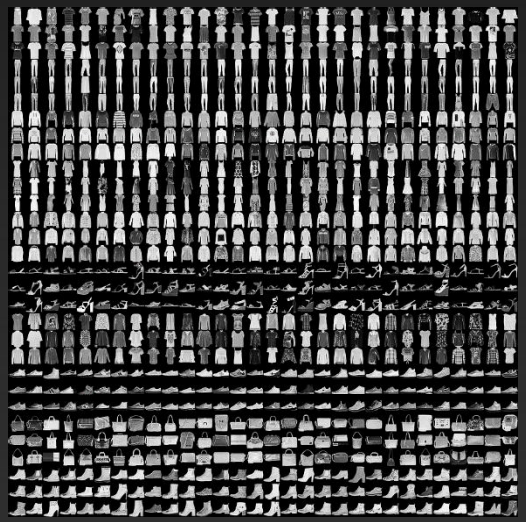
Assignment #5: Fashion MNIST

We have done very well with MNIST, and trying to improve it much more will have very diminishing returns. Let us find a more challenging problem.

We have a very obvious and incremental nest step with Fashion MNIST. These are 60,000 training images, and 10,000 test images of 10 types of clothing, in 28x28 greyscale. Sound familiar?



PITTSBURGH SUPERCOMPUTING CENTER

Assignment #5: Fashion MNIST

It is very easy to just change one line of code and we are using this new and more challenging dataset:

```
mnist = tf.keras.datasets.fashion_mnist
```

And, if you run using our current networks, you even get reasonable results. You should consider this your "baseline". However, we now have a lot more room for improvement.

Your job is to find a better network, and get those improvements. You have plenty of hyperparameters to play with here, so you won't be short of options to explore.

You can change some of the obvious ones we have just investigated in obvious ways (brute force, bigger, bigger!) or you can peruse the documentation for inspiration.

This is an open-ended research project. There is no right answer, and you may even surpass my own solutions. However, if you put in a reasonable effort you should have no problem getting a measurable improvement over the baseline. And if you want to determine what a reasonable ceiling might be, I suggest a little Googling. *A literature search is the essential starting point for any deep learning project!*

Assignment #5: Logistics

Deadline: November 26th. Before we start the lecture.

Points: 5 points.

Format: Email me your most accurate TensorFlow script as an attachment and the final results in the body of the email. This includes at least the test accuracy.

You will also need to include some kind of table or log of the hyperparameter tests that led you there. This might include some dead ends, or it might just be a serious investigation of one hyperparameter that worked out to improve over baseline. By "serious investigation" you should at least have some data points to indicate that this value is optimal in its own slice of the parameter space. This is typically an accuracy graph that shows "this kept giving better results, and then I went too far". This will be most of the grade!

Feel free to include comments in the body of the mail (and the code!). If you have problems, let me know what you were thinking and I will try to give you as much credit as possible.

I will be happy to answer any questions at any time. This often includes the night before things are due, but you don't want to count on that.