

Convolution Neural Network Course Notes:

Loss functions



Loss Functions

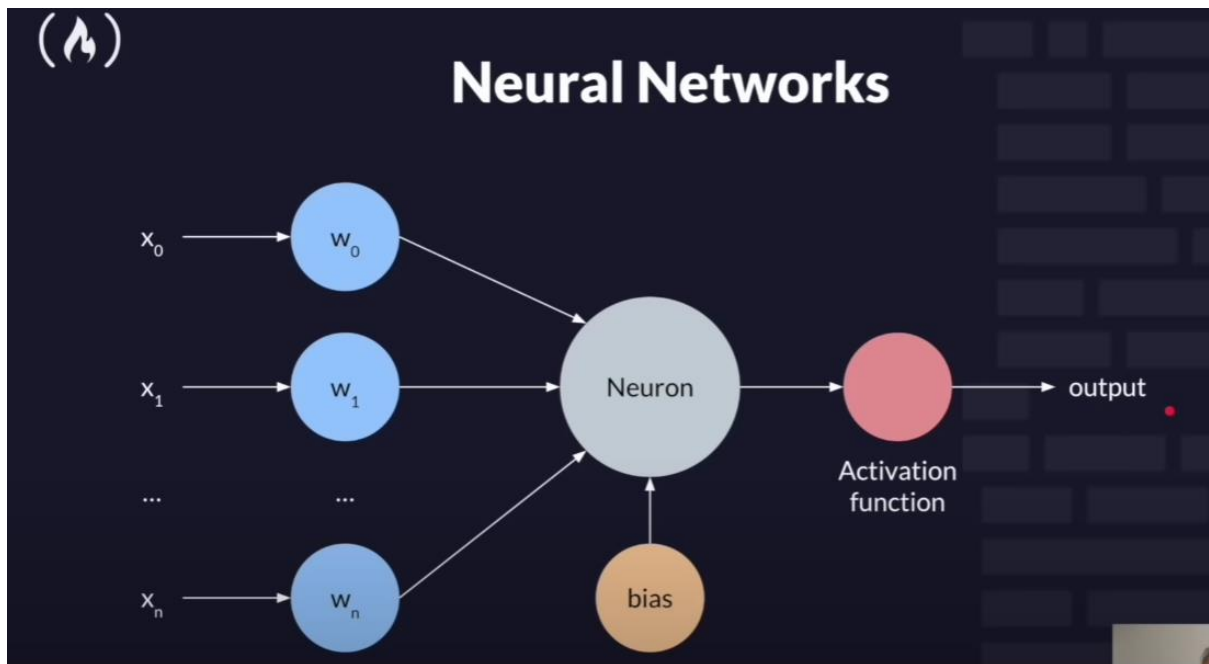
Binary Cross-Entropy Loss

$$H_p(q) = -\frac{1}{N} \sum_{i=1}^N y_i \cdot \log(p(y_i)) + (1 - y_i) \cdot \log(1 - p(y_i))$$

