HW 5

Start Assignment

Due Feb 24 by 11:59pm **Points** 10 **Submitting** a text entry box or a file upload
Available Feb 16 at 12am - Feb 24 at 11:59pm 9 days

Part 1: Compare the different compiler setups

Use the same set of IMDB data in the posted IMDB.ipynb file:

List the comparison results with each setup variations and explain your observations.

- We used two hidden layers. Try using one or three hidden layers, and see how doing so affects validation and test accuracy.
- Try using layers with more hidden units or fewer hidden units: 32 units, 64 units, and so on.
- Try using the **mse** loss function instead of **binary_crossentropy**.
- Try using the **tanh** activation (an activation that was popular in the early days of neural networks) instead of **relu**.

Part 2: Examine the impact of regularization and dropout.

Use the python scripts with fashion_mnist data in HW 4 and testify the impact of adding or without adding the regularization and the impact of adding or without adding the dropout.

Task 1: add the regularization

```
from keras import models
from keras import layers
from keras import regularizers
network = models.Sequential()
network.add(layers.Dense(512, kernel_regularizer=regularizers.l2(0.001), activation='relu', input_shape=(28 * 28,)))
network.add(layers.Dense(10, activation='softmax'))
```

Task 2: add the dropout rate

```
from keras import models
from keras import layers
from keras import regularizers
network = models.Sequential()
network.add(layers.Dense(512, activation='relu', input_shape=(28 * 28,)))
network.add(layers.Dropout(0.5))
network.add(layers.Dense(10, activation='softmax'))
```

You are asked to tune the parameter settings with different regularization factors and different dropout rates.

Explain your observations and justify if the overfitting problem in the test data set has been released.