Assignment 2

Due date Tuesday, March 17, 2020

Please submit your commented Jupyter Notebook named as **FirstName_LastName.**

1. (25 Points) How many dimensions must the inputs of an RNN layer have? What does each dimension represent? What about its outputs?

2. (25 Points) Consider a CNN composed of three convolutional layers, each with 3 × 3 kernels, a stride of 2, and "same" padding. The lowest layer outputs 100 feature maps, the middle one outputs 200, and the top one outputs 400. The input images are RGB images of 200 × 300 pixels. What is the total number of parameters in the CNN? If we are using 32-bit floats, at least how much RAM will this network require when making a prediction for a single instance? What about when training on a mini-batch of 50 images?

3. (50 Points) Use transfer learning for large image classification, going through these steps:
    a. Create a training set containing at least 100 images per class. For example, you could classify your own pictures based on the location (beach, mountain, city, etc.), or alternatively you can use an existing dataset (e.g., https://www.kaggle.com/puneet6060/intel-image-classification).
    b. Split it into a training set, a validation set, and a test set.
    c. Build the input pipeline, including the appropriate preprocessing operations, and optionally add data augmentation.
    d. Fine-tune a pretrained model on this dataset.