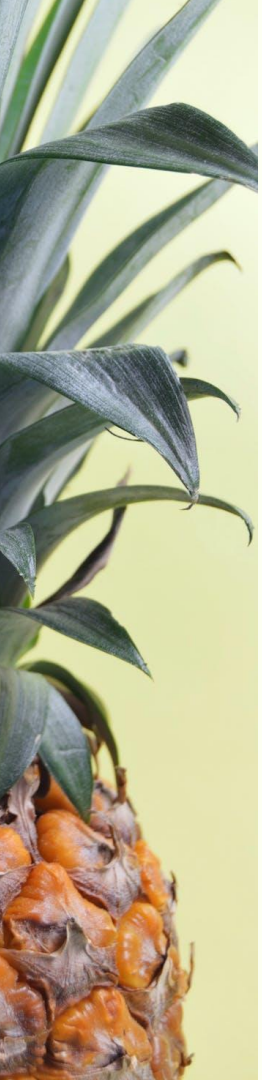
Calories From Food Images

Sprint 2

Overview & Problem Statement

- Nutrition is crucial for mental and physical health
- Counting calories and tracking nutrients can be complicated
- Highly individual

> “There is great opportunity for a machine learning model to provide calorie estimations of foods from images.”



Impact

Poor Nutrition Increases Risk of:

- Type II diabetes, Heart disease, Stroke & Cancer

Optimal Nutrition Increases:

- Ability to achieve fitness goals, mental & physical health

Potential Users:

- Vegans, athletes, over/underweight, education & sustainability

Project Roadmap

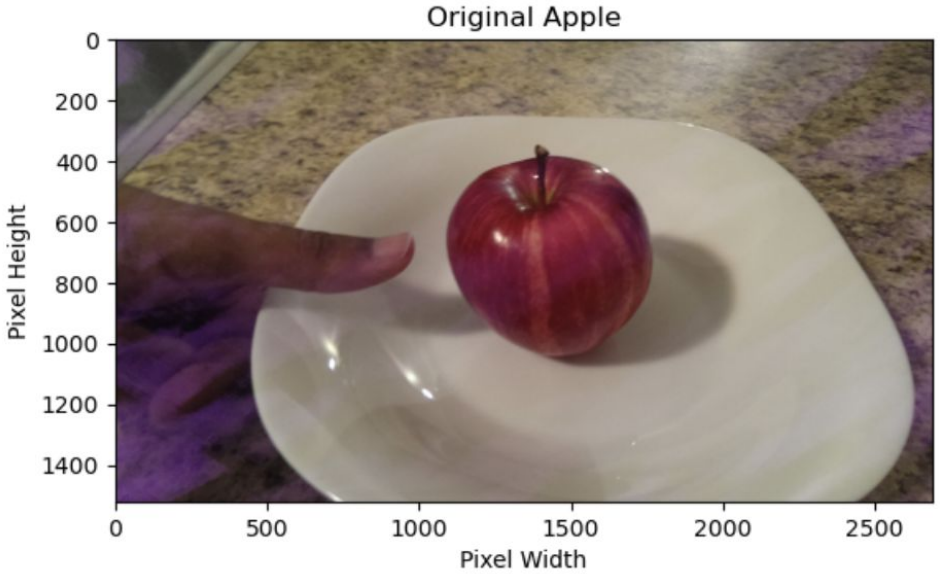
01. EDA and Preprocessing

02. Modify a pre-trained CNN model (EfficientNet B0)

03. Fit Baseline Model and Evaluate

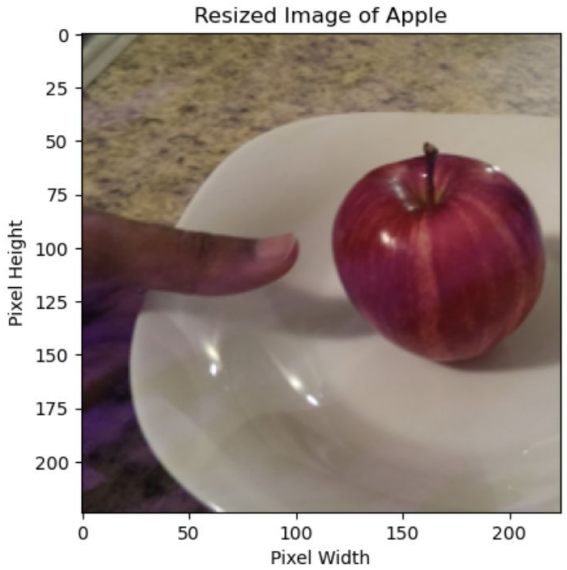
04. Approximate area of thumb to estimate volume of item and calories

