Logistic Regression with a Neural Network mindset(Week 5)

Total points 100/100

Greetings from Consulting and Analytics Club, IIT Guwahati.

We hope you had an amazing learning experience until now.

This is the graded assignment for Week 5 on Neural Networks

Welcome to the first (required) programming exercise of the deep learning specialization.
In this notebook you will build your first image recognition algorithm.
You will build a cat classifier that recognizes cats with decent accuracy!

By completing this assignment you will:

- Work with logistic regression in a way that builds intuition relevant to neural networks.

- Learn how to minimize the cost function.

- Understand how derivatives of the cost are used to update parameters.

First we implement all the individual functions, then join them together to make the final "model" functions which will classify the input dataset.

Find the required dataset in the following drive link:
https://drive.google.com/drive/folders/1sfQoSgy6FX-Y1ETJAOBnbwyBXBcx1HZ2?usp=sharing

General Guidelines:
1) We recommend you to download the data set from the link above and perform analysis in your respective Jupyter Notebooks, to answer the questions given below.
2) All questions are compulsory and thus should be attempted.
3) Each Question has weightage and will contribute to the final grading of the course.
4) Please attempt this if you have completed all the 6 days of Week 5.
5) Violation of the honor code will lead to harsh actions being taken.

100 of 100 points

Quiz Questions

Answer the following questions after attempting the assignment in your Jupyter notbeooks

Implement the "propogate" function and answer the following questions.

Given w, b, X, Y = np.array([[1.],[2.]]), 2., np.array([[1.,2.,-1.],[3.,4.,-3.2]]), np.array([[1,0,1]])

✓ dw * 10/10

- ○ [[0.62845601] [2.39507239]]
- ◉ [[0.99845601] [2.39507239]] ✓
- ○ [[1.99845601] [0.39507239]]
- ○ [[0.59845601] [6.39507239]]

✓ db * 10/10

- ☐ 1.737594853
- ☑ 0.00145557813678 ✓
- ☐ 0.00000023784
- ☐ 0.57837597

✓ cost * 10/10

- ○ 7.801545319394553
- ◉ 5.801545319394553 ✓
- ○ 10.801545319394553
- ○ 3.801545319394553

Implement the optimize function

Given w, b, X, Y = np.array([[1.],[2.]]), 2., np.array([[1.,2.,-1.],[3.,4.,-3.2]]), np.array([[1,0,1]])
num_iterations= 100, learning_rate = 0.009

✓ w * 10/10

- ○ [[0.7124579][0.43106775]]
- ○ [[1.7624579][2.43106775]]
- ○ [[0.0024579][0.67106775]]
- ◉ [[0.19033591][0.12259159]] ✓

✓ b * 10/10

- ○ 6.9253598300845747
- ○ 5.845874548
- ◉ 1.9253598300845747 ✓
- ○ 9.9894638338363836

✓ dw * 10/10

- (●) [[0.67752042][1.41625495]] ✓
- ( ) [[0.0087752042][0.41625495]]
- ( ) [[0.17752042][3.41625495]]
- ( ) [[0.997752042][1.98625495]]

✓ db * 10/10

- ( ) 4.65735475638447475
- ( ) 0.71945675454067652
- (●) 0.21919450454067652 ✓
- ( ) 1.12919450454066542

Implement Predict function

Given w = np.array([[0.1124579],[0.23106775]])
b = -0.3
X = np.array([[1.,-1.1,-3.2],[1.2,2.,0.1]])

✓ Print the predictions * 10/10

- (●) [[1. 1. 0.]] ✓
- ( ) [[1. 1. 1.]]
- ( ) [[1. 0. 0.]]
- ( ) [[0. 1. 0.]]

Implement the model function

Given parameters (train_set_x, train_set_y, test_set_x, test_set_y, num_iterations = 2000, learning_rate = 0.005, print_cost = True)

✓ Find the cost after 1900th iteration * 10/10

- ○ 0.214820
- ○ 0.067589
- ◉ 0.140872 ✓
- ○ 0.689472

✓ What is the test accuracy? * 10/10

- ○ 85%
- ○ 66%
- ◉ 70% ✓
- ○ 81%

BEFORE SUBMITTING

The next page will lead you to accept the honor code and submit the User ID and Password. Make sure you have these ready.

THE USER ID AND PASSWORD FOR ALL QUIZZES/ASSIGNMENTS IS SAME THROUGHOUT COURSE

General Instructions 0 of 0 points

Please fill up all the relevant details provided to you.

You are allowed only ONE submission per one slack account, hence click the submit button wisely only after re-checking your answers.

Honor Code

1) You can submit the form only once, using a single User ID and Pass. Usage of multiple accounts for submission of quizzes will lead to harsh actions being taken.

2) Your answers to the questions must be your own work. (Very Important)

3) You may not share your solutions with anyone else unless explicitly permitted by the mentor. This includes anything written by you, as well as any official solutions provided by the course .

4) You may not engage in any other activities that will dishonestly improve your results or dishonestly improve or damage the results of others.

You can report Honor Code violations by contacting any of the members of Consulting and Analytics Club, IIT Guwahati.

Please Enter your Name *

Dhrubanka Dutta

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dhrubanka.99dutta@gmail.com

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