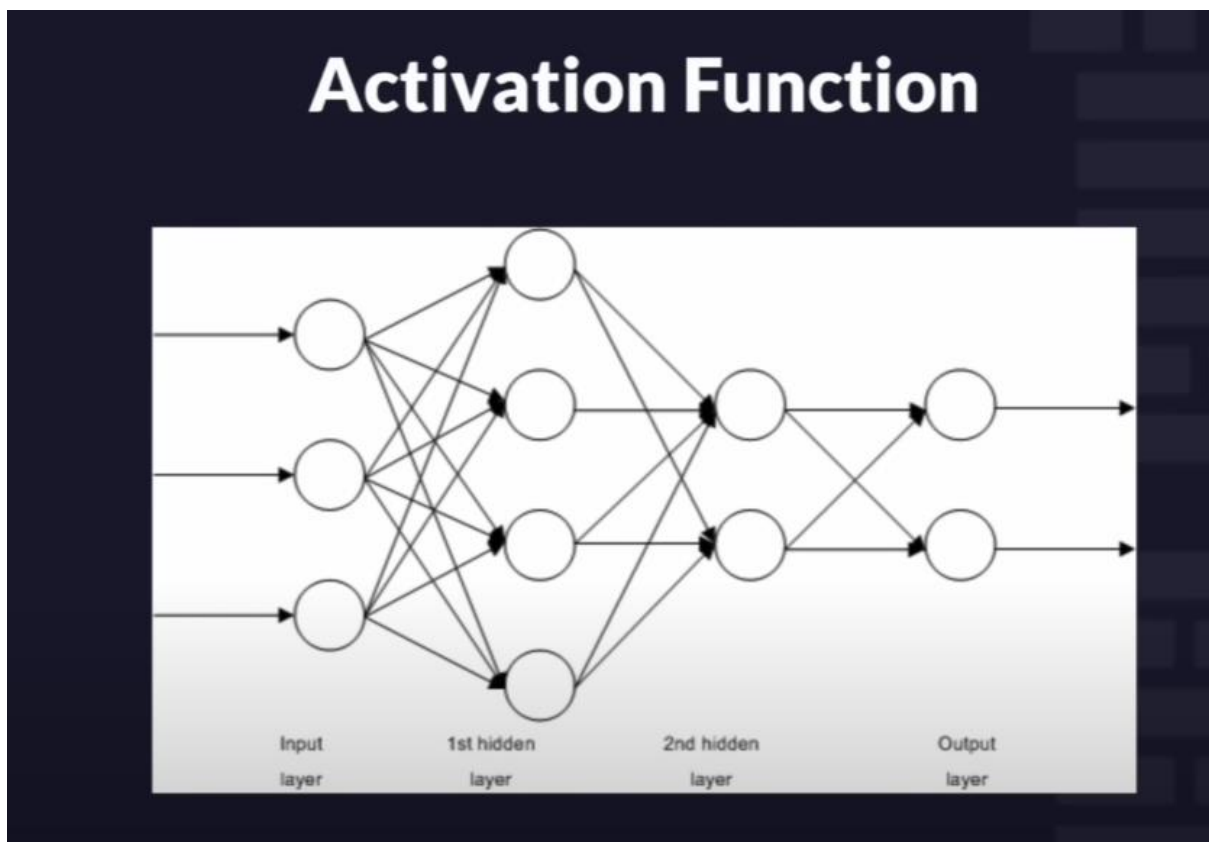
(You just need to know that loss decreases as the performance gets better)

Neural Networks explained

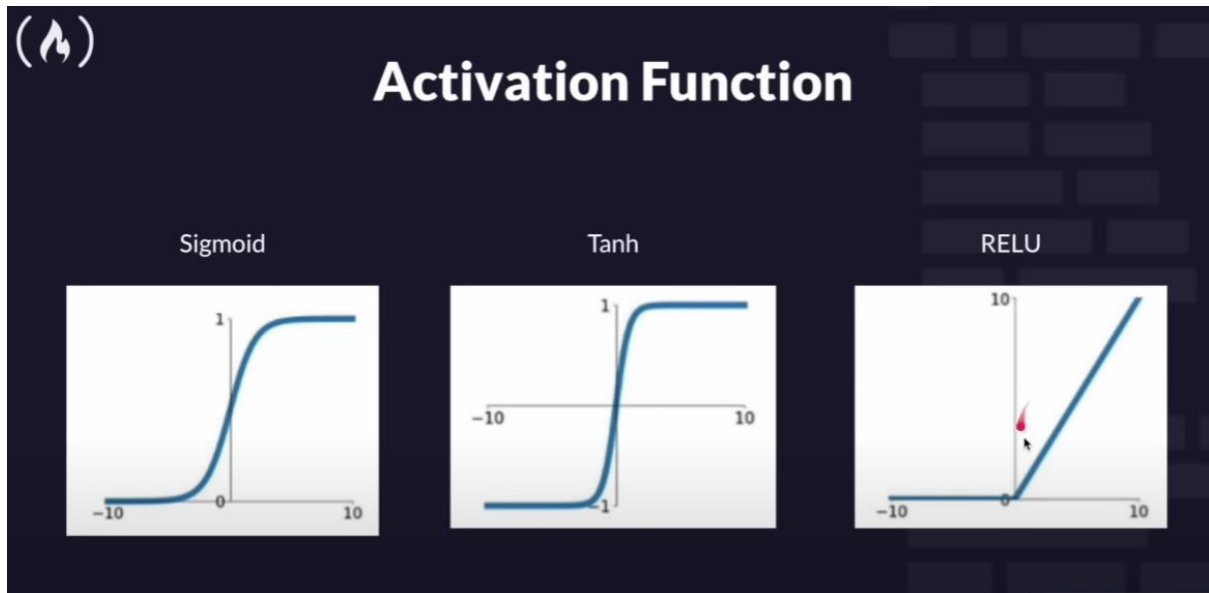
$W(0), W(1)..... W(n)$ are “weights”



