Screenshots of the Assignment 3

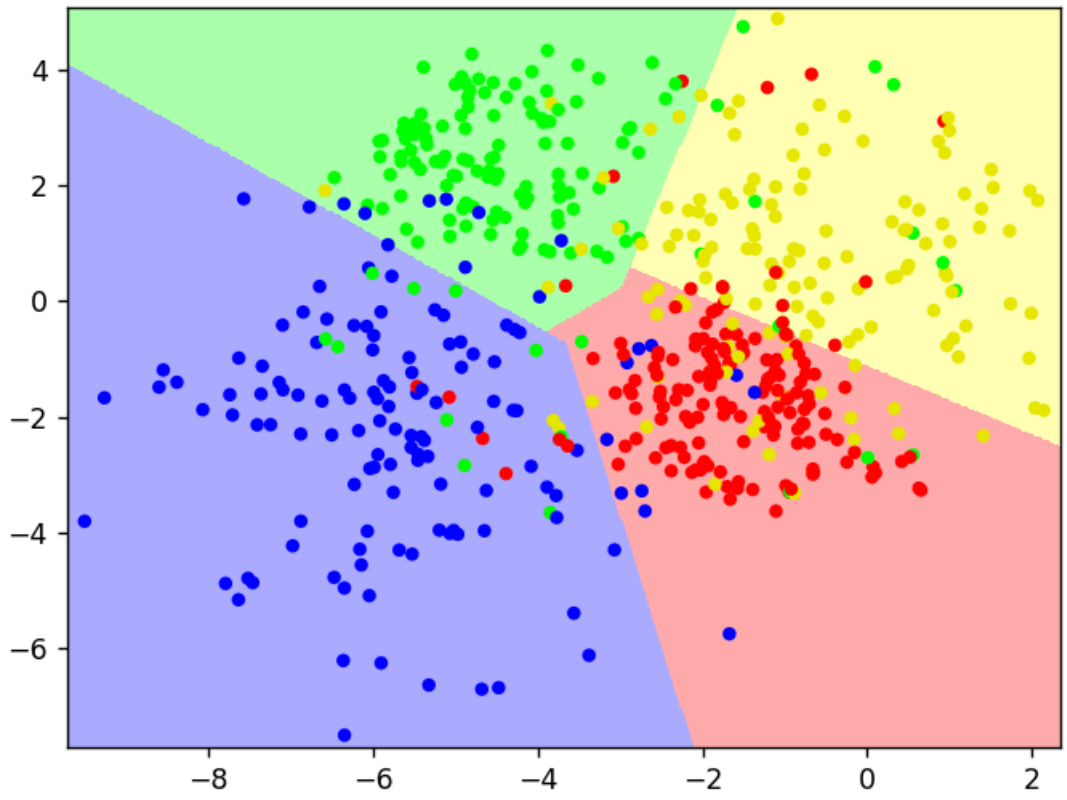
Ex1

Scores and parameters

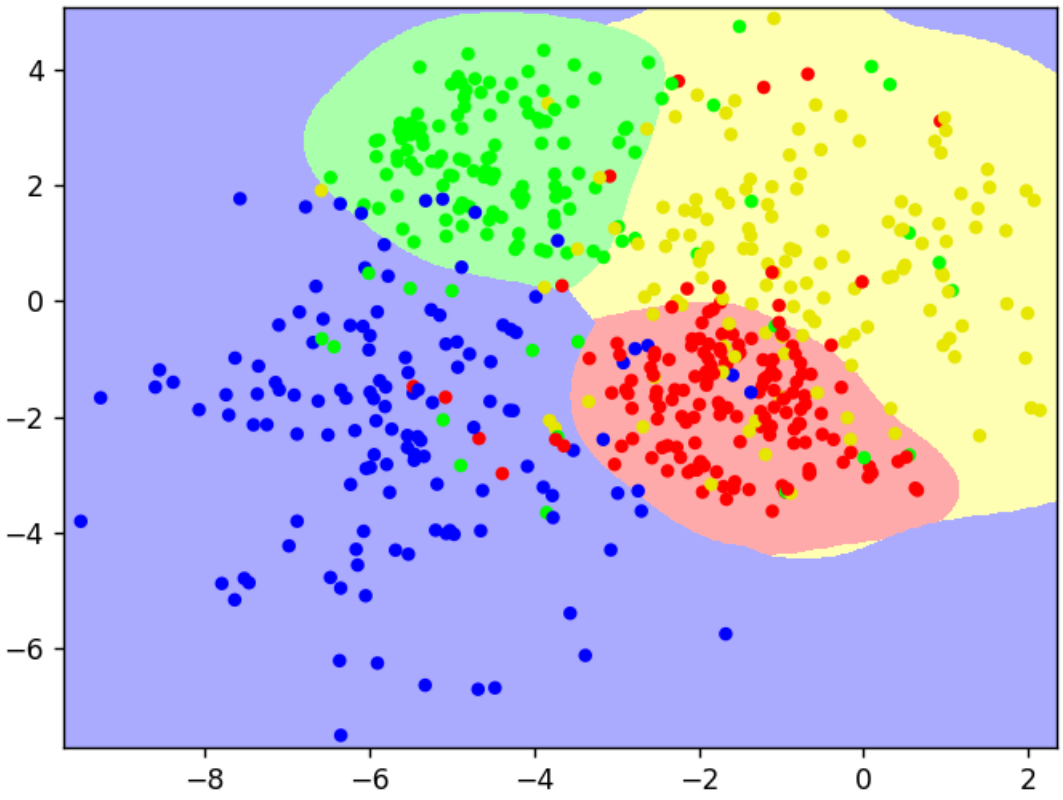
```
Best Linear score: 0.820511583011583 Best parameters: {'C': 7, 'kernel': 'linear'}.
Best rbf score: 0.8223133848133848 Best parameters: {'C': 0.1, 'gamma': 1, 'kernel': 'rbf'}.
Best poly score: 0.820511583011583 Best parameters: {'C': 0.5, 'degree': 1, 'gamma': 10, 'kernel': 'poly'}.
```

