**Deep Learning Coursera**[**Neural Networks and Deep Learning**](https://www.coursera.org/learn/neural-networks-deep-learning/home/welcome)Neural Network: all features densely connected to all neurons in hidden layers. The network fins a way to make combinations of features that are important to predict the Target.  
Structured data: Tables Unstructured data: audio track, images, texts

DL drivers: we collect more data IoT, digitalization.. DL can leverage all the data better than ML.  
Then it would come more computational power and better algorithms.

Loss Function: applies on a single training example

Cost Function: Loss function applied to all training/testing examples. The cost of the fitted model parameters (w,b)

Vectors Broadcasting in numpy:  
when you make element-wise operations with matrix, it will replicate a matrix if it “lacks” one dimension, and replicate it in that direction to make the dimensions of both matrix match  
A close-up of a white board

AI-generated content may be incorrect.

Will throw an error if condition Is not matched: assert(2==3)

Use 2d arrays, never rank 1 arrays. These arrays have the shape (n,) instead of (n,1) or (1,n).  
To convert them use reshape, and initialize them specifying the 2 dimensions: np.zeros(n,1)

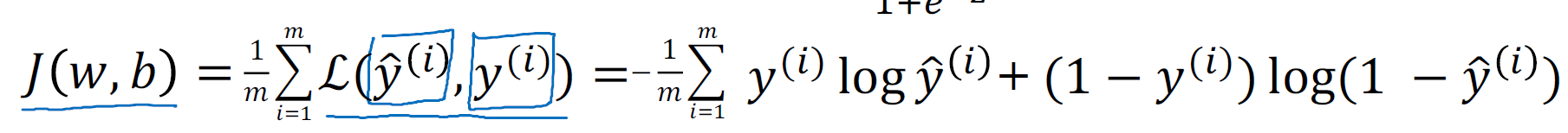
When summarising matrix (np.sum, np.mean..(axis=)), use option keepdims=True to have the output respecting the dimensions of the input an dnot like 1d array.  
np.sum(x\_exp, axis=1, keepdims=False)

A black and white math equation

AI-generated content may be incorrect.**Logistic Regression**z = w.T \* X + b

Sigmoid Function **A =**    
  
Loss Function

A math equations on a white background

AI-generated content may be incorrect.  
Partial Derivatives of Loss Function  
  
Update Parameters – Gradient Descent  
A whiteboard with blue writing

AI-generated content may be incorrect.

**Image Processing steps:**Figure Out Dimensions of data: nsamples, npixels\_x, npixels\_y, 3(RGB)  
Flatten: reshape(nsamples, npixels\_x\*npixels\_y\*3).T = reshape(nsamples,-1).T  
Standardize: Divide all rows (all matrix) by 255