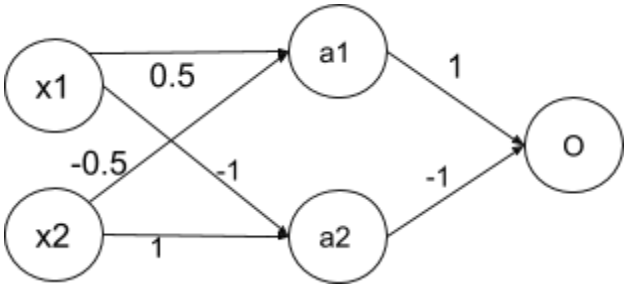
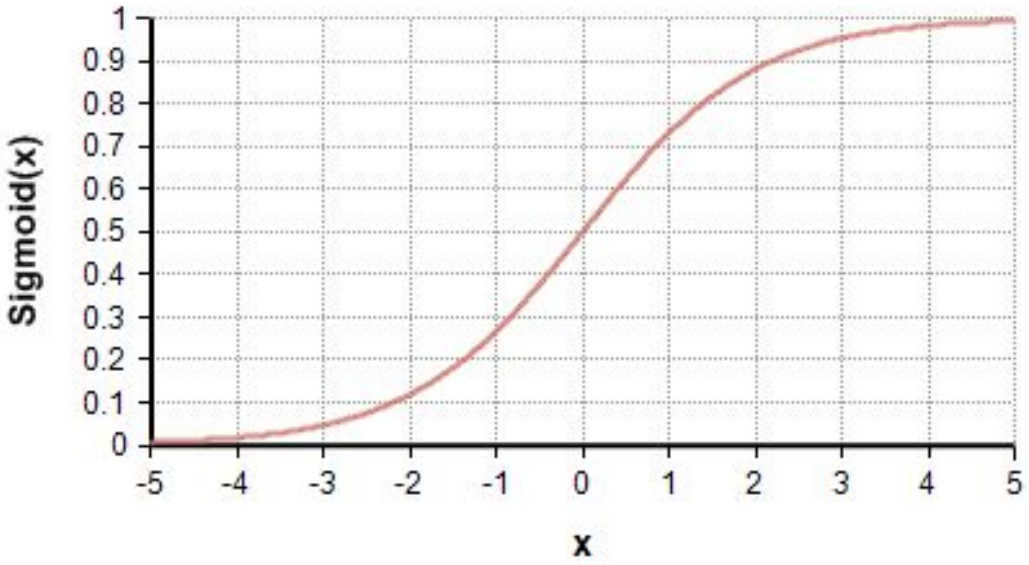
In Class Activity – Intro to Neural Networks (ICA 14) - Solutions

Please enter your responses to the questions at https://tinyurl.com/AIF19-ICA14

Consider the following neural network architecture, with weights being shown on the connections between nodes:



Node a1 has a bias of 1, a2 has a bias of -0.5, the output node O has a bias of 1.
We are using the **sigmoid** activation function for nodes a1, a2, and O as shown in the graph below.



Q1) What is the activation of the output node O for the input [x1, x2] = [1, 1].

Solution:
a1 = sigmoid(0.5 * x1 + (-0.5) * x2 + b_1) = sigmoid(0.5 + (-0.5) + 1) = sigmoid(1) ~ 0.7
a2 = sigmoid((-1)* x1 + 1 * x2 + b_2) = sigmoid((-1) + 1 + (-0.5)) = sigmoid(-0.5) ~ 0.4

O = sigmoid(1 * a1 + (-1) * a2 + b_o) = sigmoid(0.7 - 0.4 + 1) = sigmoid(1.3) ~ 0.8