Decision boundary

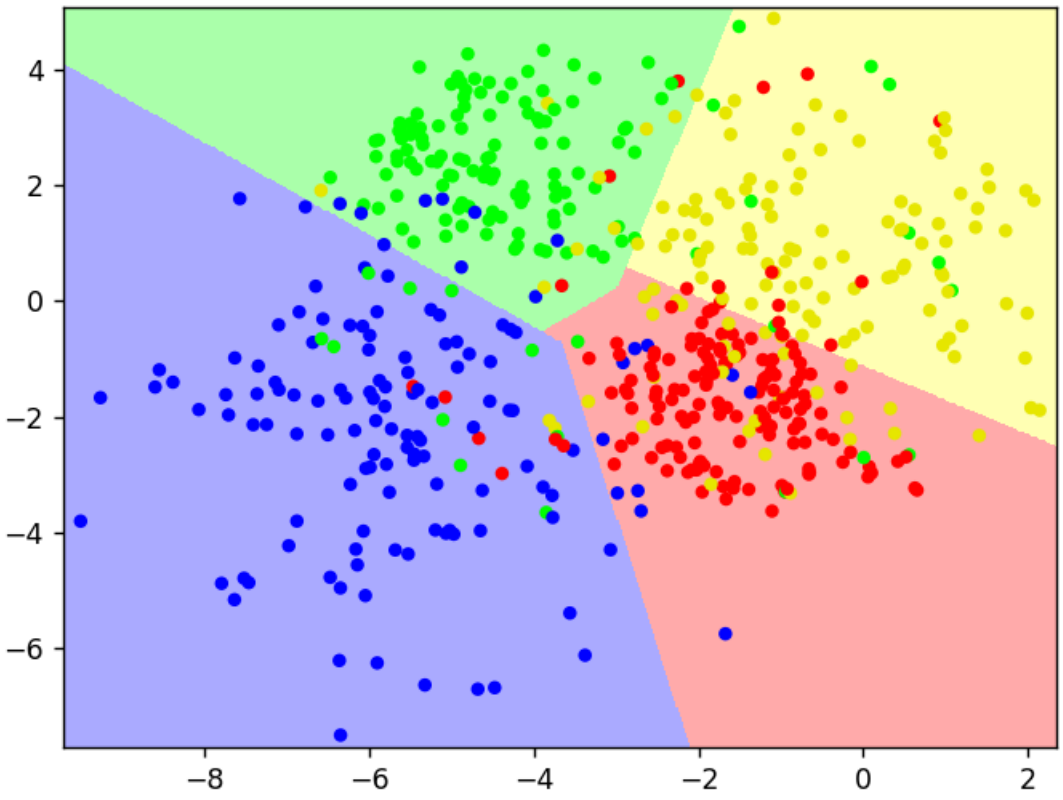
Linear



Rbf



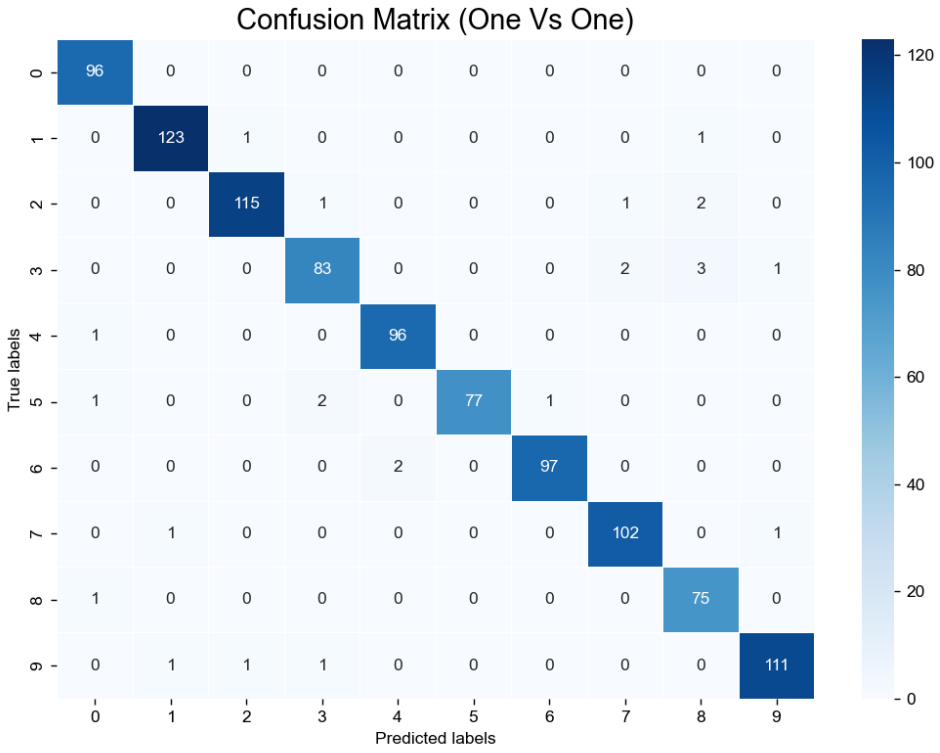
poly

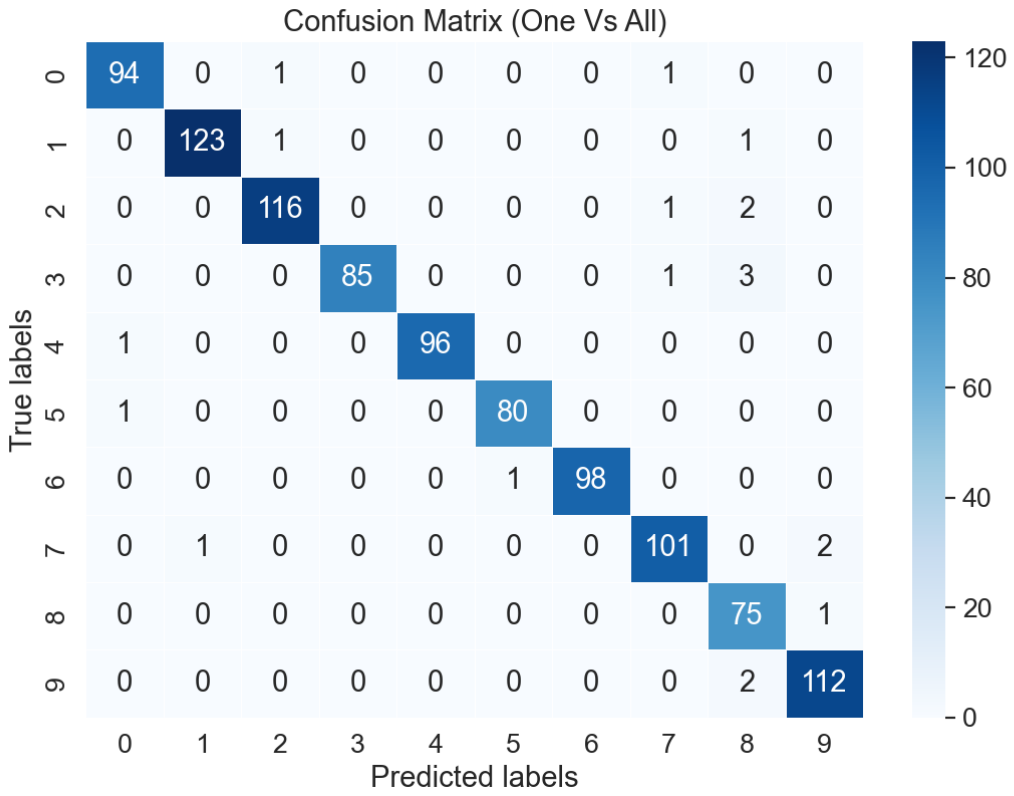


