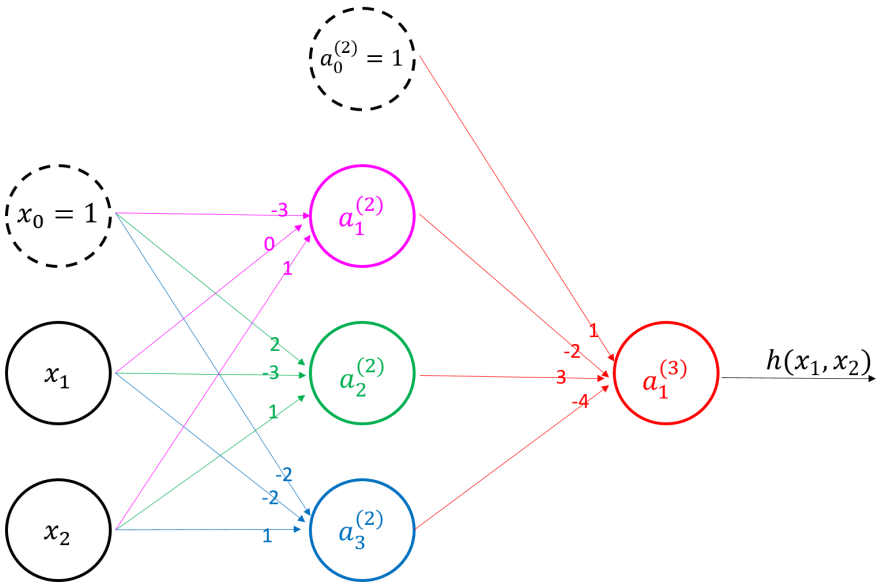
forward propagation for neural networks

Problem 1

Given the following neural network:



where $\Theta^{(1)} = \begin{bmatrix} \Theta_{10}^{(1)} = -3 & \Theta_{11}^{(1)} = 0 & \Theta_{12}^{(1)} = 1 \\ \Theta_{20}^{(1)} = 2 & \Theta_{21}^{(1)} = -3 & \Theta_{22}^{(1)} = 1 \\ \Theta_{30}^{(1)} = -2 & \Theta_{31}^{(1)} = -2 & \Theta_{32}^{(1)} = 1 \end{bmatrix}$,

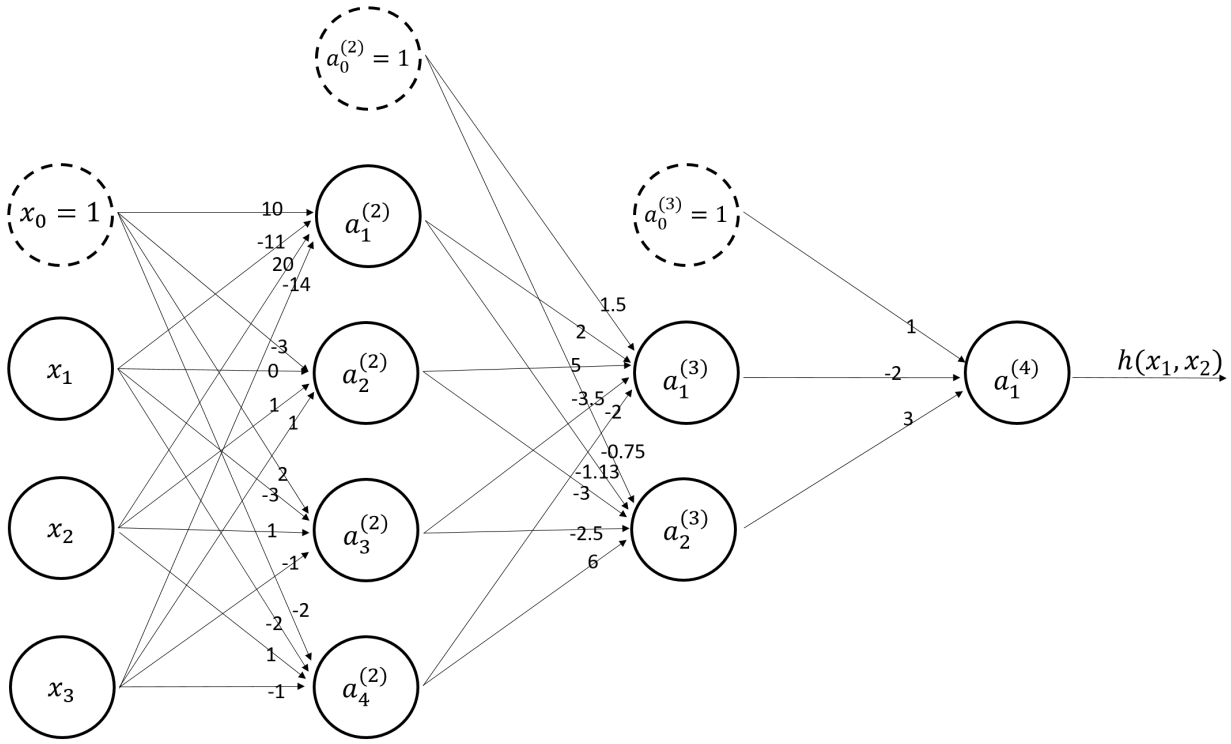
and $\Theta^{(2)} = \begin{bmatrix} \Theta_{10}^{(2)} = 1 & \Theta_{11}^{(2)} = -2 & \Theta_{12}^{(2)} = 3 & \Theta_{13}^{(2)} = -4 \end{bmatrix}$,

