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Machine Learning with Python-From Linear Models to Deep Learning

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7. Classification and Accuracy

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Project due Mar 1, 2023 08:59 -03 Completed

Now we need a way to actually use our model to classify the data points. In this section we will learn a way to classify the data points using your model parameters, and then measure the accuracy.

Classification

1.0/1 point (graded)

Implement a classification function that uses θ and θ_0 to classify a set of data points. You will be given a matrix, θ , and θ_0 as defined in previous sections. This function should return a numpy array of 1s and -1s. If a prediction is **greater than** zero, it should be considered a positive classification.

Available Functions: You have access to the NumPy python library as `np`.

Tip:: As in previous exercises, when x is a float, " $x = 0$ " should be checked with $|x| < 10^{-6}$.

```
1 def classify(feature_matrix, theta, theta_0):
2     """
3     A classification function that uses theta and theta_0 to classify a set of
4     data points.
5     Args:
6         feature_matrix - A numpy matrix describing the given data. Each row
7         represents a single data point.
8         theta - A numpy array describing the linear classifier.
9         theta_0 - A real valued number representing the offset parameter.
10    Returns: A numpy array of 1s and -1s where the kth element of the array
11    is the predicted classification of the kth row of the feature matrix using
12    given theta and theta_0. If a prediction is GREATER THAN zero, it should
13    be considered a positive classification.
14    """
15
```

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

Correct

Test results

CORRECT

Submit

You have used 2 of 25 attempts

The `classifier_accuracy` function should take 6 arguments.

- a classifier function that, itself, takes arguments `(feature_matrix, labels, **kwargs)`
- the training feature matrix
- the validation feature matrix
- the training labels
- the validation labels
- a `**kwargs` argument to be passed to the classifier function

This function should train the given classifier using the training data and then compute classification accuracy on both the train and validation data. The return values should be a tuple where the first value is the training accuracy and the second value is the validation accuracy.

Implement classifier accuracy in the coding box below:

Available Functions: You have access to the NumPy python library as `np`, to `classifier` already implemented and to `accuracy` which we defined above.

```
1 def classifier_accuracy(  
2     classifier,  
3     train_feature_matrix,  
4     val_feature_matrix,  
5     train_labels,  
6     val_labels,  
7     **kwargs):  
8     """  
9     Trains a linear classifier and computes accuracy. The classifier is  
10    trained on the train data. The classifier's accuracy on the train  
11    validation data is then returned.  
12  
13    Args:  
14        `classifier` - A learning function that takes arguments  
15        (feature matrix, labels, **kwargs) and returns (the
```

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

Correct

Test results

CORRECT



Please enter the **validation accuracy** of your Pegasos algorithm.



You have used 3 of 20 attempts

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Topic: Unit 1. Linear Classifiers and Generalizations (2 weeks):Project 1: Automatic Review Analyzer / 7. Classification and Accuracy



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