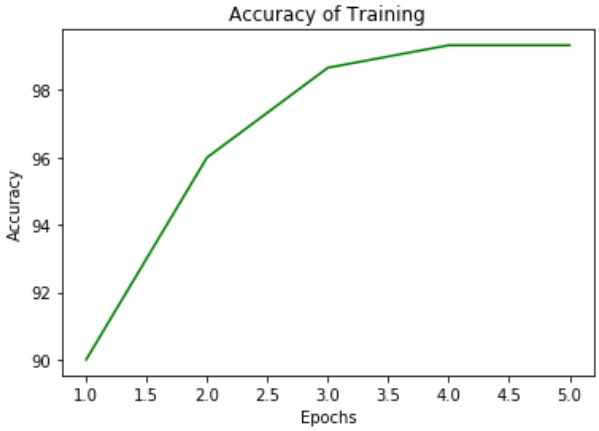
Observations

1)Model Configuration 1:
Variance:1
Epochs:5

Output of final epoch:

```
Epoch 5
Mean squared Error for means: 0.004321087612032157
Mean squared Error for variance: 0.07922987800558873
Overall accuracy score: 99.33333333333333%
Number of samples classifed for Gaussian Models 1:  50
Number of samples classifed for Gaussian Models 2:  49
Number of samples classifed for Gaussian Models 3:  51
```

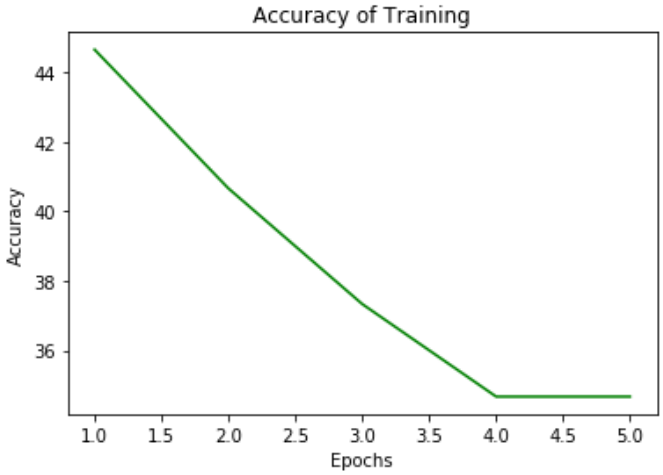


The model may be overfitting with variances initialized to 1.Though the error in variance decreases over each epoch, the accuracy in assigning points to the true mixture element is almost 100%. The error in finding true means decreases with every epoch.

2)Model 2 Configuration:
Variance:1.2
Epochs:5

Output of epoch 5:

```
Epoch 5
Mean squared Error for means: 0.01934175172381687
Mean squared Error for variance: 0.4241968712490006
Overall accuracy score: 34.66666666666667%
Number of samples classifed for Gaussian Models 1:  51
Number of samples classifed for Gaussian Models 2:  47
Number of samples classifed for Gaussian Models 3:  52
```

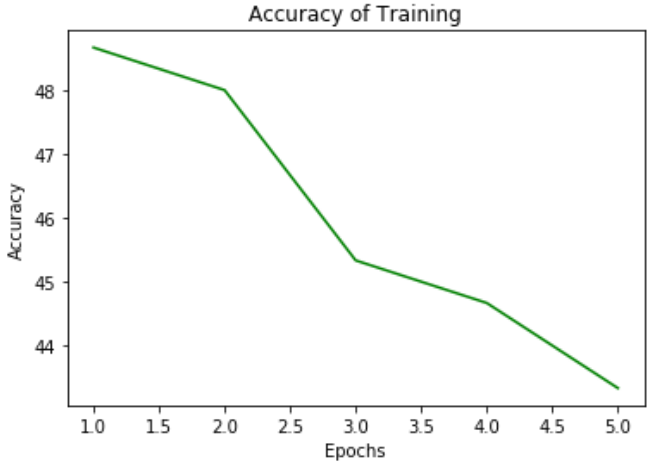


It is observed that the error in variance decreases with each epoch along with the accuracy in assigning points to the true mixture element. The error in finding true means decreases with every epoch.If run for more epoch the accuracy may spike up.

3)Model 3 Configuration:
Variance:2.3
Epochs:5

Output of epoch 5:

```
Epoch 5
Mean squared Error for means: 0.4216450114749586
Mean squared Error for variance: 7.491153824990019
Overall accuracy score: 43.333333333333336%
Number of samples classifed for Gaussian Models 1:  46
Number of samples classifed for Gaussian Models 2:  39
Number of samples classifed for Gaussian Models 3:  65
```

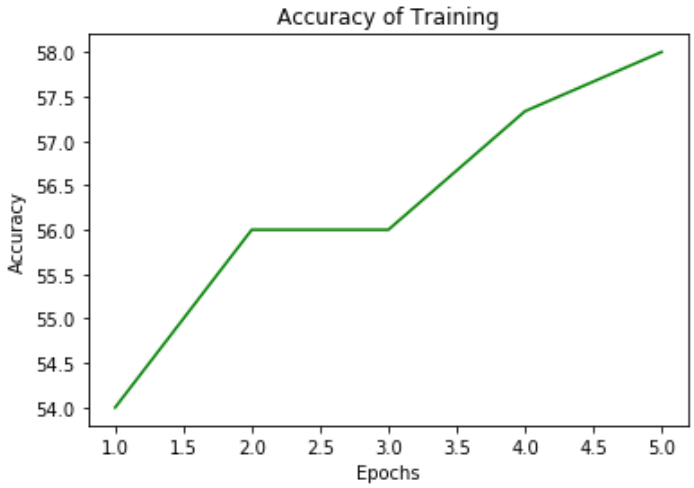


The overall accuracy in assigning points to the true mixture element decreases gradually and the error in variances also increases. The error in finding true means decreases with every epoch.

4) Model 4 Configuration:
Variance:10
Epochs:5

Output of epoch 5:

```
Epoch 5
Mean squared Error for means: 8.559920091551353
Mean squared Error for variance: 623.7793505527411
Overall accuracy score: 57.99999999999999%
Number of samples classifed for Gaussian Models 1:  63
Number of samples classifed for Gaussian Models 2:  0
Number of samples classifed for Gaussian Models 3:  87
```



The accuracy of the model in assigning points to the true mixture element increases with every epoch but the error in variance also increases. The error in finding true means decreases with every epoch.
So may be after few epochs the accuracy may drop down drastically or the variance errors may decrease to give better results.