Image Classification
Fruits 360 Dataset

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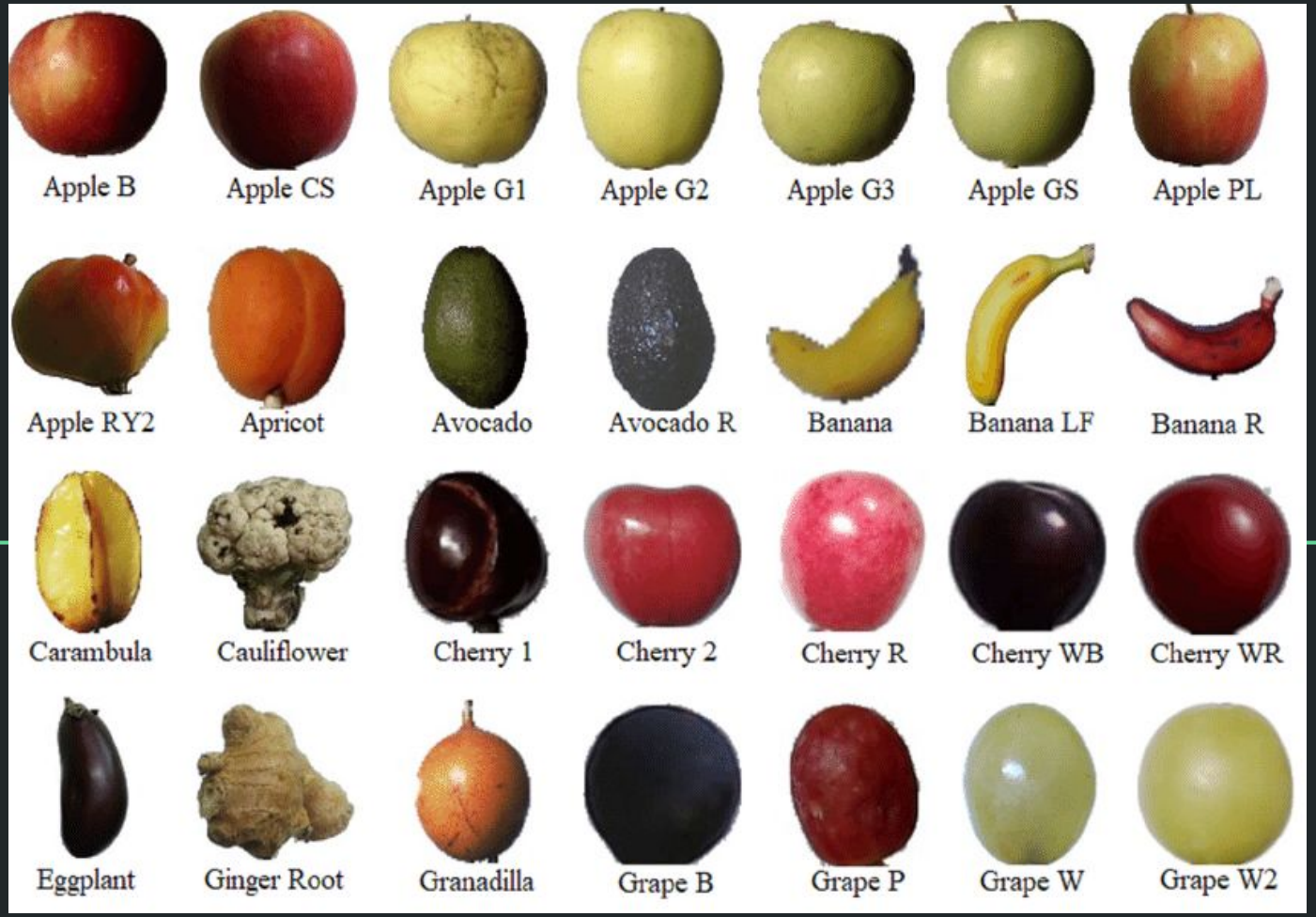