Activation function investigated deeper



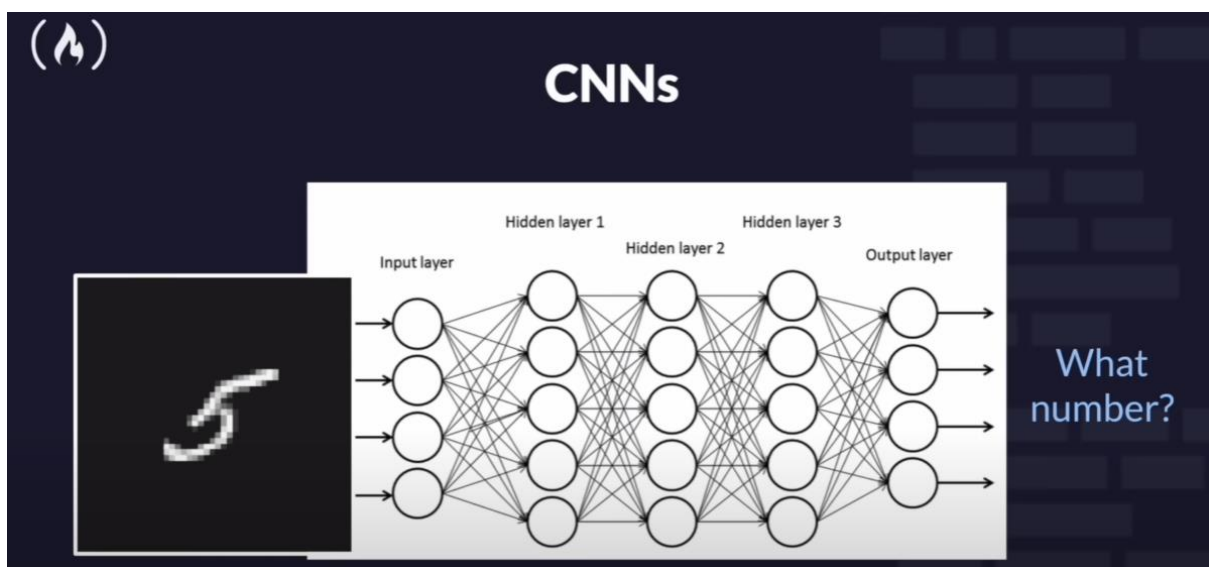
Examples of an activation function



Activation functions currently used in PrototypeML3

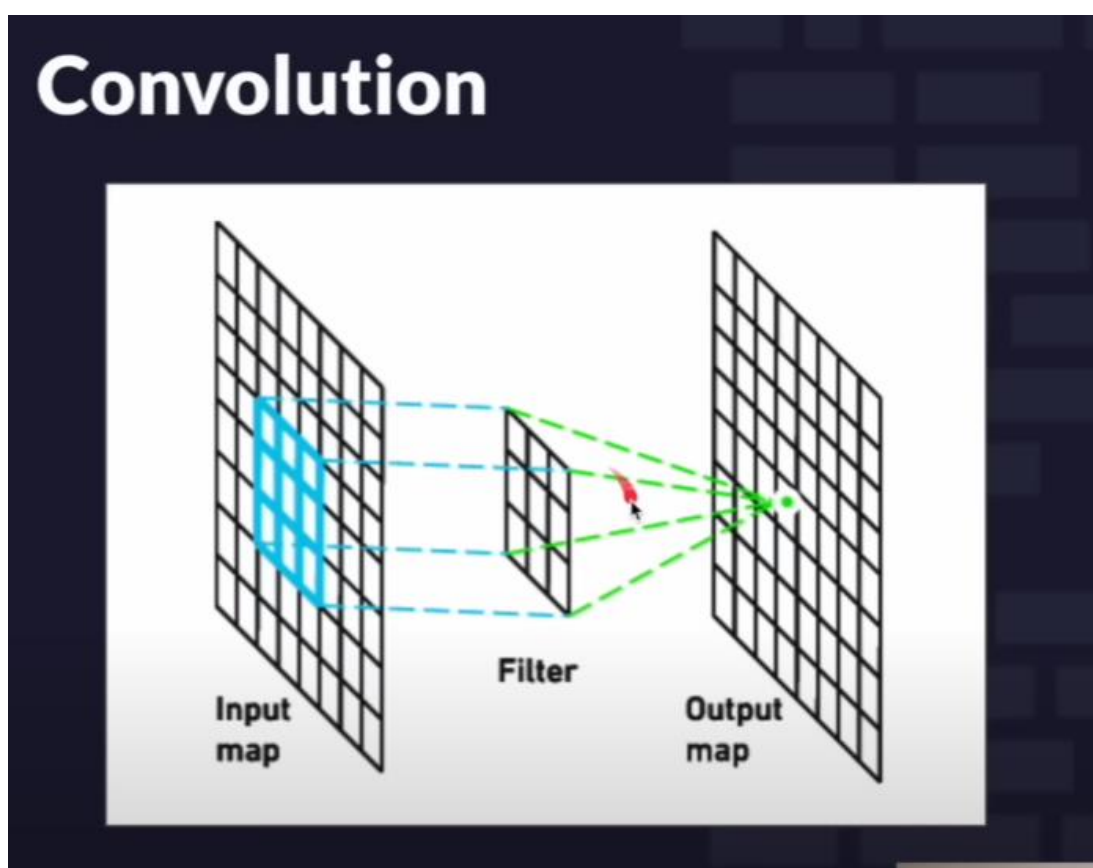
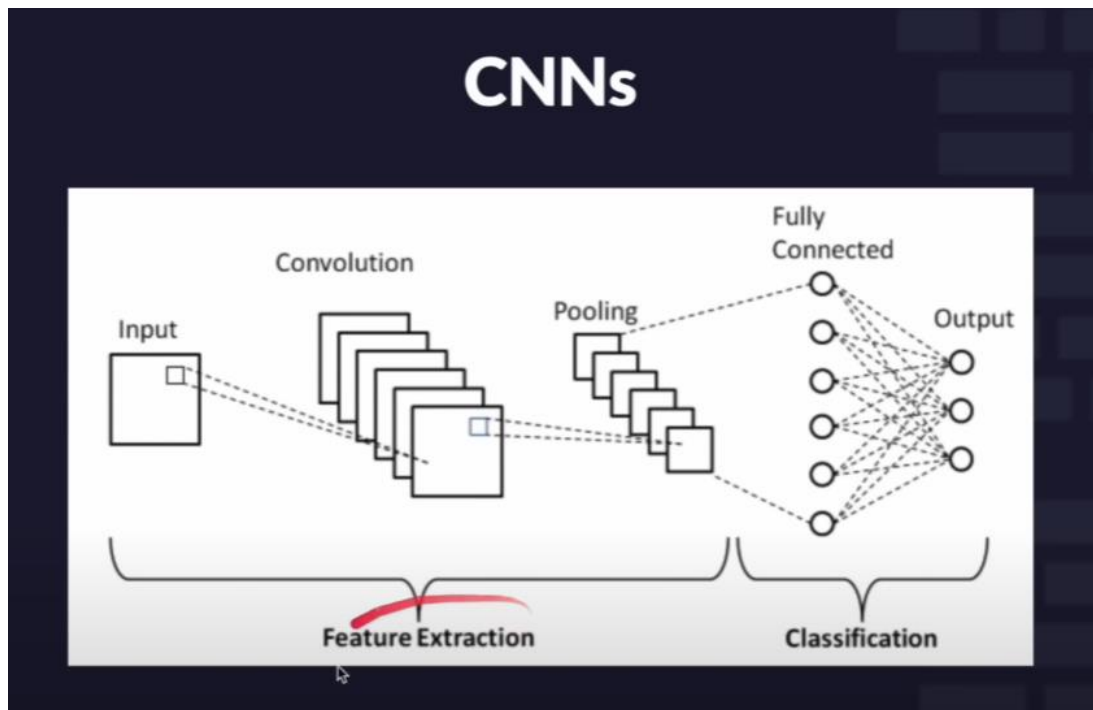
```
# Add new classification layers on top of the pre-trained model
model = models.Sequential()
model.add(base_model)
model.add(layers.Flatten())
model.add(layers.Dense(128, activation='relu'))
model.add(layers.Dense(1, activation='sigmoid')) # Change the output units to 1 for binary classification
```

