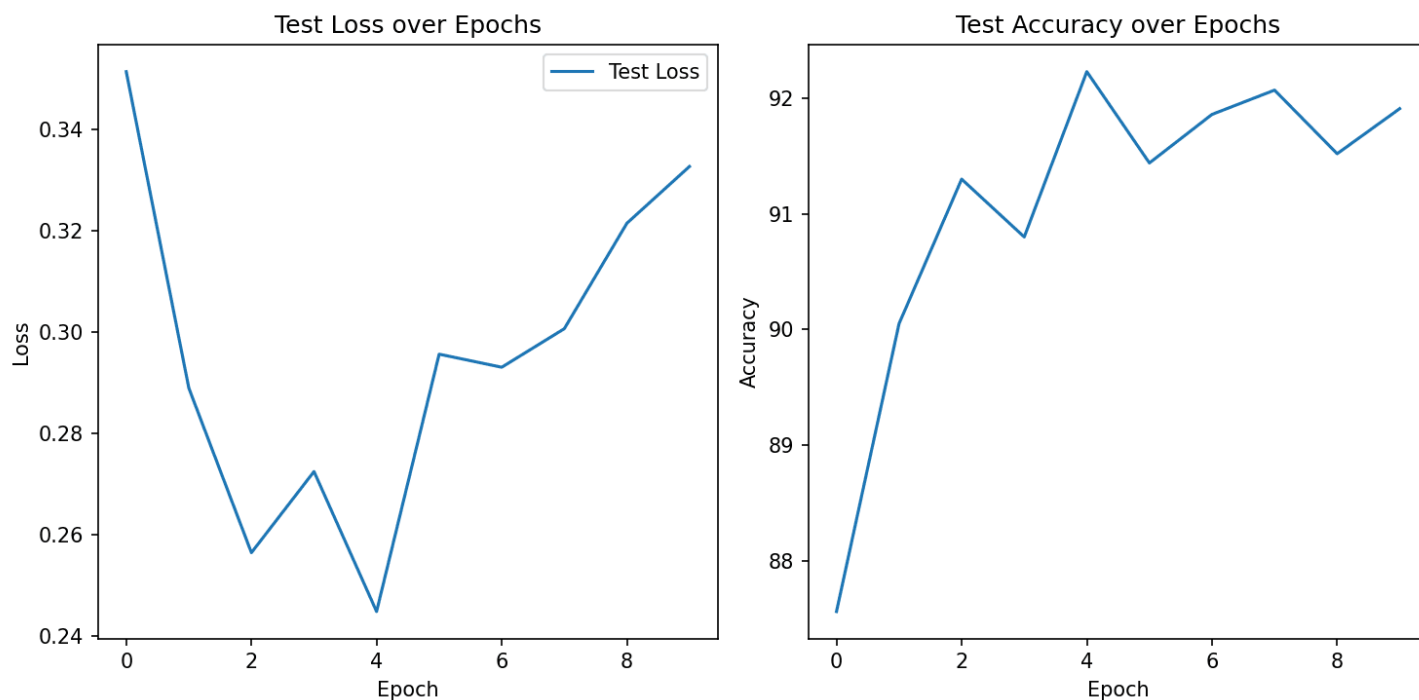


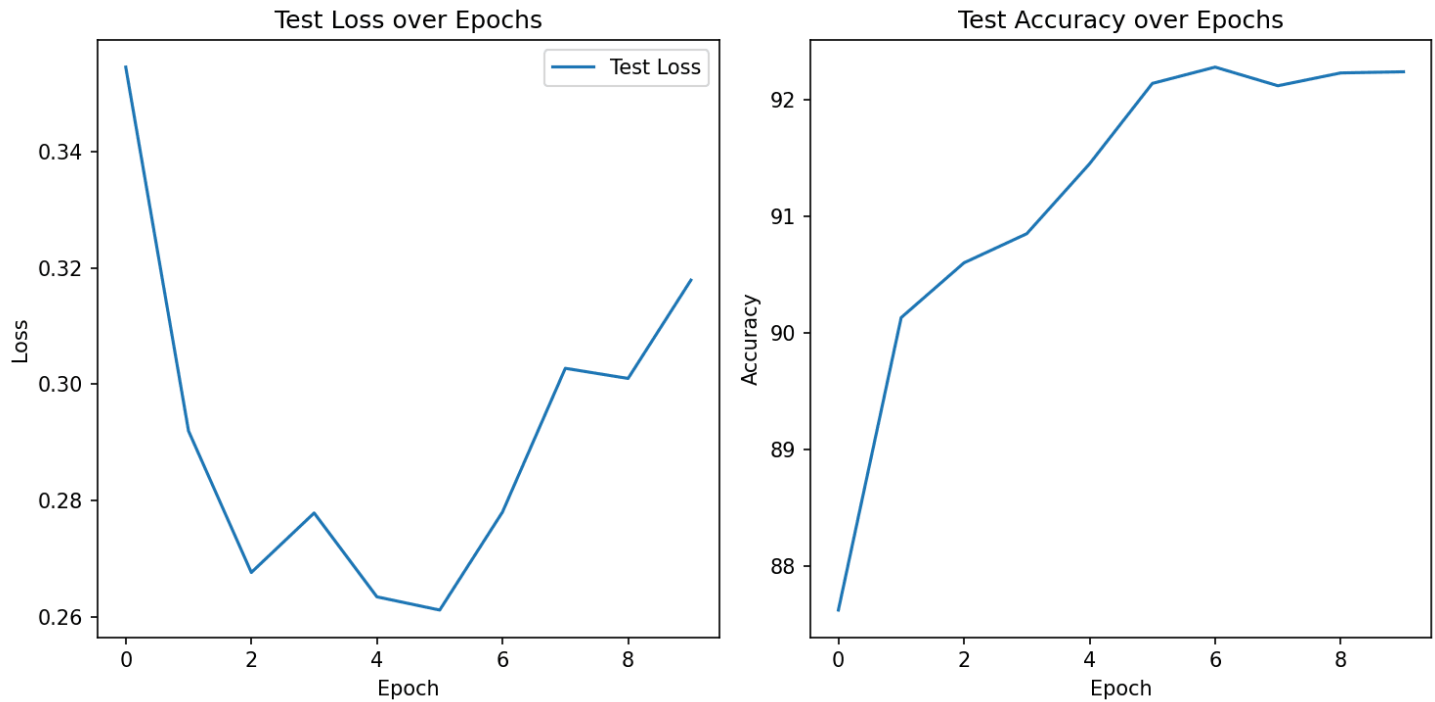
完成效果：

VGG-11:



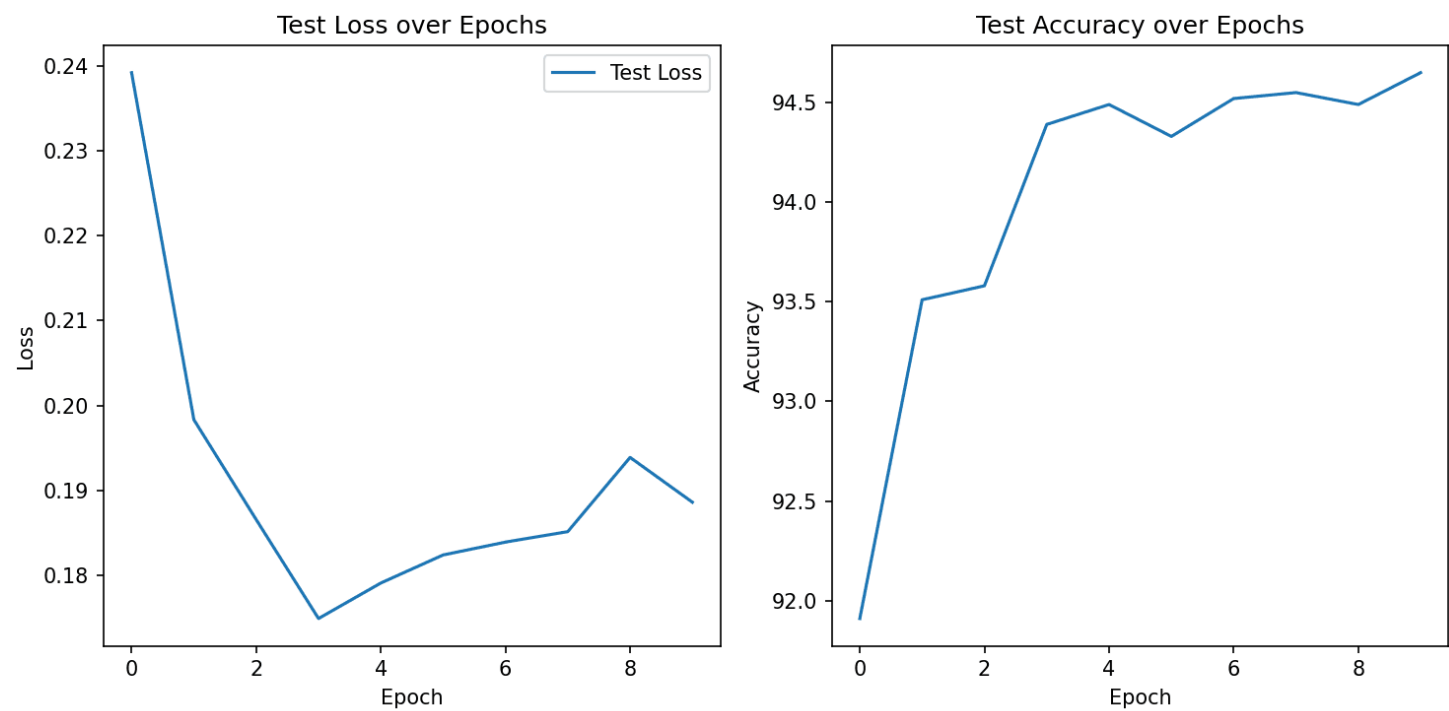
```
Epoch 1/10, Test Loss: 0.3514, Test Acc: 87.56%  
Epoch 2/10, Test Loss: 0.2889, Test Acc: 90.05%  
Epoch 3/10, Test Loss: 0.2564, Test Acc: 91.30%  
Epoch 4/10, Test Loss: 0.2725, Test Acc: 90.80%  
Epoch 5/10, Test Loss: 0.2448, Test Acc: 92.23%  
Epoch 6/10, Test Loss: 0.2956, Test Acc: 91.44%  
Epoch 7/10, Test Loss: 0.2930, Test Acc: 91.86%  
Epoch 8/10, Test Loss: 0.3007, Test Acc: 92.07%  
Epoch 9/10, Test Loss: 0.3215, Test Acc: 91.52%  
Epoch 10/10, Test Loss: 0.3327, Test Acc: 91.91%
```