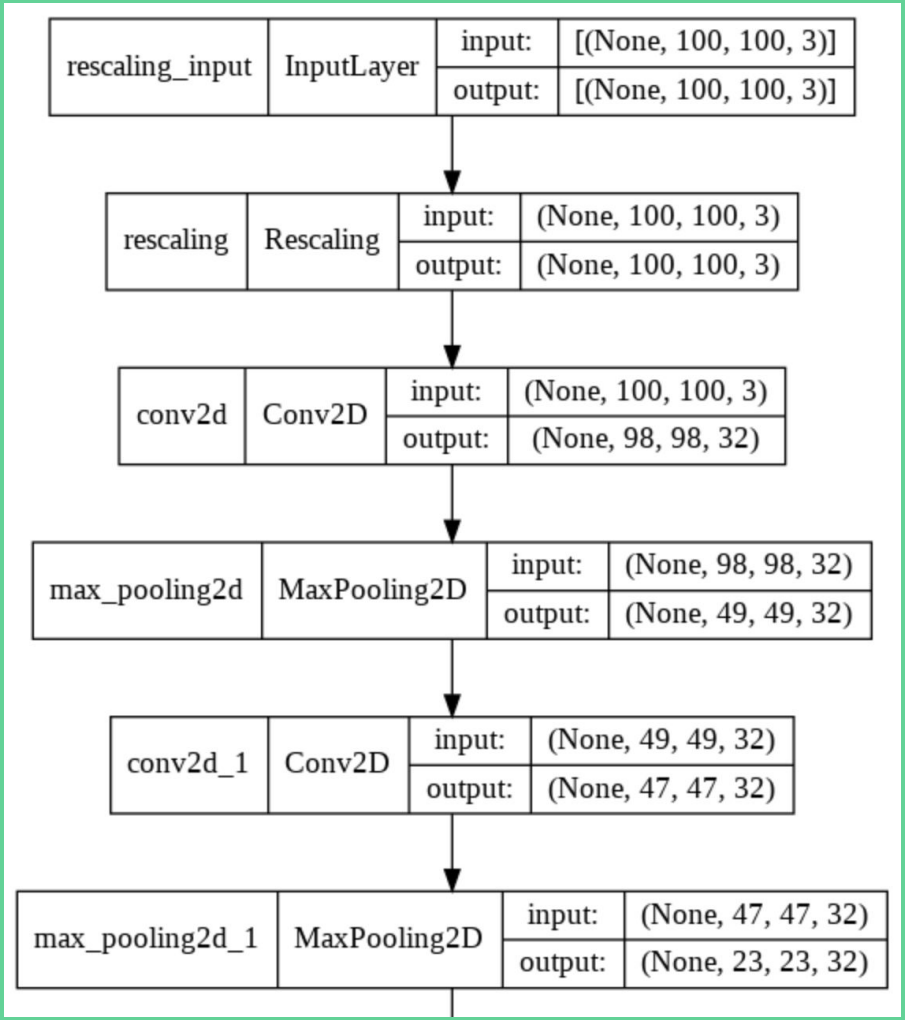
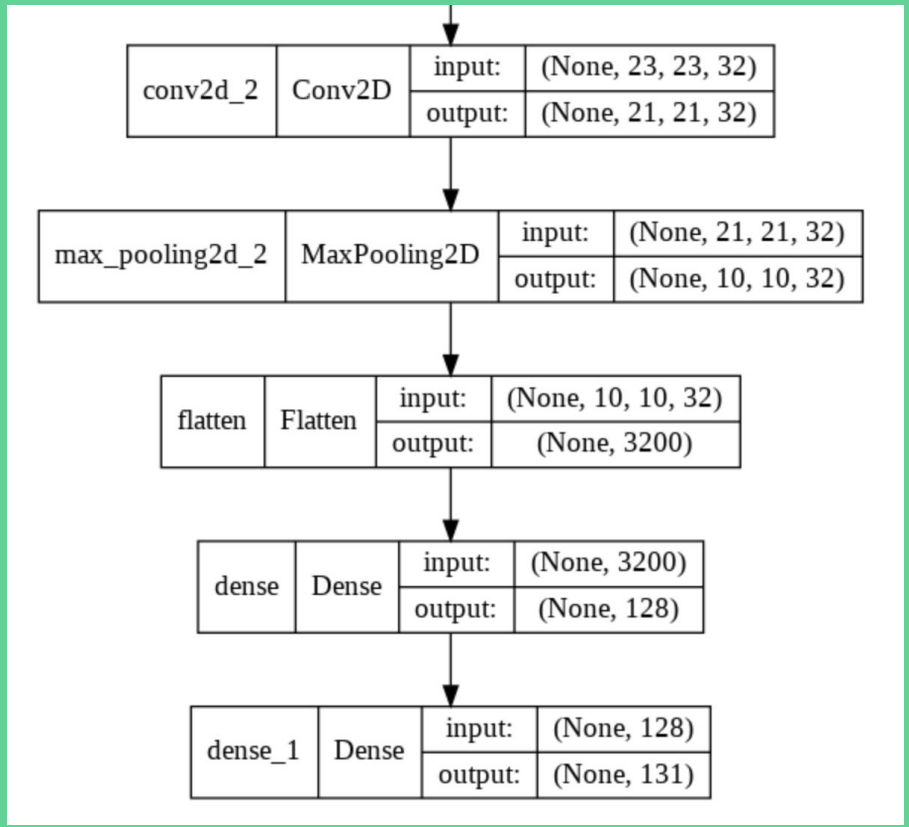
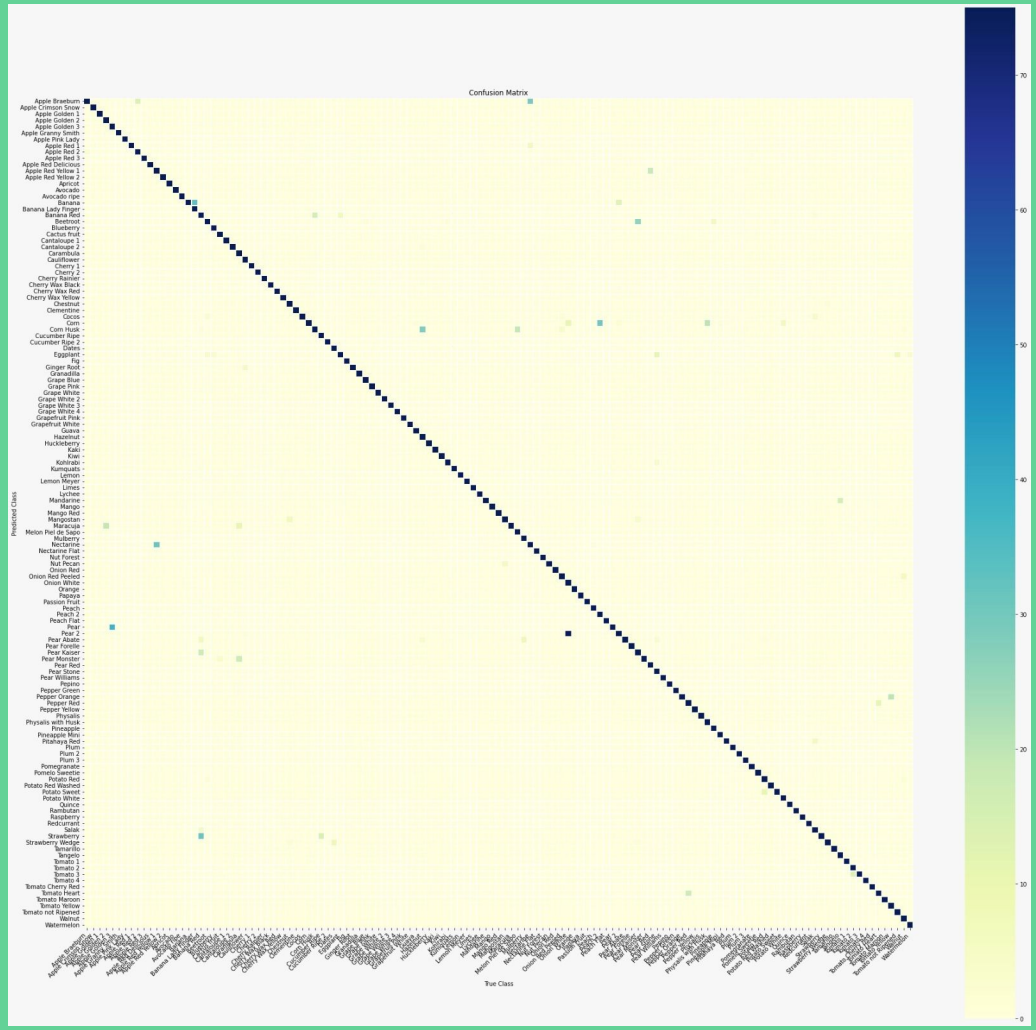