Data Cleaning



(1520, 2688, 3)

Inconsistent Height and Width



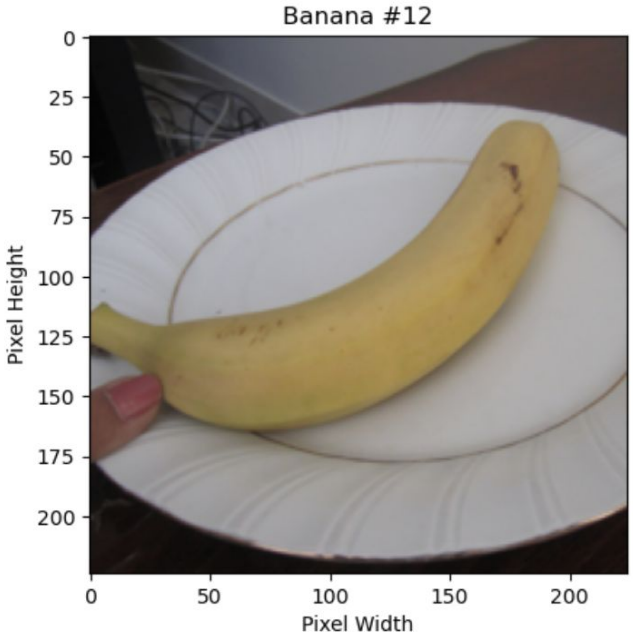
(224, 224, 3)

