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EN.605.647.83.SP21 Neural Networks   Course Modules   Midterm Examination   Review Test Submission: Mid-Term Exam Part C

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User	BRIAN THOMAS LOUGHRAN
Course	EN.605.647.81.SP21 Neural Networks
Test	Mid-Term Exam Part C
Started	4/11/21 5:40 PM
Submitted	4/11/21 5:55 PM
Due Date	4/11/21 11:59 PM
Status	Completed
Attempt Score	Grade not available.
Time Elapsed	14 minutes out of 45 minutes
Results Displayed	Submitted Answers, Incorrectly Answered Questions

Question 1

5 out of 5 points

A Boltzmann Machine is diagrammed in P6:PR-A with the indicated node labels, weights and connections shown.   This is a very similar network in terms of architecture as a Hopfield network, except that it has only binary valued state variables (the states can be only 0 or 1) and the weights are not necessarily determined by exemplars but are symmetric, i.e., $W_{ij} = W_{ji}$. Assume there are no self-connections for each node. Using the weights given, and the fact that the current state vector is [1, 0, 1, 1] where each vector element index corresponds to the node label, what is the activation function value of node 2 if the activation function is the Sigmoid function? Hint: You can construct a weight matrix using the given weights to facilitate computation. Answer to 4 decimal digits.

Selected Answer: 0.1824

Question 2

0 out of 5 points

Using the Hecht-Nielsen function in P6:PR-B, what is the network energy value for the configuration state (1, 0, 1, 1)?

Selected Answer: 0.25

Question 3

5 out of 5 points

Given the following exemplars for a Binary Associative Memory where exemplar A_1 is associated with B_1 and so forth, determine the weight matrix using the following sets of exemplars. Assume the A vectors are column vectors.

$A^T_1 = [-1, -1, 1]$ $B_1 = [1, 1]$

$A^T_2 = [1, -1, -1]$ $B_2 = [-1, 1]$

The matrix entry for matrix element 1,1 is _?

Selected Answer: -2

Question 4

5 out of 5 points

The weight matrix entry in the BAM in problem 7a (problem 3) for matrix element 3,1 is

Selected Answer: 2

Question 5

5 out of 5 points

If a B vector [1, -1] is input to the weight matrix you obtained for the BAM you get a resulting 3 x 1 vector. After applying the hard-limiting function you get another vector with bipolar values. What is the sum of its elements?

Selected Answer: 1

Sunday, April 11, 2021 5:55:37 PM EDT

← **OK**