Assignment # 1
(CLO2 -> PLO1)
Digital Image Processing
Objects Analysis Based on Connected component labeling

Submission Deadline: 20th Mar 2017

Note: Students should score 40% in OBE specific questions to ensure their accumulated scores towards respective PLOs are above 40%

Connected component analysis is used for detailed study of different objects given in binary image. It can also be used to extract some fruitful information from corresponding color or gray image for same binary image. You are provided a Gray scaled image. Use this image and connect component analysis to do following tasks

- Convert gray scaled input image into binary image using thresholding transformation. Choose threshold value such that all objects are marked with '1s' and background with '0s'.
- Count total number of objects
- Measure the distance between objects (8 Distance) and remove objects from binary image which are the farthest ones. Calculate distances between centroids (center of gravity) of all objects.
- Use shape based properties such as eccentricity, aspect ratio, perimeter length etc to check whether any specific object has regular/irregular shape
- Make group of objects with similar shapes and give the number of similar groups. Show each group in separate image
- Now also consider the gray image along with binary, and assuming same groups which you detected in previous part, check whether the objects within same group have similar intensity values or not.
- Draw histogram for each object and differentiate between dark and bright objects based on mean and variances calculated from their respective histograms. Show both type of objects in separate images

Add all your files (codes, images and report) in one zipped folder and name it like assignmentNo_Name_ClassSynd i.e. 01_Ahmed_34A. Mail it at **machinelearningeme@gmail.com**

Note: i. Plagiarism leads to zero marks for both parties

ii. No marks for late submissions

iii. Report should not contain any code. It should only contain the outputs interms of images and tables etc.

iv. You can use /commands for implementation

v. You can work in groups which you have already made.