Generalizations (2 weeks):Project 1: Automatic Review Analyzer / 5. Algorithm Discussion

Add a Post

Show all posts	by recent activity
<a href="#">No module named project1</a>	3
Everytime I try to run main.py I get the following error: No module named project1 and No module named utils. Can anyone help m...	
<a href="#">Visualizing convergence</a>	11
<a href="#">values of theta and theta_0 are different from that of grader's</a>	7
I am using google colab to run my .py files. I have amended the project1.py files with the required codes for each functions which ar...	
<a href="#">Overflow error for average perceptron</a>	8
I am getting an overflow error in Python when running the average perceptron, even though I passed the previous parts. RuntimeW	
<a href="#">@STAFF "Could not format HTML for problem. Contact course staff in the discussion forum for assistance."</a>	3
Please, I want to submit my answer and I have that problem	
<a href="#">TypeError: cannot unpack non-iterable NoneType object</a>	1
TypeError: cannot unpack non-iterable NoneType object Anyone facing the same issue? Could you please let me know what is the m...	
<a href="#">Could not format HTML for problem. Contact course staff in the discussion forum for assistance.</a>	1
staff please help :))	
<a href="#">[STAFF] Could not format HTML for problem. Contact course staff in the discussion forum for assistance.</a>	3
Please, help me and sort this out.	
<a href="#">Tip to Everyone</a>	14
All my algorithms were generating invalid theta and theta_0 values when executed inside Pycharm, when running directly through t...	
<a href="#">Two out of 6 is incorrect</a>	7
How is it possible, that two answers are wrong, after I passed all the test in previous questions. I have no idea what might be wrong,...	
<a href="#">Tip: open this page in mozilla / safari</a>	1
Chrome seemed to have been the problem for html formatting	
<a href="#">What else could I do?</a>	16
Guys, What I tried: - I got graded all correct from problem 2 to 4 - I tried implementing the epsilon checks for 0 (Perceptron single) an...	
Community TA	
<a href="#">int vs. float</a>	1
In one of my functions, I had the following statement: theta *= factor which I think is very clear, i.e. "multiply everything in the array t...	

< Previous

Next >

© All Rights Reserved



## edX

[About](#)

[Affiliates](#)

[edX for Business](#)

[Open edX](#)

[Careers](#)

[News](#)

## Legal

[Terms of Service & Honor Code](#)

[Privacy Policy](#)

[Accessibility Policy](#)

[Trademark Policy](#)

[Sitemap](#)

## Connect

[Blog](#)

[Contact Us](#)

[Help Center](#)

[Media Kit](#)

[Donate](#)



© 2020 edX Inc. All rights reserved.

深圳市恒宇博科技有限公司 [粤ICP备17044299号-2](#)