CNN Tutorial Plan

## Python (45mins)

* Basics (S)
  + Data structures: lists, dictionaries, python lists
  + loops, functions, and classes
  + importing packages
  + NumPy
* Data Handling (N)
  + Reading Data: Neural Data CSV file
  + Basic Data Visualization:
    - Heatmap
    - Find most preferred images and least preferred images for a neuron
    - Correlation Plot between Neurons m

## CNN theory summary (10 mins)

* Neural Networks: repeated matrix multiplication + nonlinearities
  + Why do we need something more than this for images?
* Convolutions + Neural networks -> Solution?

## CNN tutorial (2hrs)

### Pretrained Network (S)

* Dataset 4 classes, ~5000 per class (CIFAR subset?)
* pretrained vgg16
  + print all layers
  + one shot classification
  + getting activations (without explaining hooks)
    - visualize the feature maps

### Training from scratch (N)

* Dataset and Dataloader
* Constructing a CNN (AlexNet architecture)
* Training loop for ~10 epochs
* Evaluating the model
  + Training loss and accuracy
  + Test accuracy
  + Confusion matrix
* (optional based on time constraints): freezing layers with pretrained weights and training only a part of the model