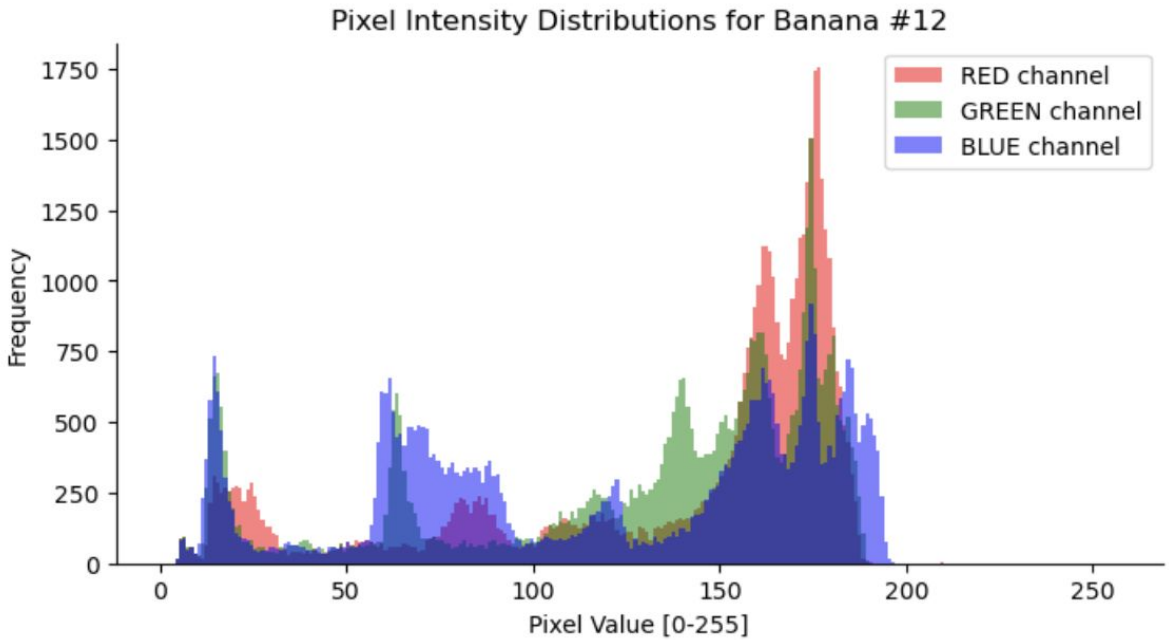
Target Height and Width

16 Unique food classes

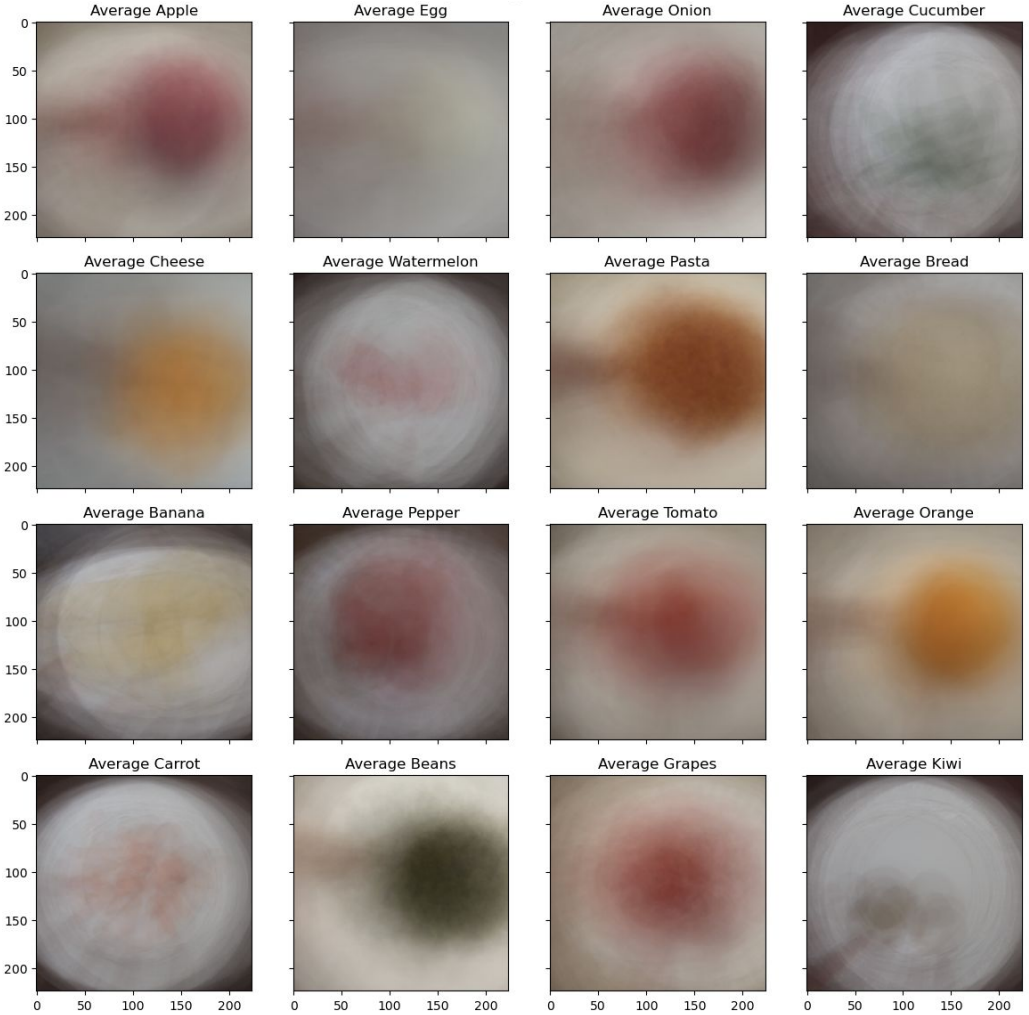
3281 JPEG files converted into one array **(3281, 224, 224, 3)**