VGG-13:



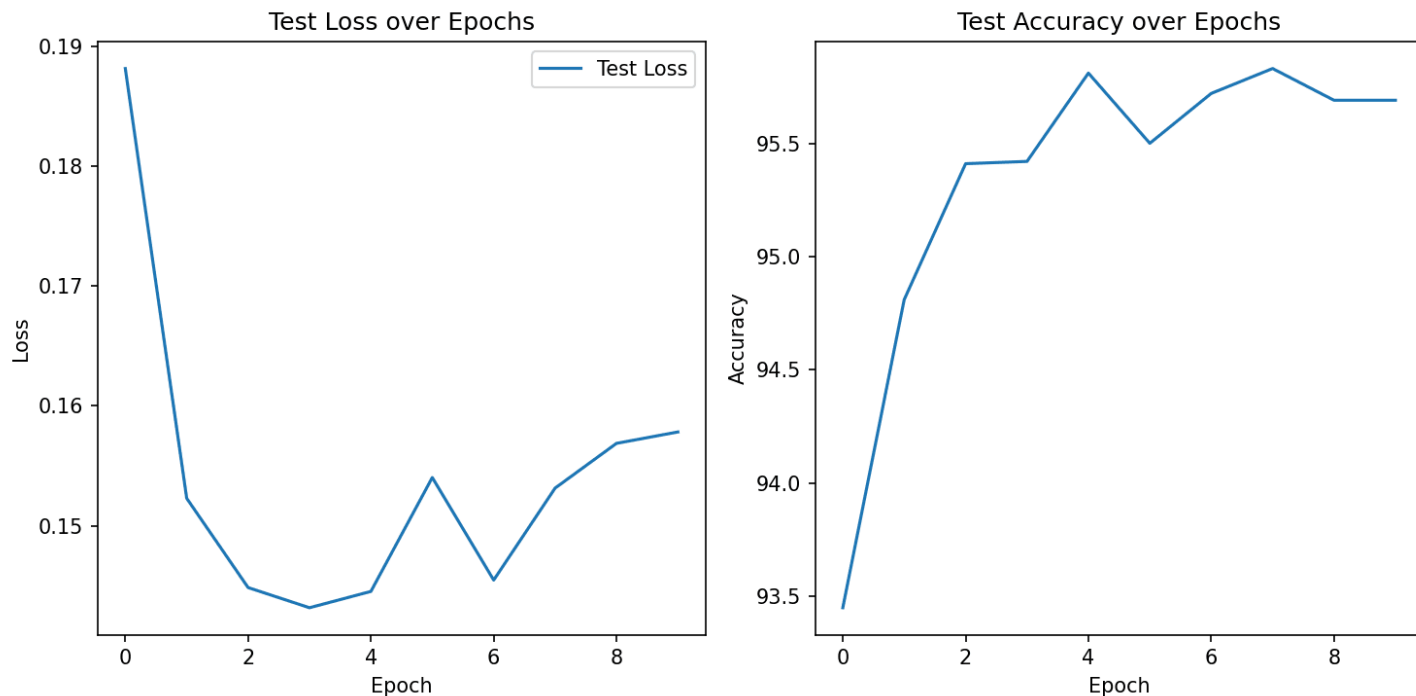
```
Epoch 1/10, Test Loss: 0.3545, Test Acc: 87.62%  
Epoch 2/10, Test Loss: 0.2919, Test Acc: 90.13%  
Epoch 3/10, Test Loss: 0.2676, Test Acc: 90.60%  
Epoch 4/10, Test Loss: 0.2778, Test Acc: 90.85%  
Epoch 5/10, Test Loss: 0.2634, Test Acc: 91.45%  
Epoch 6/10, Test Loss: 0.2611, Test Acc: 92.14%  
Epoch 7/10, Test Loss: 0.2780, Test Acc: 92.28%  
Epoch 8/10, Test Loss: 0.3027, Test Acc: 92.12%  
Epoch 9/10, Test Loss: 0.3010, Test Acc: 92.23%  
Epoch 10/10, Test Loss: 0.3179, Test Acc: 92.24%
```

