# Homework 1: Classify Cats and Dogs: Test one or more classifiers using either the *classification learner app from Matlab* or OpenCV or *Python and TensorFlow*

**Due: September 21st 5pm EDT**

**To submit to your Google Drive space, under a HW2 folder:**

- **A report on how you solved the problem**
- **Your whole MATLAB code (not snapshots) or your whole Python Code that runs a complete experiment (your best solution) of the cats and dogs problem**
- **The data you used so that we can run the experiment**

Action Items:

1. Find a minimum of 1000 photos of cats and 1000 of dogs (you can add more if needed). You can start by testing 500 vs 500 or less.
2. Resize them to the same x-y dimension (check online how to do that and what the app takes as an input resolution)
3. Extract to a vector, Local Binary Patterns, or HOG features, or both (and concatenate them, after you normalize each pattern vector to have 0 mean and 1 variance)
    a. LBP and HOG: how to extract them can be found in Matlab / Open CV or GitHub
4. Load the classification learner app
    OR
    Prepare the data to run a python script
5. Use data/features from 80%/100% images per class for training; 10% for validation and 10% for testing → you can use any. Number of images you want and can process, 1000, 10K etc.
6. Report the confusion matrix

Notes:

- **Do NOT use deep learning** to solve this problem
- You can report the outcome of one or all classifiers used in your experiments
- The classification accuracy % is not going to be graded. <u>HOWEVER - A reasonable accuracy is expected, typically above 85% minimum.</u>