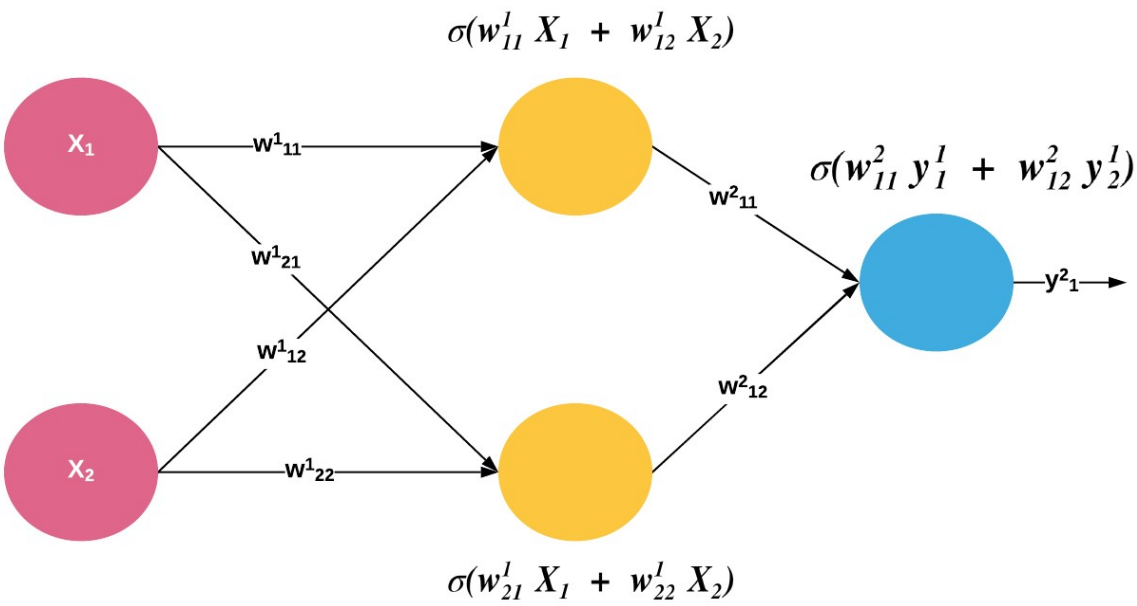
Homework 6

Exercise 1 (Back propagation) 6 points

Consider the simplest neural network explained in the lecture slides. In the slides, we have demonstrated how one could compute new values of weights using Backpropagation algorithm.

In this exercise, task is to estimate new values for weights $\mathbf{w^1}_{22}$ and $\mathbf{w^2}_{12}$. Use same settings as in the lecture i.e. **X** =[0, 1], **y** = [1], activation function = Sigmoid, step size η = 0.1



Exercise 2 (Computer vision) 4 points

1. The task in this exercise is to create a predictive model that can classify input 32 x 32 color image into one of 10 classes.

2. Open the file cifar10.py. This file comes from the example usages of Keras library. Get familiar with the contents of the file, in particular where the architecture of the deep neural network is defined.
3. Report on how labels for the images are represented for training of the deep neural network in cifar10.py.
4. Run training of the deep neural network with cifar10.py. Report the best validation accuracy you get. Is it better than the one with random guessing?
5. Set number of neurons in first fully connected layer of the network to 4. How does the validation error changes? Why do you think this happens? Write down answers to these questions into the report.