Neural network

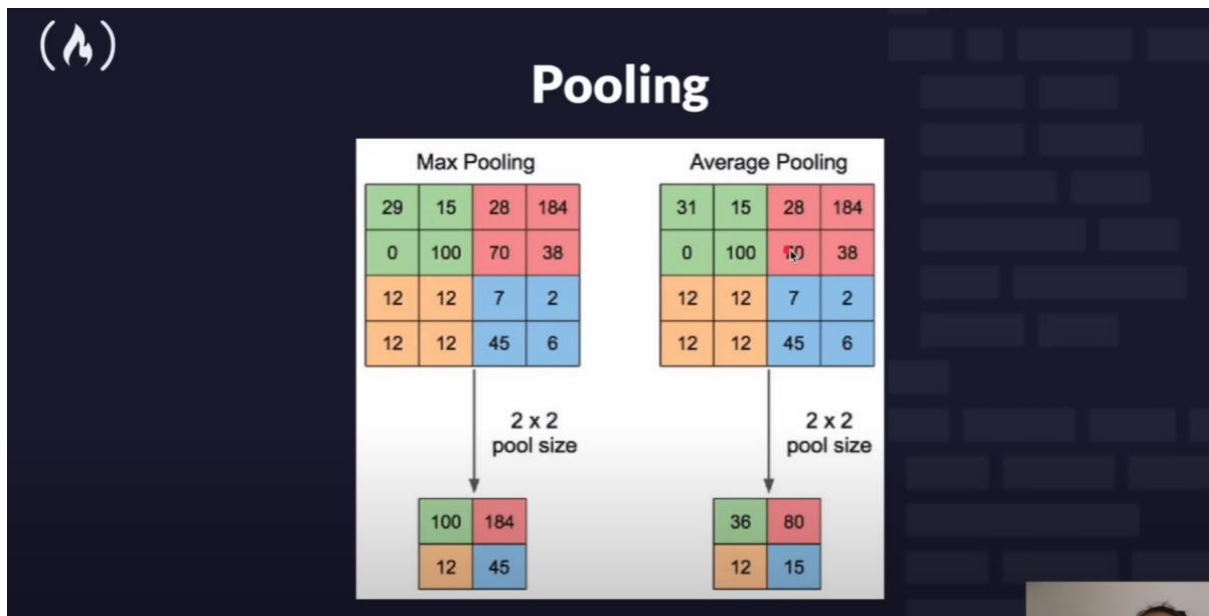


Neural Network for images (CNN's)

Uses the standard neural network above which is seen on right of images but the image that is being passed through needs to be condensed down into a vector that can be passed into the neural network to make predictions.



Taking info from larger array and condensing it into smaller array



[3D Visualization of a Fully-Connected Neural Network \(adamharley.com\)](http://adamharley.com)

