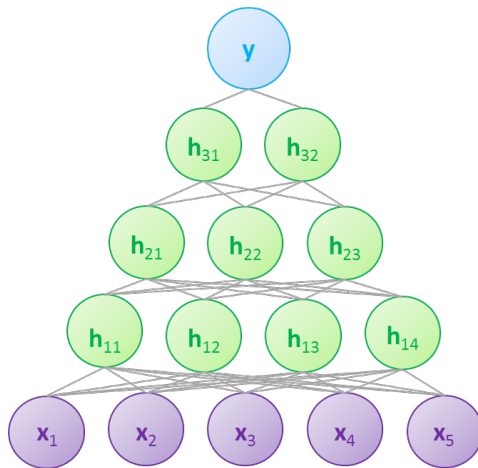


Name:

Use this neural network diagram to answer questions 1-4.



1. (1 pt.) What type (or architecture) of neural network is pictured in the diagram directly above?

Full credit must include: "MLP" or "Multilayer perceptron"

Partial credit for: deep neural network, DNN, feedforward network

2. (1 pt.) How many hidden layers does it have?

3

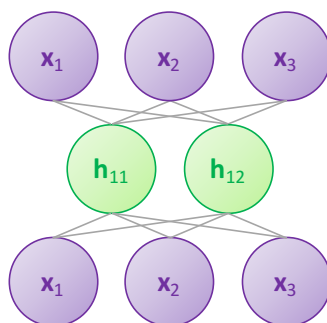
3. (1 pt.) How many hidden units does it have in total in all layers?

9

4. (1 pt.) (True/False) The type of neural network directly above is generally used for feature extraction, dimension reduction, data visualization, and anomaly detection.

False

Use this neural network diagram to answer question 5 - 6.



5. (1 pt.) What type (or architecture) of neural network is pictured in the diagram?

Full credit must include "autoencoder"

Name:

6. (1 pt.) (True/False) The type of neural network directly above is generally used for regression and classification tasks, especially in pattern recognition.

False

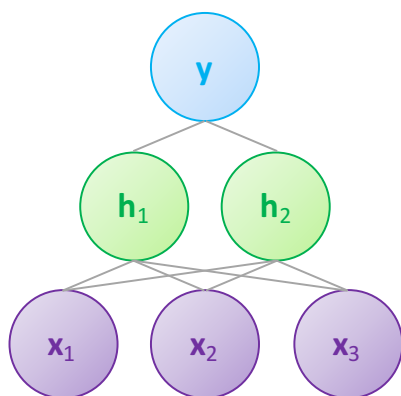
7. (1 pt.) (True/False) In general, it's difficult to generate meaningful interpretations of the weights or other attributes of a trained neural network model.

True

8. (1 pt.) (True/False) In general, variance is often increased in neural network predictions, allowing for lower training data error, by adding hidden units and training for more iterations.

True

Use this neural network diagram to answer question 9.



9. (2 pts.) Assuming a direct connection between the hidden layer and output unit (no weights, no bias, no activation function), and assuming  $\tanh()$  activation functions for standard hidden units, such that the full trained network is defined by the function:

$$y = \tanh(1 + 2 * x_1 + 3 * x_2 + 4 * x_3) + \tanh(5 + 6 * x_1 + 7 * x_2 + 8 * x_3)$$

What will this neural network predict for this row of new data?

$x_1$	$x_2$	$x_3$
9	10	11

(show your work)

$$\tanh(1 + 2*9 + 3*10 + 4*11) = 1$$

$$\tanh(5 + 6*9 + 7*10 + 8*11) = 1, 1+1 = \mathbf{2}$$

1 point for work

1 point for correct answer