EDA: Pixel Value Histograms

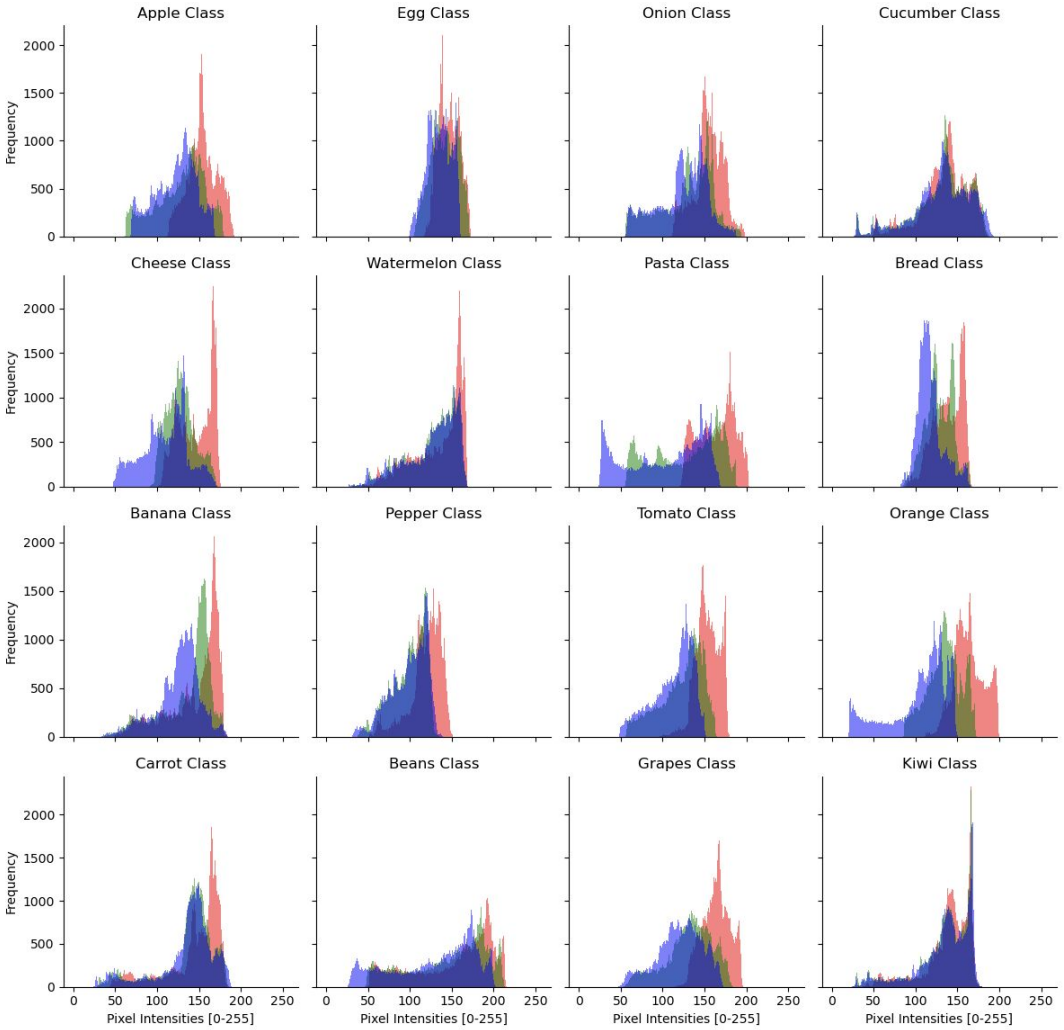




EDA: Average Image From Each Class



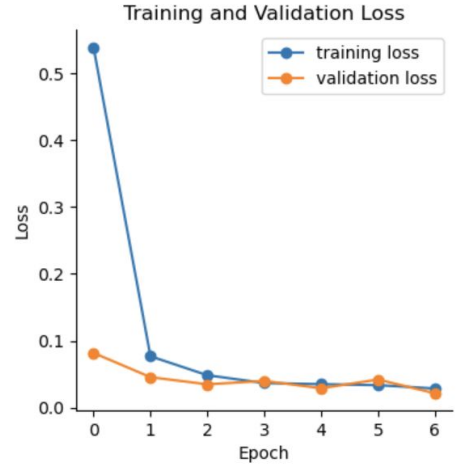
EDA:
Pixel Value Histograms For Every Average Image