Ex2

parameters

```
  warnings.warn(
Best Score: 0.9644999999999999
 best parameters: {'C': 8}
accuracy score: 0.965
```






```
accuracy score: 0.980
```

OVA produces a higher accuracy score, however both look relatively similar

Ex4

```
The generalization errors of test set are:  134
The average generalization error for the trees =  181.32
```

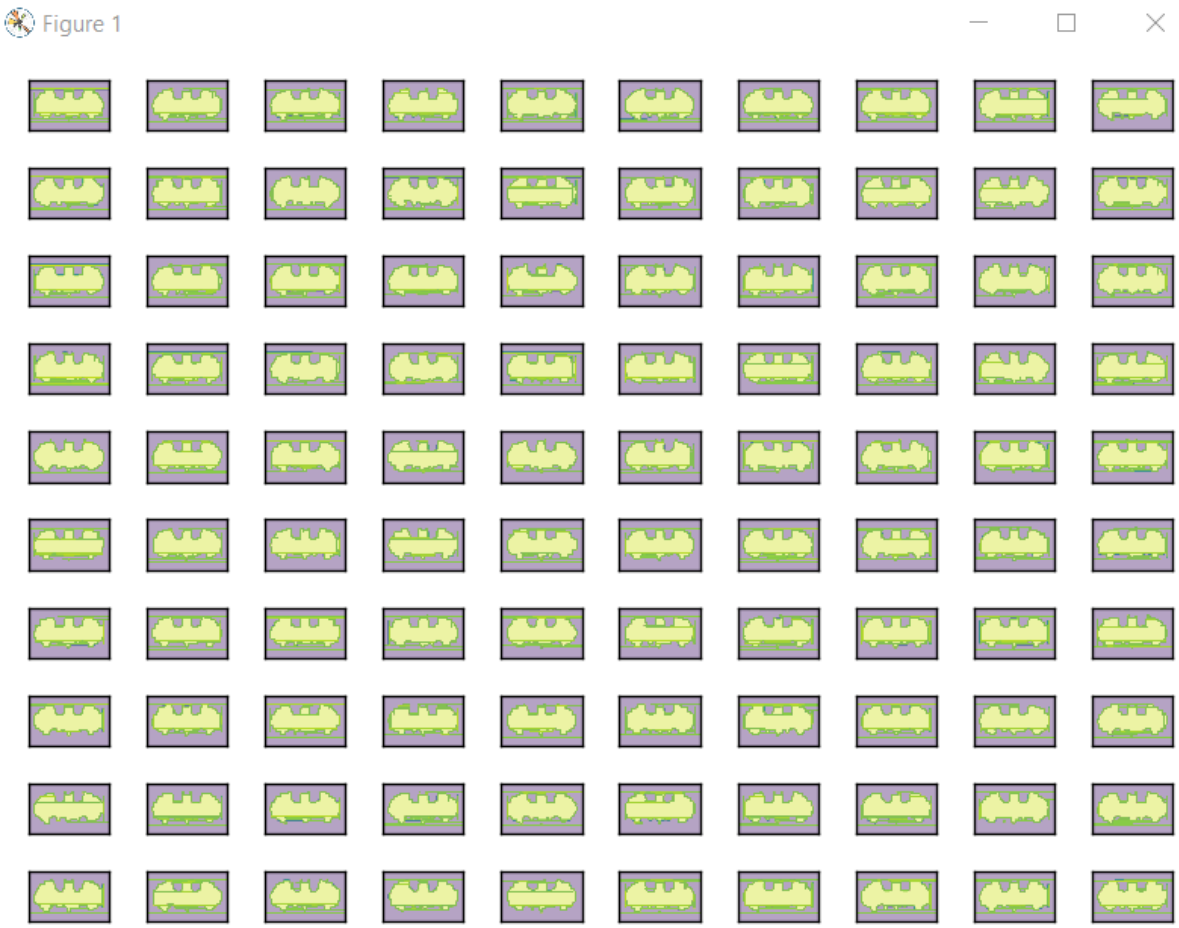
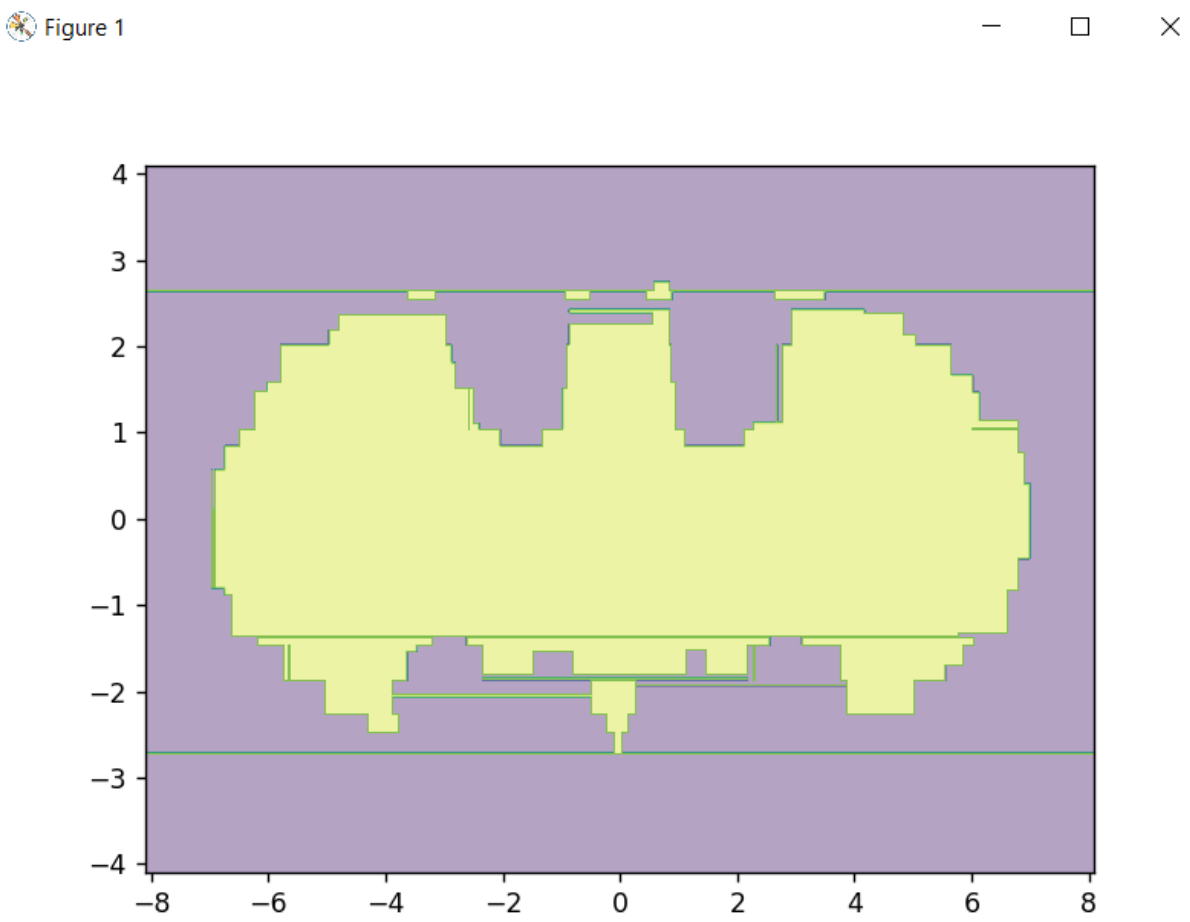


