

In [1]:

```
import pandas as pd
import numpy as np
import itertools
import keras
from sklearn import metrics
from sklearn.metrics import confusion_matrix
from keras.preprocessing.image import ImageDataGenerator, img_to_array, load_img
from keras.models import Sequential
from keras import optimizers
from keras.preprocessing import image
from keras.layers import Dropout, Flatten, Dense
from keras import applications
from keras.utils.np_utils import to_categorical
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
%matplotlib inline
import math
import datetime
import time
import os
```

In [2]:

```
img_width, img_height = 224, 224

top_model_weights_path = 'birds_fc_model.h5'
from google.colab import drive
drive.mount('/content/drive')
base_dir = '/content/drive/MyDrive/birds/'
train_data_dir = os.path.join(base_dir, 'train')
validation_data_dir = os.path.join(base_dir, 'validation')
test_data_dir = os.path.join(base_dir, 'test')

epoch = 10
batch_size = 1
```

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).