# GROUP PROJECT (25 marks, deadline March 22)

## A. VLAD implementation (vs BvoW) on CIFAR-10 (15 marks)

Original Paper:
https://hal.inria.fr/file/index/docid/548637/filename/jegou_compactimagerepresentation.pdf

Gentler tutorial:
https://ameyajoshi005.wordpress.com/2014/03/29/vlad-an-extension-of-bag-of-words/

Reproduce the code for VLAD and compare with Bag-of-words approach used in Assignment 2 . Some experiments can be inspired by the paper

## B. Face Recognition (10 marks)

PART I: IIITB Face Dataset (Internal dataset. Please do not circulate or share)

Please find a dataset useful for performing experiments on Face recognition. Images of same people in different lighting conditions, expression and pose variations. (If the pose is too much away from frontal, you can ignore that image)

https://drive.google.com/drive/folders/1mnxy_cjKhO6zAitG6bh7CtsWH4TW3OPy

PART II Pre-Processing

Explore functions for manipulating images and extracting features. For example,

a. Locate the center of each eye.
b. Rotate and Scale the image so that the distance between the two eyes is 128 pixels.
c. Extract other significant features such as the tip of the nose.
d. Using these features create an oval region corresponding to the face and reset all pixels outside the oval region to a constant value.
e. Try other image analysis functions to familiarize yourself with the software.

Save these processed (256 x 256 pixels) images.

Part III: Face Recognition

1. Implement PCA algorithm for face recognition and test on the IIITB Face dataset. Use existing implementations of LDA, LBP.
2. Split the data as train and test. Experiment to get the best performance as you vary the parameters (for example, by varying the number of Eigen faces retained).
3. Determine (a) Rank 1 accuracy (correct match is at the top of the ranked list), (b) Top 10% (correct match is within top 3), Top third (correct match is within top 10). Calculate these numbers.
4. Submit a concise final report summarizing all the steps (bulleted list) and your observations.