Apple B
Apple CS
Apple G1
Apple G2
Apple G3
Apple GS
Apple PL
Apple RY2
Apricot
Avocado
Avocado R
Banana
Banana LF
Banana R
Carambula
Cauliflower
Cherry 1
Cherry 2
Cherry R
Cherry WB
Cherry WR
Eggplant
Ginger Root
Granadilla
Grape B
Grape P
Grape W
Grape W2


rescaling_input
InputLayer
input: [(None, 100, 100, 3)]
output: [(None, 100, 100, 3)]
rescaling
Rescaling
input: (None, 100, 100, 3)
output: (None, 100, 100, 3)
conv2d
Conv2D
input: (None, 100, 100, 3)
output: (None, 98, 98, 32)
max_pooling2d
MaxPooling2D
input: (None, 98, 98, 32)
output: (None, 49, 49, 32)
conv2d_1
Conv2D
input: (None, 49, 49, 32)
output: (None, 47, 47, 32)
max_pooling2d_1
MaxPooling2D
input: (None, 47, 47, 32)
output: (None, 23, 23, 32)


conv2d_2
Conv2D
input: (None, 23, 23, 32)
output: (None, 21, 21, 32)
max_pooling2d_2
MaxPooling2D
input: (None, 21, 21, 32)
output: (None, 10, 10, 32)
flatten
Flatten
input: (None, 10, 10, 32)
output: (None, 3200)
dense
Dense
input: (None, 3200)
output: (None, 128)
dense_1
Dense
input: (None, 128)
output: (None, 131)

