Preparing the Training Dataset

Before building a custom image recognition model with AutoML Cloud Vision, the dataset must be prepared in a particular format; they include

1. For training, JPEG, PNG, WEBP, GIF, BMP, TIFF, and ICO image formats are supported with a maximum size of 30mb per image.
2. For inference, the image formats JPEG, PNG, and GIF are supported with each image being of maximum size 1.5mb.
3. It is best to place each image category into containing sub-folder within an image folder For example:
   - [image-directory]
     - [image-class-1-dir]
     - [image-class-2-dir]
     - …
     - [image-class-n-dir]
4. Next, a CSV must be created that points to the paths of the images and their corresponding label. AutoML uses the CSV file to point to the location of the training images and their labels. The CSV file is placed in the same GCS bucket containing the image files. Use the bucket automatically created when AutoML Vision was configured. In our case, this bucket is named 'gs://quantum-ally-219323-vcm'. We use the following code segment to create the CSV file used in the cereal classifier example.

```
import os
import numpy as np
import pandas as pd

directory = 'cereal_photos/

data = []

# go through sub-directories in the image directory and get the
image paths
```

```
for subdir, dirs, files in os.walk(directory):
    for file in files:
        filepath = subdir + os.sep + file

        if filepath.endswith(".jpg"):
            entry = ['{}/{}'.format('gs://quantum-ally-219323-
            vcm',filepath), os.path.basename(subdir)]
            data.append(entry)

# convert to Pandas DataFrame
data_pd = pd.DataFrame(np.array(data))

# export CSV
data_pd.to_csv("data.csv", header=None, index=None)
```

5. The preceding code will result in a CSV looking like the following sample:

```
gs://quantum-ally-219323-vcm/cereal_photos/apple_cinnamon_
cheerios/001.jpg,apple_cinnamon_cheerios
gs://quantum-ally-219323-vcm/cereal_photos/apple_cinnamon_
cheerios/002.jpg,apple_cinnamon_cheerios
gs://quantum-ally-219323-vcm/cereal_photos/apple_cinnamon_
cheerios/003.jpg,apple_cinnamon_cheerios
...
gs://quantum-ally-219323-vcm/cereal_photos/none_of_the_above/
images_(97).jpg,none_of_the_above
gs://quantum-ally-219323-vcm/cereal_photos/none_of_the_above/
images_(98).jpg,none_of_the_above
gs://quantum-ally-219323-vcm/cereal_photos/none_of_the_above/
images_(99).jpg,none_of_the_above
...
gs://quantum-ally-219323-vcm/cereal_photos/sugar_crisp/001.
jpg,sugar_crisp
gs://quantum-ally-219323-vcm/cereal_photos/sugar_crisp/002.
jpg,sugar_crisp
gs://quantum-ally-219323-vcm/cereal_photos/sugar_crisp/003.
jpg,sugar_crisp
```

The first part is the image path or URI, while the other is the image label.

6. When preparing the image dataset, it is useful to have a '**None_of_the_above'** image class. This class will contain random images that do not belong to any of the predicted classes. Adding this class can have an overall effect on the model accuracy.
7. Clone the GitHub book repository to the Notebook instance.
8. Navigate to the folder chapter and copy the image files to the GCS bucket.

```
gsutil cp -r cereal_photos gs://quantum-ally-219323-vcm
```

9. Copy the CSV data file containing the image paths and their labels to the GCS bucket.

```
gsutil cp data.csv gs://quantum-ally-219323-vcm/cereal_photos/
```

Building Custom Image Models on Cloud AutoML Vision

In AutoML for Cloud Vision, a dataset contains the images that will be used in building the classifier and their corresponding labels. This section will walk through creating a dataset and building a custom image model on AutoML Vision.

1. From the Cloud AutoML Vision Dashboard, click **NEW DATASET** as shown in Figure 42-8.