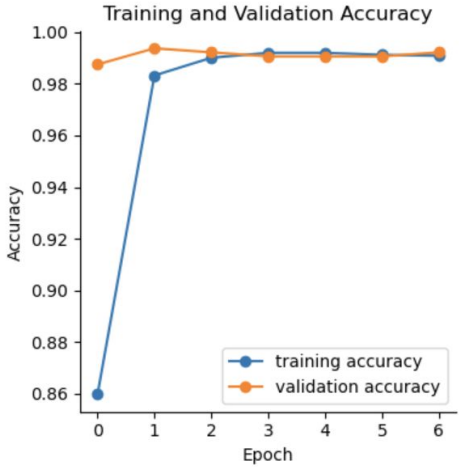


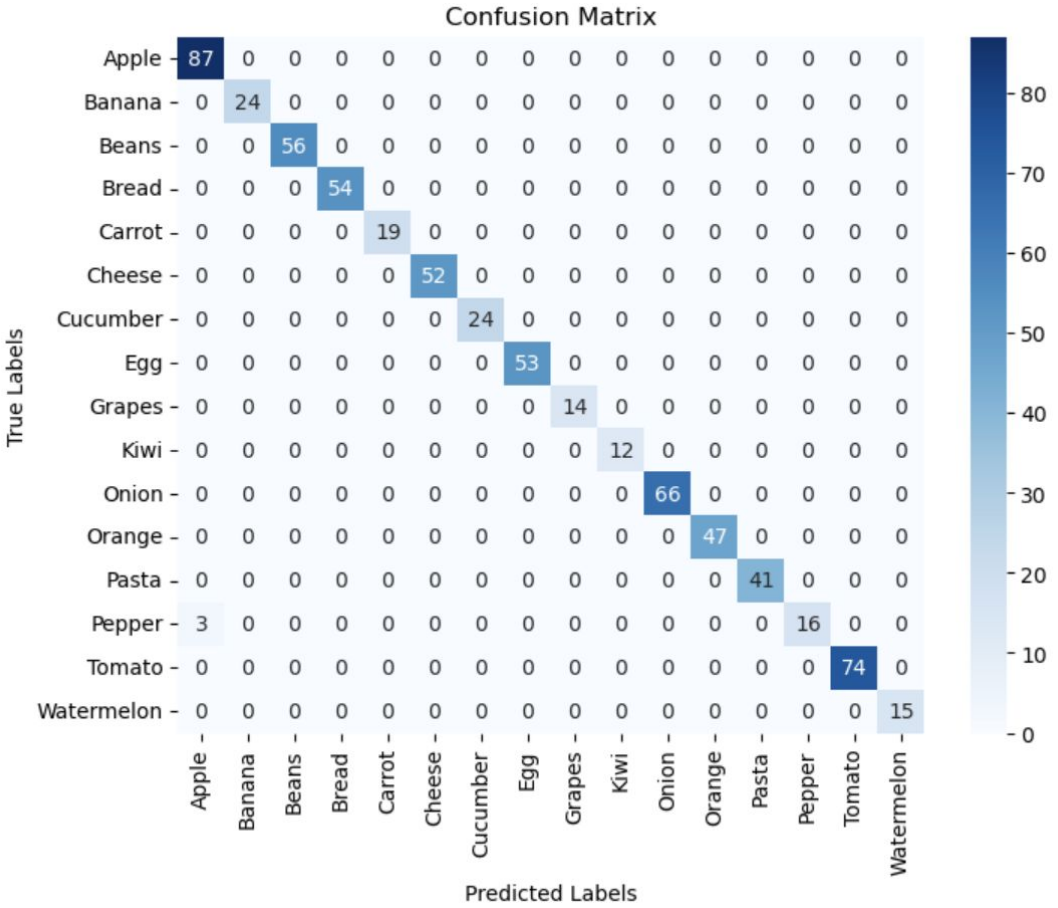
Baseline Model Summary

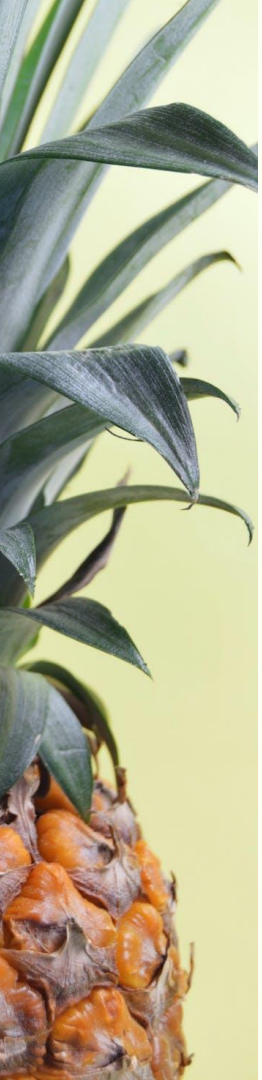
01. EfficientNet B0
    - Base CNN architecture
02. Global Average Pooling Layer
    - Reduces 2D feature space output of EfficientNet to 1D
03. Dense Layer
    - Bottleneck layer to reduce dimensionality of the feature representations
04. Dropout
    - Regularization
05. Dense Layer
    - Matches the number of classes (16 in my dataset)

Baseline Model Evaluation









Next Steps

01. Tune Hyperparameters
02. Use off the shelf Object Detection/Semantic Segmentation model from Tensorflow API
03. Approximate area of thumb and food using one of these models
04. Make predictions on calorie count (no ground truth labels)

Questions?