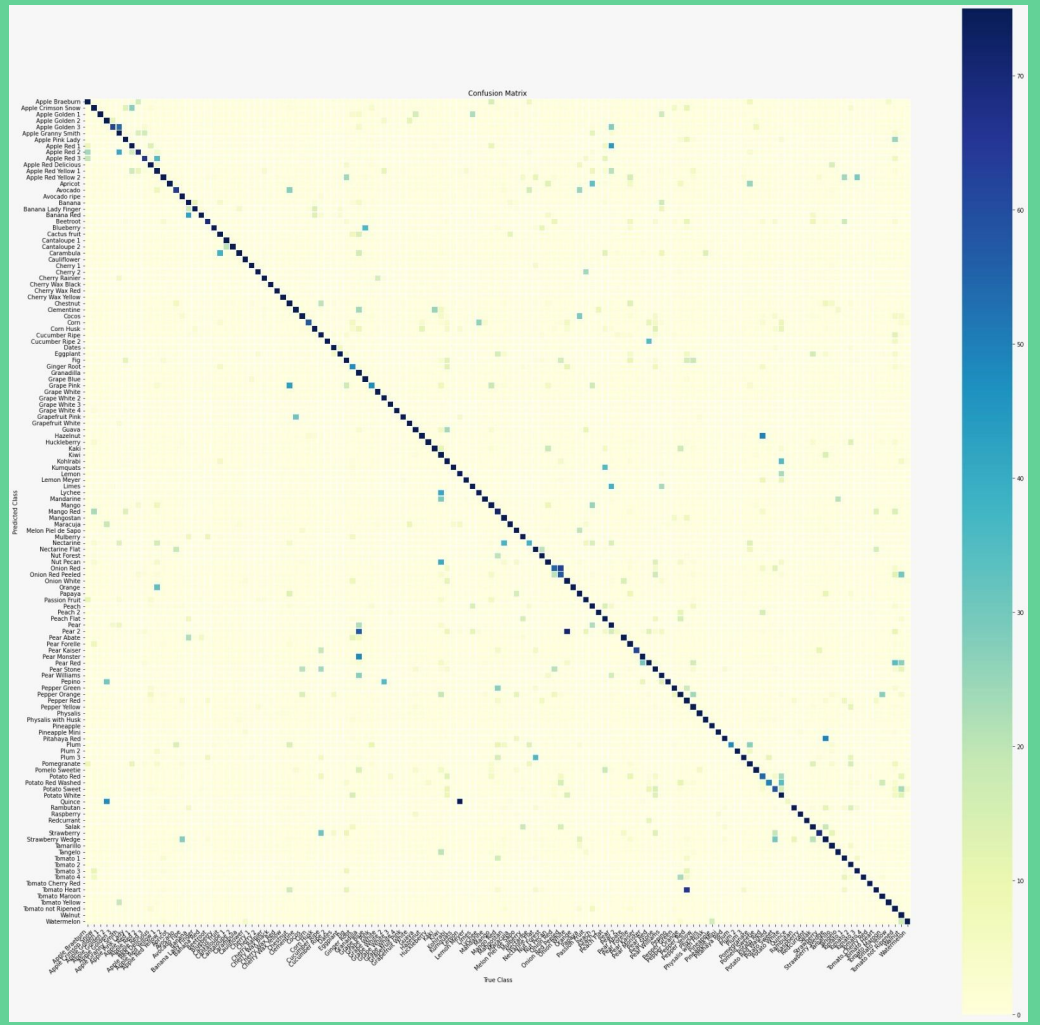
Our convolutional neural network

Accuracy: 96.6%
Precision : 96.8%
Recall: 96.4%
F1: 96.3%



Inception v3 + 2 trained dense layers

Accuracy: 70.6%
Precision : 74.3%
Recall: 70.0%
F1: 69.7%



Conclusions

- Model did well with images from the dataset, but failed to successfully identify handpicked images
  - Could be attributed to the specific formatting procedure in the dataset
- Best CNN unable to generalize well
- Performance of the transfer learning model
  - Not enough data for transfer learning model to be successful
  - Broader model overall, but accurately predicting classes for images in this dataset requires learning specific patterns
- Trade-off between overall robustness/generalizability and accuracy specifically on the Fruits 360 dataset