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Machine Learning with Python-From Linear Models to Deep Learning





sandipan_dey

Unit 2 Nonlinear Classification, <u>Linear regression, Collaborative</u> <u>Course</u> > <u>Filtering (2 weeks)</u>

> <u>Project 2: Digit recognition (Part 1)</u> > 6. Changing Labels

6. Changing Labels

We now wish to classify the digits by their (mod 3) value, such that the new label $y^{(i)}$ of sample i is the old $y^{(i)} \pmod 3$. (Reminder: Return the temp parameter to be 1 if you changed it for the last section)

You will be working in the file part1/main.py and part1/softmax.py in this problem

Using the Current Model - update target

3.0/3.0 points (graded)

Given that we already classified every $x^{(i)}$ as a digit, we could use the model we already trained and just calculate our estimations (mod 3).

Implement update_y function, which changes the old digit labels for the training and test set for the new (mod 3) labels.

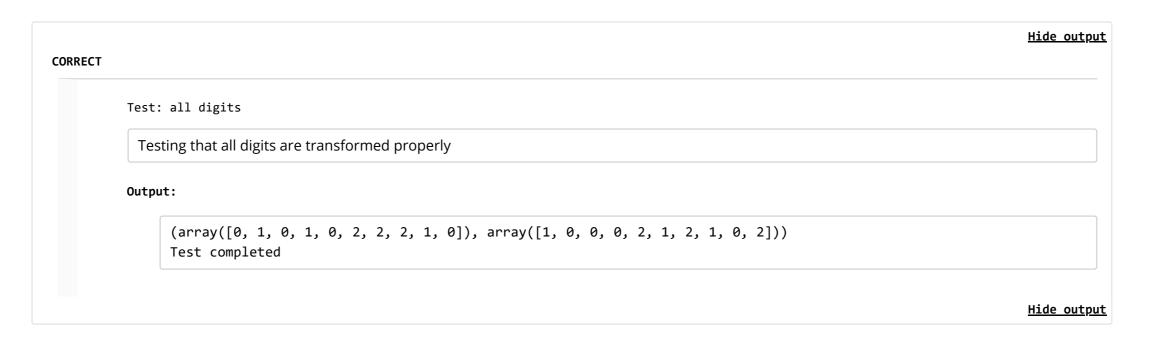
Available Functions: You have access to the NumPy python library as Inp

```
1 def update_y(train_y, test_y):
2
      Changes the old digit labels for the training and test set for the new (mod 3)
      labels.
5
      Args:
7
          train_y - (n, ) NumPy array containing the labels (a number between 0-9)
                   for each datapoint in the training set
          test_y - (n, ) NumPy array containing the labels (a number between 0-9)
10
                  for each datapoint in the test set
11
12
      Returns:
13
          train_y_mod3 - (n, ) NumPy array containing the new labels (a number between 0-2)
14
                       for each datapoint in the training set
15
          test_y_mod3 - (n, ) NumPy array containing the new labels (a number between 0-2)
                       for each datamoint in the test set
```

Press ESC then TAB or click outside of the code editor to exit

Correct

Test results



Submit

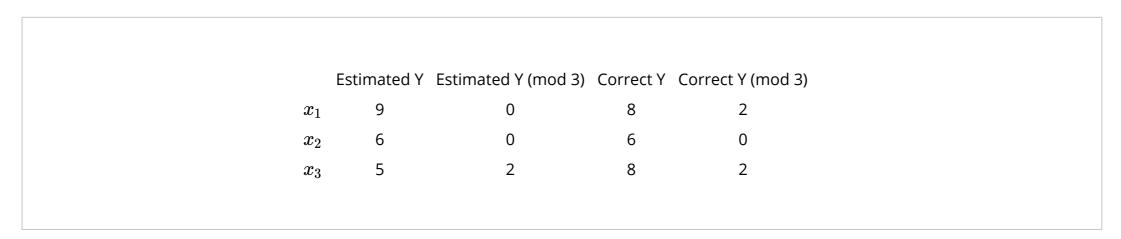
You have used 1 of 20 attempts

Using the Current Model - compute test error

3.0/3.0 points (graded)

Implement compute_test_error_mod3 function, which takes the test points X, their correct labels Y (digits (mod 3) from 0-2), theta, and the temp_parameter, and returns the error.

