## The Feedforward Process- Finding $\vec{y}$

We finished our first step, finding $\vec{h}$, and now need to find the output $\vec{y}$

As you've seen in the video above, the process of calculating the output vector is mathematically similar to that of calculating the vector of the hidden layer. We use, again, a vector by matrix multiplication. The vector is the newly calculated hidden layer and the matrix is the one connecting the hidden layer to the output.
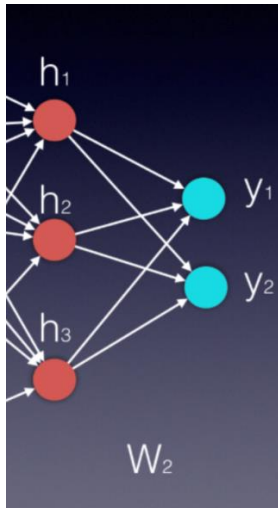
Essentially, each new layer in a neural network is calculated by a vector by matrix multiplication, where the vector represents the inputs to the new layer and the matrix is the one connecting these new inputs to the next layer.

In our example, the input vector is $\vec{h}$ and the matrix is W^2, therefore $\vec{y} = \vec{h}W^2$

$$\begin{bmatrix} y_1 & y_2 \end{bmatrix} = \begin{bmatrix} h_1 & h_2 & h_3 \end{bmatrix} \begin{bmatrix} w_{11} & w_{12} \\ w_{21} & w_{22} \\ w_{31} & w_{32} \end{bmatrix}$$

Equation 19

The video above also generalizes the model we have been talking about.

More on this issue in out next module **Neural Networks**!.