Capstone 3 project proposal
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Detection of Female and Male eyes using a convolutional neural networks

Objective:
Classify cropped images single eyes as either female or male with high accuracy

Dataset:

- The data was collected to train a model to distinguish between images containing Female eyes and images of Male eyes, so the whole problem is binary classification.

The data is divided into 2 folders:

- The folder `femaleeyes` contains 5202 images and the folder `maleeyes` contains 6323 images for training and testing the model.

The dataset can be found on the `Kaggle` platform at the link below:

- https://www.kaggle.com/pavelbiz/eyes-rtte

Project details:
First rerun a Jupyter notebook submitted to Kaggle for this project, which evaluates 4 different convolutional neural networks. The project is:
https://www.kaggle.com/lucasar/detection-of-male-female-eyes-convnet-92-acc

Rerun details:
Use Google Colaboratory with data files managed on Google Drive to be able to successfully run existing Kaggle Jupyter Notebook

- as of 11-March, have run most of this notebook (except final piece, comparing models)

Next steps:

1. Recreate this notebook restricted to the best performing model, but with following changes:
    - run it on local machine instead
    - code management with GitHub
    - understand model better with extra reporting, like
        - see if can extract hidden layer weights in graphical form, like:
            - http://www.chioka.in/wp-content/uploads/2014/03/features-learned.png
2. Try a Visual Transformer model on this data. (https://keras.io/examples/vision/image_classification_with_vision_transformer/)
    a. possible advantages
        i. ViT models may perform better than CNNs for images
    b. possible disadvanges
        i. longer training time if starting from scratch
        ii. longer project time finding a pretrained model and tuning