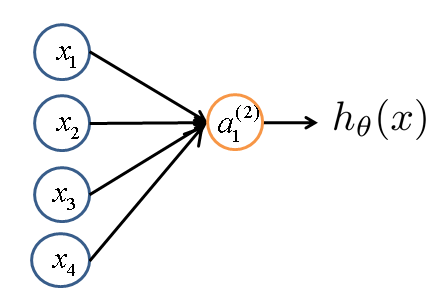
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| --- |
| **WQD7006**  **Machine Learning for Data Science**  **Multi-Layer Perceptron** |

1. Look at the following, which is a presentation of one unit of artificial neuron



1. The node has four inputs  that receive only binary signals (either 0 or 1). Determine how many different input patterns this node can receive?
2. Consider the unit shown in Figure 1 below. Suppose that the weights corresponding to the four inputs have the following values:



and the activation of the unit is given by the step-function:



Note:  “Activation” of unit *i* in layer *j*

Calculate what will be the output value y of the unit for each of the following input patterns:

|  |  |  |  |
| --- | --- | --- | --- |
| Pattern, *Pi* | *P1* | *P2* | *P3* |
| *X1* | *1* | *0* | *1* |
| *X2* | *0* | *1* | *0* |
| *X3* | *0* | *1* | *1* |
| *X4* | *1* | *1* | *1* |

# Part 2

Use Iris dataset (WEKA) to answer the rest of the questions.

1. Run MLP using 50 trainings (epochs). Report classification performance.

A close up of text on a white background

Description automatically generated

1. Draw the graphical representation of the network.

A screenshot of a cell phone

Description automatically generated

1. Change the learning rate to 1. Run the classification and comment on the results.

A screenshot of a cell phone

Description automatically generated

1. Play with the number of hidden layers, from 0 to 3. Note the differences in terms of performance (GUI- False)
2. Change hidden layer to 5, set to training instead of cross validation. Comment on result

A picture containing bird

Description automatically generated