what is $h(x_1, x_2)$ value when $X = \begin{bmatrix} x_1 = 1 \\ x_2 = 2 \end{bmatrix}$?

note: X above consists of the features for only one point organized in vertical order. It has not been augmented with $x_0 = 1$ yet.

Problem 2

Given the following neural network:



where $\Theta^{(1)} = \begin{bmatrix} \Theta_{10}^{(1)} = 10 & \Theta_{11}^{(1)} = -11 & \Theta_{12}^{(1)} = 20 & \Theta_{13}^{(1)} = -14 \\ \Theta_{20}^{(1)} = -3 & \Theta_{21}^{(1)} = 0 & \Theta_{22}^{(1)} = 1 & \Theta_{23}^{(1)} = 1 \\ \Theta_{30}^{(1)} = 2 & \Theta_{31}^{(1)} = -3 & \Theta_{32}^{(1)} = 1 & \Theta_{33}^{(1)} = -1 \\ \Theta_{40}^{(1)} = -2 & \Theta_{41}^{(1)} = -2 & \Theta_{42}^{(1)} = 1 & \Theta_{43}^{(1)} = -1 \end{bmatrix}$,

and $\Theta^{(2)} = \begin{bmatrix} \Theta_{10}^{(2)} = 1.5 & \Theta_{11}^{(2)} = 2 & \Theta_{12}^{(2)} = 5 & \Theta_{13}^{(2)} = -3.5 & \Theta_{14}^{(2)} = -2 \\ \Theta_{20}^{(2)} = -0.75 & \Theta_{21}^{(2)} = -1.13 & \Theta_{22}^{(2)} = -3 & \Theta_{23}^{(2)} = -2.5 & \Theta_{24}^{(2)} = 6 \end{bmatrix}$,

and $\Theta^{(3)} = \begin{bmatrix} \Theta_{10}^{(3)} = 1 & \Theta_{11}^{(3)} = -2 & \Theta_{12}^{(3)} = 3 \end{bmatrix}$,

what are $h(x_1, x_2)$ values when $X = \begin{bmatrix} x_1^{(1)} = 1 & x_1^{(2)} = -1 \\ x_2^{(1)} = 2 & x_2^{(2)} = -4 \\ x_3^{(1)} = 3 & x_3^{(2)} = 2 \end{bmatrix}$?

note: X above consists of the features for two points organized in vertical order. It has not been augmented with $x_0 = 1$ yet.