ResNet-18:



```
Epoch 1/10, Test Loss: 0.2392, Test Acc: 91.91%
Epoch 2/10, Test Loss: 0.1983, Test Acc: 93.51%
Epoch 3/10, Test Loss: 0.1866, Test Acc: 93.58%
Epoch 4/10, Test Loss: 0.1749, Test Acc: 94.39%
Epoch 5/10, Test Loss: 0.1791, Test Acc: 94.49%
Epoch 6/10, Test Loss: 0.1824, Test Acc: 94.33%
Epoch 7/10, Test Loss: 0.1839, Test Acc: 94.52%
Epoch 8/10, Test Loss: 0.1852, Test Acc: 94.55%
Epoch 9/10, Test Loss: 0.1939, Test Acc: 94.49%
Epoch 10/10, Test Loss: 0.1886, Test Acc: 94.65%
```

ResNet-34:



```
Epoch 1/10, Test Loss: 0.1881, Test Acc: 93.45%
Epoch 2/10, Test Loss: 0.1523, Test Acc: 94.81%
Epoch 3/10, Test Loss: 0.1449, Test Acc: 95.41%
Epoch 4/10, Test Loss: 0.1432, Test Acc: 95.42%
Epoch 5/10, Test Loss: 0.1445, Test Acc: 95.81%
Epoch 6/10, Test Loss: 0.1540, Test Acc: 95.50%
Epoch 7/10, Test Loss: 0.1455, Test Acc: 95.72%
Epoch 8/10, Test Loss: 0.1531, Test Acc: 95.83%
Epoch 9/10, Test Loss: 0.1569, Test Acc: 95.69%
Epoch 10/10, Test Loss: 0.1578, Test Acc: 95.69%
```

由上述可见，VGG的效果明显差于ResNet（损失函数更大，准确率更低），而在相同的大模型下层数越多，完成效果越好。

除此之外，个人感觉在运行时VGG的速度明显慢于ResNet。而相同大模型下，层数越多，运行时间越长。

分析原因：

ResNet与VGG

1. ResNet引入了残差结构，允许网络学习残差映射，而不是直接学习完整的特征映射，只需学习输入与输出的微小差异。
2. ResNet内还有批量规范化层，能够更稳定的操作数据。
3. 相比之下，VGG只有卷积层，单一的最大汇聚层，以及全连接层。相当于ResNet的架构包含了VGG的架构。

相同大模型不同层数

层数更多意味着具有更深的网络结构，更深的网络通常具有更强的表达能力，可以捕捉到更复杂的特征和模式，所以效果更好。在一个过滤过程中，更多层数的模型就像装了更多的过滤器。