Example:



The error of the regression with the original labels would be 0.66667

However, the error of the regression when comparing the (mod 3) of the labels would be 0.33333

Available Functions: You have access to the NumPy python library as np and to the get_classification function from the project release

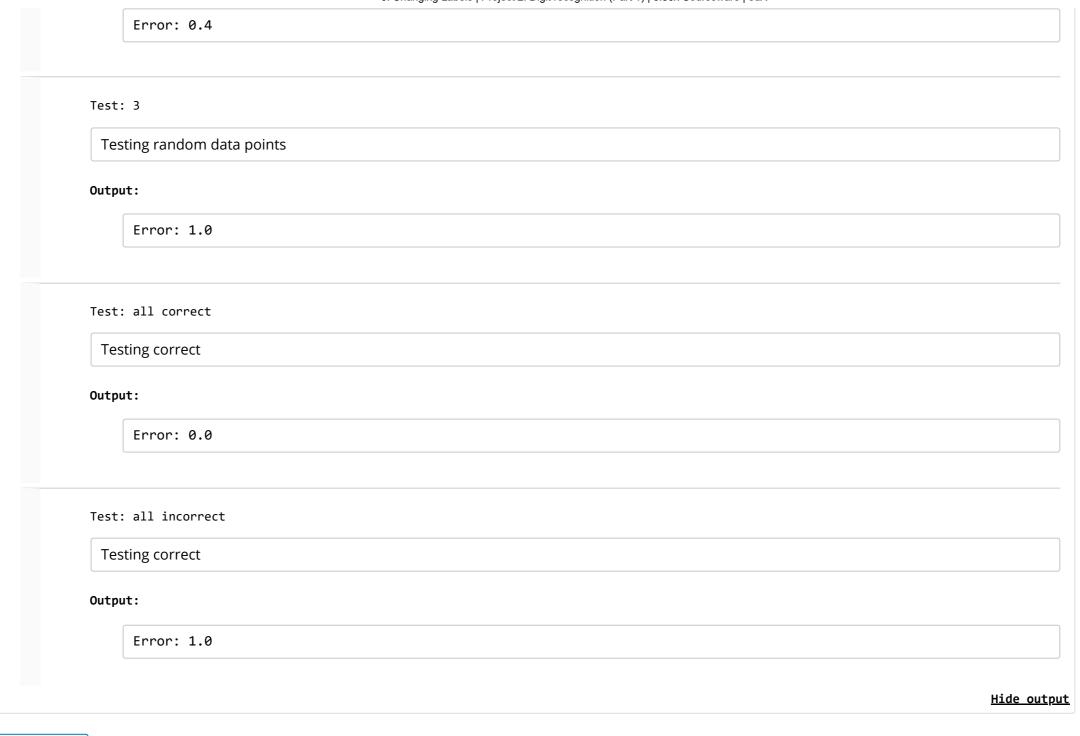
```
1 def compute_test_error_mod3(X, Y, theta, temp_parameter):
2
3
      Returns the error of these new labels when the classifier predicts the digit. (mod 3)
4
      Args:
6
          X - (n, d - 1) NumPy array (n datapoints each with d - 1 features)
          Y - (n, ) NumPy array containing the labels (a number from 0-2) for each
8
              data point
9
          theta - (k, d) NumPy array, where row j represents the parameters of our
10
                  model for label j
11
          temp parameter - the temperature parameter of softmax function (scalar)
12
13
      Returns:
14
          test error - the error rate of the classifier (scalar)
15
      #VOLIR CODE HERE
```

