Problem 3:

Preliminaries: MobileNet evaluations:

```
process image 4950
Load Image: 0.003721 seconds.
Inference time:  0.00545954704284668
Prediction: 0.029694 seconds.
process image 4951
Load Image: 0.004094 seconds.
Inference time:  0.005414009094238281
Prediction: 0.034233 seconds.


Average Precision Per-class:
aeroplane: 0.6843271224059599
bicycle: 0.7911140237662206
bird: 0.6171819168583986
boat: 0.5612220055063379
bottle: 0.3485216621466003
bus: 0.7677814849265677
car: 0.7280986468467315
cat: 0.8369208203985581
chair: 0.5169138632991064
cow: 0.6238697603075337
diningtable: 0.7062172972736019
dog: 0.7872656014540705
horse: 0.819446325939355
motorbike: 0.7918539457195842
person: 0.702363739134837
pottedplant: 0.3985294933564374
sheep: 0.6066678298227772
sofa: 0.7573083661544429
train: 0.8262441264750008
tvmonitor: 0.6461898726506375

Average Precision Across All Classes:0.6759018952221378
jupyter@pytorch-20191128-090239:~/p4/pytorch-ssd$ ▊
```

1. Gun model accuracy prior to pretraining:

```
Prediction: 0.019779 seconds.
process image 113
Load Image: 0.013086 seconds.
Inference time:  0.005430698394775391
Prediction: 0.022696 seconds.
process image 114
Load Image: 0.005801 seconds.
Inference time:  0.005502223968505859
Prediction: 0.021137 seconds.
process image 115
Load Image: 0.030274 seconds.
Inference time:  0.006104946136474609
Prediction: 0.026075 seconds.
process image 116
Load Image: 0.018318 seconds.
Inference time:  0.0055544376373291016
Prediction: 0.023445 seconds.
process image 117
Load Image: 0.017751 seconds.
Inference time:  0.005439281463623047
Prediction: 0.022205 seconds.
process image 118
Load Image: 0.017205 seconds.
Inference time:  0.005541801452636719
Prediction: 0.025228 seconds.
process image 119
Load Image: 0.007807 seconds.
Inference time:  0.0054476261138916016
Prediction: 0.023720 seconds.
process image 120
Load Image: 0.028009 seconds.
Inference time:  0.005576133728027344
Prediction: 0.025029 seconds.
process image 121
Load Image: 0.030677 seconds.
Inference time:  0.005472660064697266
Prediction: 0.024812 seconds.
process image 122
Load Image: 0.016972 seconds.
Inference time:  0.005519866943359375
Prediction: 0.029891 seconds.


Average Precision Per-class:
Handgun: 0.717264083289075
Shotgun: 0.36675558549231463
```
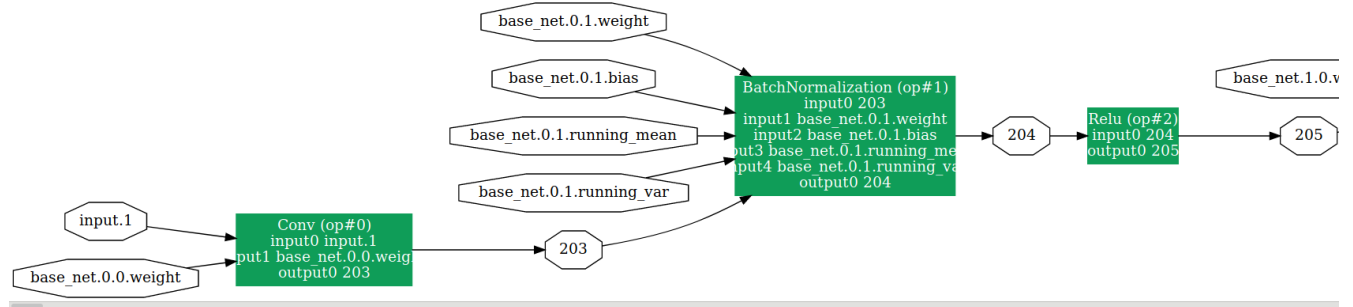
Post Retraining / FineTuning:

```
process image 115
Load Image: 0.029430 seconds.
Inference time:  0.006186008453369141
Prediction: 0.017304 seconds.
process image 116
Load Image: 0.017097 seconds.
Inference time:  0.005478858947753906
Prediction: 0.009660 seconds.
process image 117
Load Image: 0.016660 seconds.
Inference time:  0.00549626350402832
Prediction: 0.010582 seconds.
process image 118
Load Image: 0.016109 seconds.
Inference time:  0.005824089050292969
Prediction: 0.012262 seconds.
process image 119
Load Image: 0.006765 seconds.
Inference time:  0.0054743289947509766
Prediction: 0.010021 seconds.
process image 120
Load Image: 0.028801 seconds.
Inference time:  0.0063703060150146484
Prediction: 0.025303 seconds.
process image 121
Load Image: 0.028208 seconds.
Inference time:  0.0054454803466796875
Prediction: 0.016055 seconds.
process image 122
Load Image: 0.015232 seconds.
Inference time:  0.005385637283325195
Prediction: 0.011445 seconds.


Average Precision Per-class:
Handgun: 0.8358746170703227
Shotgun: 0.5202483365724209

Average Precision Across All Classes:0.6780614768213717
jupyter@pytorch-20191128-090239:~/p4/pytorch-ssd$
```

3. Sample Visualization:

4. Onnx server running:

While attempting to send messages to the server, faced Protobuf errors, mostly due to version incompatibility errors.
Requires deep file optimization to rectify the errors.