Data Science Quiz Day 2

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| Instructor: | Stuart Whipp, Ben Whalley | Name: |  |
|  |  | Date: |  |

Try your best to answer these questions based on topics discussed thus far. Expected to take 15-30 minutes with discussion.

1. If we have a dense neural network layer, with 50 neurons, and it receives outputs from a layer which has 100 neurons, how many weights are needed to describe connections between the two layers?
   1. 100 x 50 = 5,000
   2. 50 + 100 = 150
   3. 50 x 50 = 250
2. If we have a dense neural network layer, with 50 neurons, and it receives a monochrome (greyscale) image input of size [200, 200, 1], how many weights are needed to describe connections between the input and this layer?
   1. 200 x 50 = 10,000
   2. 200 x 200 x 50 = 2,000,000
   3. 50 + 200 = 250
3. In Keras, a layers’ weight matrix also includes bias values. How many bias values are needed in the two layers noted above?
   1. 100 and 200
   2. 100 and 40,000
   3. 50 in both cases
   4. 250
4. Which of the following best describes bias values?
   1. Controlling the threshold point of ReLU otherwise set at 0
   2. Encouraging overfitting
   3. Accounts for the number of neurons in the previous layer
5. If we wanted to improve regularization of our neural-network model, which of the following might help ensure it generalizes well with new data?
   1. Max Pooling
   2. Dropout Layer
   3. Train against all available data, without validation or test
   4. Number of epochs
6. Which of the following describes overfitting?
   1. A model which performs well on training data but not on validation or test set
   2. A model that does not have enough capacity
   3. A model that is even better than we expected
7. Which of the following describes underfitting?
   1. A model that hasn’t finished training yet
   2. A model which performs poorly on training data
   3. A model that does not have enough capacity
8. Which of the following is true?
   1. A convolutional layer requires more parameters than dense layer
   2. A convolutional layer has shared weights, and local connectivity
   3. A convolutional layer is must always have padding
9. Which is the purpose of ‘same padding’?
   1. To ensure a neural network has the same setting for every layer, so they match
   2. To ensure the output of a layer, matches the size of the inputs
   3. To reduce overfitting
10. Which is the purpose of ‘average pooling’?
    1. To down sample data, reducing width and height
    2. To increase the learning rate
    3. To reduce overfitting