

**EN.605.647.83.SP21 Neural Networks**

Course Modules    Module 5: The Feed-Forward, Back Propagation Algorithm

## Review Test Submission: Module 5 Programming Assignment

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Course	EN.605.647.81.SP21 Neural Networks
Test	Module 5 Programming Assignment
Started	2/25/21 7:12 PM
Submitted	2/25/21 7:14 PM
Due Date	3/2/21 11:59 PM
Status	Completed
Attempt Score	30 out of 40 points
Time Elapsed	1 minute
Results Displayed	Submitted Answers, Feedback, Incorrectly Answered Questions

**Question 1**

10 out of 10 points



Run your code to determine the initial activation function value (do not update the weights) using the following weights for each of two input values respectively: Weights are [0.24, 0.88]; Inputs are [0.8, 0.9], the desired output is 0.95, bias = 0 and eta = 5.0. What is the activation value after this iteration? Answer to 4 significant decimal digits.

Selected Answer: 0.7279

Response Feedback: You must have coded the Perceptron and Perceptron Delta Function correctly.

**Question 2**

0 out of 10 points



Now restart your program with the same initial conditions and perform 75 iterations. What is the activation function value now? Remember, this activation function value is computed *after* the 75th weight update. Again, answer to 4 significant decimal digits.

Selected Answer: 0.9420

Response Feedback: You will need to make sure you update the weights according to the Perceptron Delta Function.

**Question 3**

10 out of 10 points



For this question, use the same initial values as to inputs, weights, eta, but change the desired output to 0.15. Perform the Perceptron Delta Function to update the weights and do this for 30 iterations. What is the activation function value *after* the 30th iteration? Remember, each iteration encompasses updating the weights. Thus, the actual output must be based on the 30th weight update *after* which the inputs are fed forward thru the network to produce an activation function value. Answer to 4 decimal digits.

Selected Answer: 0.1521

**Question 4**

10 out of 10 points



One can consider the bias  $\theta$  as a weight with a corresponding input value fixed at 1. If we want to update this "weight", i.e., the bias, we can apply the same methodology in determining  $\frac{\partial E}{\partial \theta}$  in the Method of Steepest Descent (MOSD) when using the Sigmoid Activation function. If our Perceptron has a single input value of  $x = 2$  and an activation value of  $y = 0.3$  and desired output of 0.4, what is the value of  $\frac{\partial E}{\partial \theta}$ ?

To answer this correctly, derive the value of  $\frac{\partial E}{\partial \theta}$ . Answer to 3 significant decimal digits.

Selected Answer:     -.021

Response Feedback: Nice job. Keep this formula in mind for future assignments.

Thursday, February 25, 2021 7:14:19 PM EST

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