Press ESC then TAB or click outside of the code editor to exit

Correct

Test results





Submit

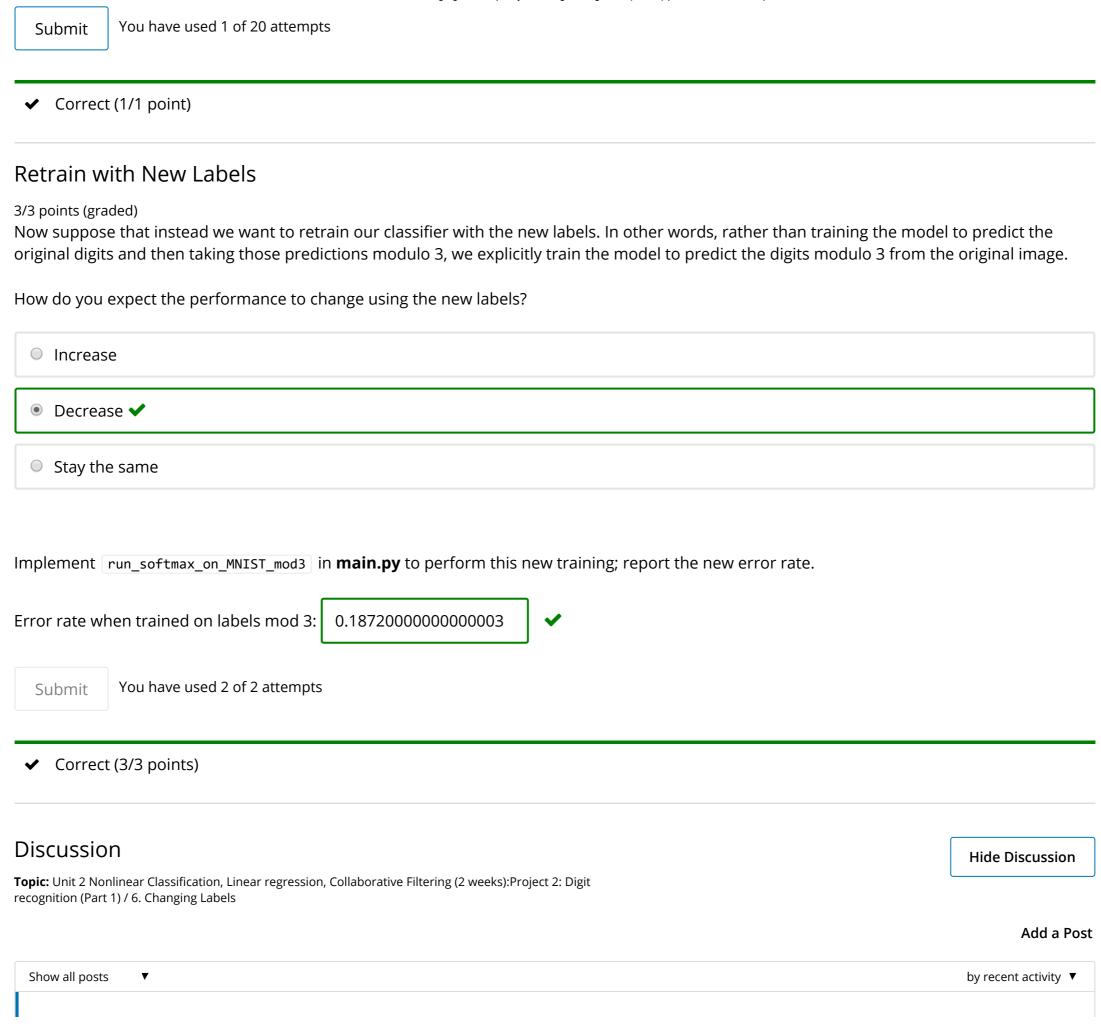
You have used 2 of 20 attempts

Using the Current Model - test error

1/1 point (graded)

Find the error rate of the new labels (call these two functions at the end of run_softmax_on_MNIST). See the functions' documentation for detailed explanations of the inputs and outputs.

Error rate for labels mod 3: 0.0767999999999999



?	<u>Using the Current Model - compute test error</u> The function `get classification` returns an np array of numbers between 0 and 9. We can't call update y in the function compute test error mod3. That means we should w	15
?	<u>Using the Current Model - update target</u> <u>We're supposed to relabel the original data set (numbers between 0 and 9) to a new data set (numbers between 0 and 2) according to what rule ??</u>	7
2	(mod 3) value Can you clarify what does it mean the mod 3 value?. Not sure this was explained before?	3
2	Regarding recommendation algorithms. More classes in terms of information theory, less entropy? Does anyone understand in terms of information theory, what does it mean to have more or less classes? Do more classes always represent more knowledge about the class	2
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