Figure 1

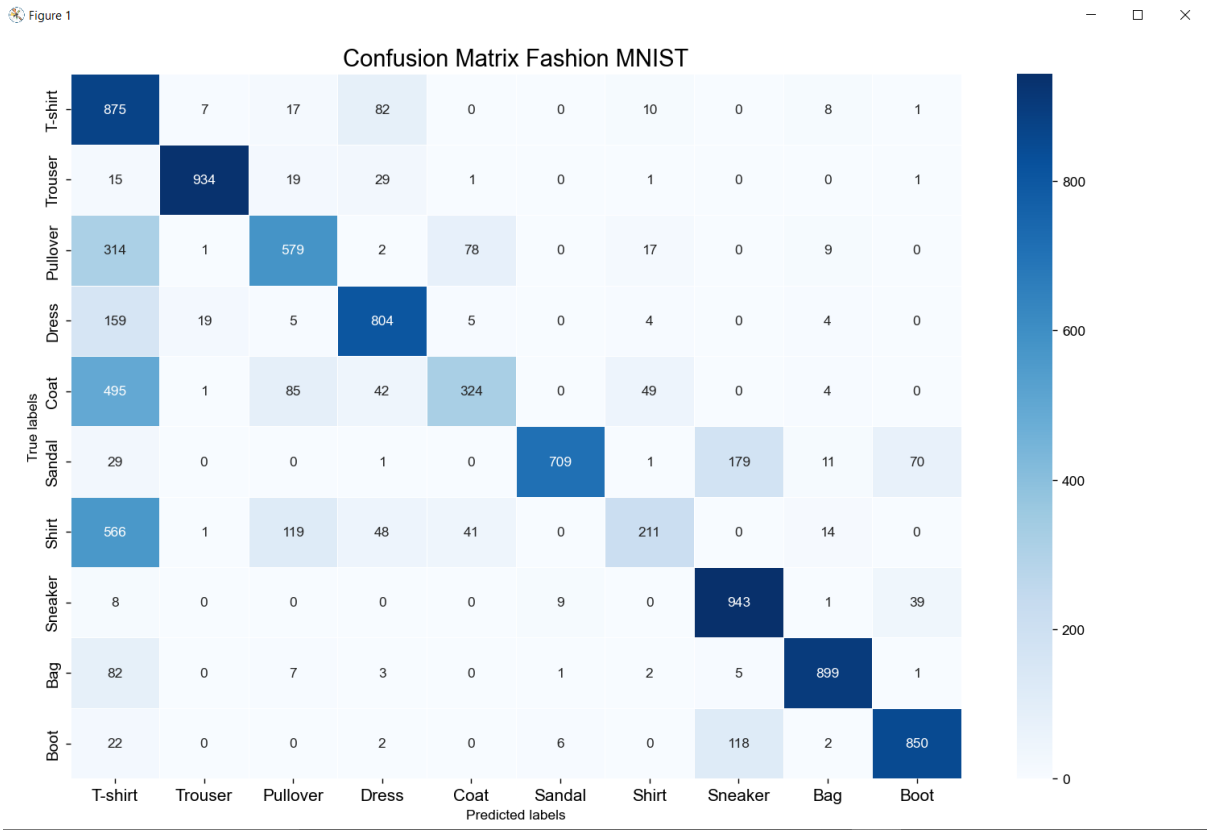


The results look similar to what its mentioned in the exercise so not very surprising, regarding the method its mostly using the out of bag process and kinda effective gathering information since by making short events and looking multiple permutations of these events when combined you can see the effectiveness because it considers most of the data but also contextualized so if it were combined in one case small mistakes would be ignored and so showing signs of overfitting, downsides I suppose that it takes time to gather the results, most exercises here took a while to be fair so not too much of a negative.

Ex5

```
Epoch 1/40
1875/1875 [==============================] - 14s 6ms/step - loss: 0.8055 - accuracy: 0.7128 - val_loss: 0.7245 - val_accuracy: 0.7109
Epoch 2/40
1875/1875 [==============================] - 11s 6ms/step - loss: 0.7645 - accuracy: 0.7084 - val_loss: 0.8343 - val_accuracy: 0.6606
Epoch 3/40
1875/1875 [==============================] - 10s 6ms/step - loss: 0.7549 - accuracy: 0.7110 - val_loss: 0.8937 - val_accuracy: 0.6716
```

```
Epoch 37/40
1875/1875 [==============================] - 11s 6ms/step - loss: 0.6504 - accuracy: 0.7468 - val_loss: 0.6524 - val_accuracy: 0.7521
Epoch 38/40
1875/1875 [==============================] - 11s 6ms/step - loss: 0.6405 - accuracy: 0.7474 - val_loss: 0.6443 - val_accuracy: 0.7530
Epoch 39/40
1875/1875 [==============================] - 10s 6ms/step - loss: 0.6329 - accuracy: 0.7616 - val_loss: 0.6242 - val_accuracy: 0.7695
Epoch 40/40
1875/1875 [==============================] - 10s 6ms/step - loss: 0.6178 - accuracy: 0.7671 - val_loss: 0.6318 - val_accuracy: 0.7689
```



Most mixups are found in the t-shirt category, in general the mixups are mostly found by looking where the apparel its used, so, for instance, anything regarding shoes can confuse each other but not confuse with apparel that its used in another part of the body.