**Homework #3**

GitHub: <https://github.com/pballou/ECGR_4106/tree/master/Homework>

**Problem 1**

1. RNN results:
   1. Sequence = 10
      1. Train loss: .1318
      2. Validation accuracy: .5030
      3. Training time: 4.49 seconds
   2. Sequence = 20
      1. Train loss: .1253
      2. Validation accuracy: .5212
      3. Training time: 8.48 seconds
   3. Sequence = 30
      1. Train loss: .1291
      2. Validation accuracy: .5294
      3. Training time: 11.1 seconds
2. LSTM results:
   1. Sequence = 10
      1. Train loss: .1214
      2. Validation accuracy: .5050
      3. Training time: 3.93 seconds
   2. Sequence = 20
      1. Train loss: .1067
      2. Validation accuracy: .5010
      3. Training time: 7.36 seconds
   3. Sequence = 30
      1. Train loss: .1349
      2. Validation accuracy: .4929
      3. Training time: 11 seconds
3. GRU results:
   1. Sequence = 10
      1. Train loss: .1344
      2. Validation accuracy: .5010
      3. Training time: 4.03 seconds
   2. Sequence = 20
      1. Train loss: .181
      2. Validation accuracy: .5253
      3. Training time: 7.5 seconds
   3. Sequence = 30
      1. Train loss: .1758
      2. Validation accuracy: .5132
      3. Training time: 10.9 seconds

**Problem 2**

1. LSTM results:
   1. Sequence = 20
      1. Train loss: 1.23
      2. Validation accuracy: 58.43
      3. Training time: 10 minutes
   2. Sequence = 30
      1. Train loss: 1.22
      2. Validation accuracy: 58.59
      3. Training time: 11 minutes
   3. Sequence = 50
      1. Train loss: 1.21
      2. Validation accuracy: 59.21
      3. Training time: 13 minutes
2. GRU results:
   1. Sequence = 20
      1. Train loss: 1.39
      2. Validation accuracy: 55.96
      3. Training time: 10 minutes
   2. Sequence = 30
      1. Train loss: 1.37
      2. Validation accuracy: 56.35
      3. Training time: 11 minutes
   3. Sequence = 50
      1. Train loss: 1.37
      2. Validation accuracy: 56.8
      3. Training time: 13 minutes