```
1 # Important note: you do not have to modify this file for your homework.
  def calc_grad(X, Y, theta):
    """Compute the gradient
    count, = Y
 3 import util
                                   nford.edu - Dec 9, 2021, 3:32:44 PM PST
       """Compute the gradient of the loss with respect to theta."""
 8
 9
10
11
       probs = 1. / (1 + np.exp(-X.dot(theta)))
12
       grad = (Y - probs).dot(X)
13
14
       return grad
15
16
17
   def logistic_regression(X, Y):
       """Train a logistic regression model."""
18
19
       theta = np.zeros(X.shape[1])
20
       learning_rate = 0.1
21
22
       i = 0
23
       while True:
24
           i += 1
25
           prev_theta = theta
26
           grad = calc_grad(X, Y, theta)
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27
           theta = theta + learning_rate * grad
28
           if i % 10000 == 0:
29
               print('Finished %d iterations' % i)
30
           if np.linalg.norm(prev_theta - theta) < 1e-15:</pre>
31
             print('Converged in %d iterations' % i)
32
               break
33
       return
34
35
36 def main():
37
       print('==== Training model on data set A ====')
       Xa, Ya = util.load_csv('ds1_a.csv', add_intercept=True)
38
39
       logistic_regression(Xa, Ya)
40
       print('\n==== Training model on data set B ====')
41
                           vgPatel1@std
       Xb, Yb = util.load_csv('ds1_b.csv', add_intercept=True)
42
43
       logistic_regression(Xb, Yb)
44
45
46 if __name__ == '__main__':
```

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main()

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