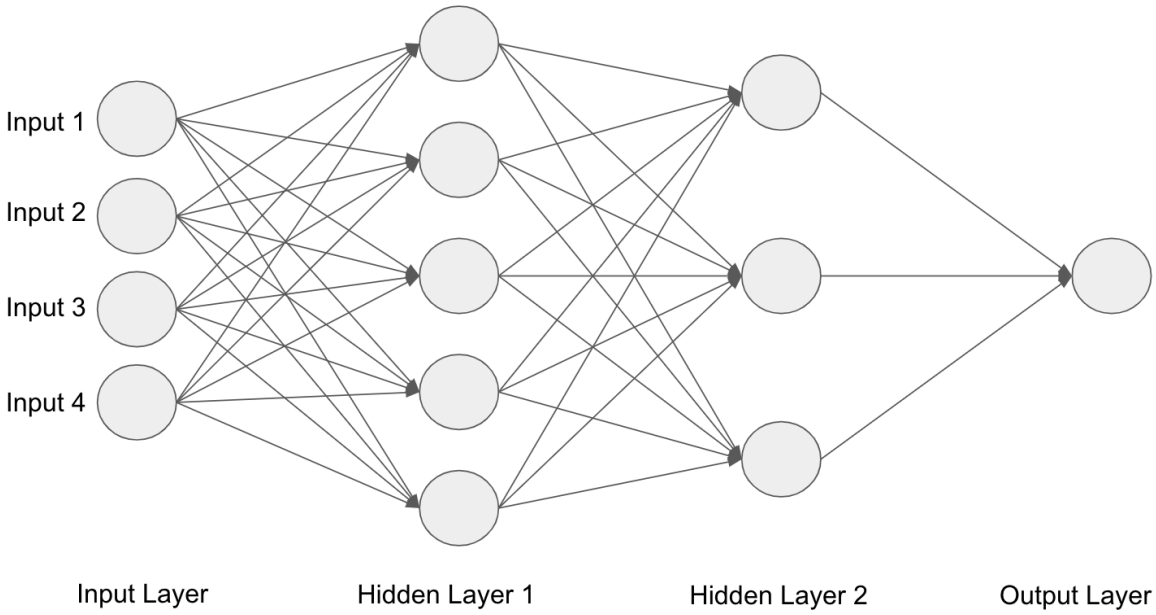
Assignment --- MODULE 8

1. Consider a four layer fully-connected (include input layer) network with n_1, n_2, n_3, n_4 neurons in four layers respectively. Input are fed into the first layer and represented by x, the loss is mean squared error E, and the activation function for each layer is sigmoid function $\frac{1}{1+e^{-x}}$. Let the label vector be t of size n_4 and let each layer output vector be y_i and the input for each layer be z_i, both of size n_i.



How many trainable parameters in this model (You don't need to consider the bias term in this exercise)

n_1 is the input layer where we have 4 inputs ($n_1 = 4$). n_2 is the first hidden layer containing 5 neurons ($n_2 = 5$) and the second hidden layer contains 3 neurons ($n_3 = 3$) and finally our output layer only containing 1 neuron ($n_4 = 1$). The number of parameters is equal to the product of each layer n_i. That is $(n_1 \times n_2) + (n_2 \times n_3) + (n_3 \times n_4) = number\ of\ parameters$. That is $(4 \times 5) + (5 \times 3) + (3 \times 1) = 38$ trainable parameters.

2. Fill out the code cells in hw_8_tf.ipynb to get yourself familiar with Tensorflow.

3. Go to the datasets folder and run the script get_datasets.sh to download cifar-10 dataset (for mac you can simply type "sh ./get_datasets.sh" to run the script). Fill out the code cells hw_8.ipynb.

Submit a .doc or .pdf with your written answers. Submit your Python notebook. Submit a PDF of your Python notebook.