



Remaining Time: 42 minutes, 24 seconds.

Question Completion Status:

Test Information

Description

Instructions

Timed Test This test has a time limit of 45 minutes. This test will save and submit automatically when the time expires. Warnings appear when **half the time, 5 minutes, 1 minute, and 30 seconds** remain.

Multiple Attempts This test allows 3 attempts. This is attempt number 1.

Force Completion Once started, this test must be completed in one sitting. Do not leave the test before clicking **Save and Submit**.

QUESTION 1

5 points

Save Answer

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.

QUESTION 2

5 points

Save Answer

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

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Save All Answers

Save i

QUESTION 3**5 points**

Save Answer

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exemplars. Assume the A vectors are column vectors.

$$\mathbf{A}^T_1 = [-1, -1, 1] \quad \mathbf{B}_1 = [1, 1]$$

$$\mathbf{A}^T_2 = [1, -1, -1] \quad \mathbf{B}_2 = [-1, 1]$$

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

QUESTION 4**5 points**

Save Answer

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

QUESTION 5**5 points**

Save Answer

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?

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Save All Answers

Save i