# Lab 1 Prep

In this lab session, we will work through the tutorial [Keras for Beginners: Building Your First Neural Network](https://victorzhou.com/blog/keras-neural-network-tutorial/#the-full-code), Victor Zhou to gain some experience using the Keras deep learning package.

By the end of this lab session, you should:

* have installed the “mnist” package
* have typed out the tutorial code by hand in a Jupyter notebook and have it running error free
* be able to explain the tensor (data) shapes of (784,) and (60000, 784); what they mean and where they come from
* be able to explain the role of train, validation, and test sets and understand why the tutorial is only using train and test
* be able to sketch (on paper) the architecture/structure of the model being used
* be able to calculate by hand how many parameters (weights and biases) the network is using
* be able to understand the output of model.summary() and use to verify the parameter calculation done above
* be able to explain why this neural network has 10 output neurons
* be able to give a brief explanation of the [softmax function](https://victorzhou.com/blog/softmax/) and how it is being used
* be able to explain one-hot encoding of the target values
* be able to provide basic explanations of the role of the terms “optimizer”, “loss”, and “metric”
* be able to explain the difference between training a network and testing a network