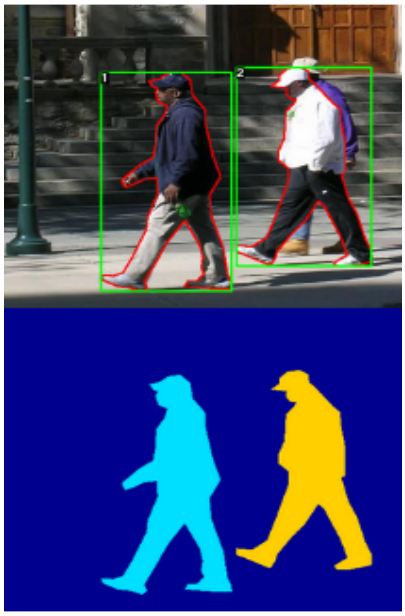
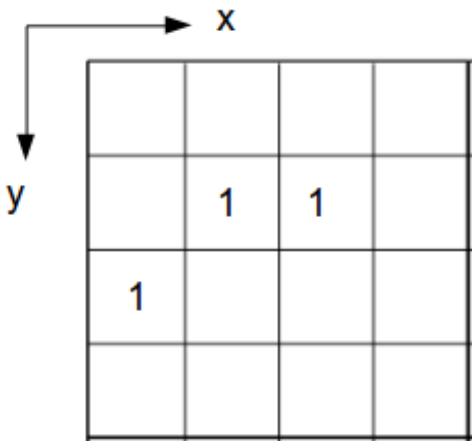
CMPE 258 Final Exam
HL S2020

First Name: _____ Last Name: _____
Student ID: _____ Email:_____ (Total 20 points)

QUESTION 1 (5 points) In deep-face CNN improvement with object tracker as the preprocessing function, shown the following figure is an object tracker tuned for pedestrian localization. Answer the following design questions:

1.1 (3 pts) Compute the x_bar and y_bar (centroid of the ROI bounding box)



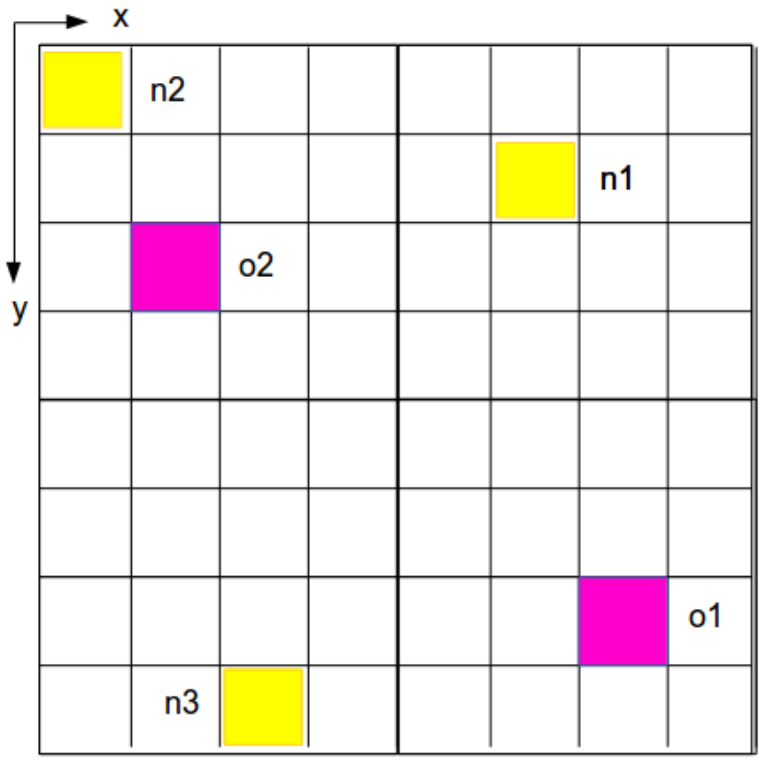


QUESTION 2 (10 points). In deep-face CNN project with object tracker as the preprocessing function, shown the following figure, answer the following design questions:

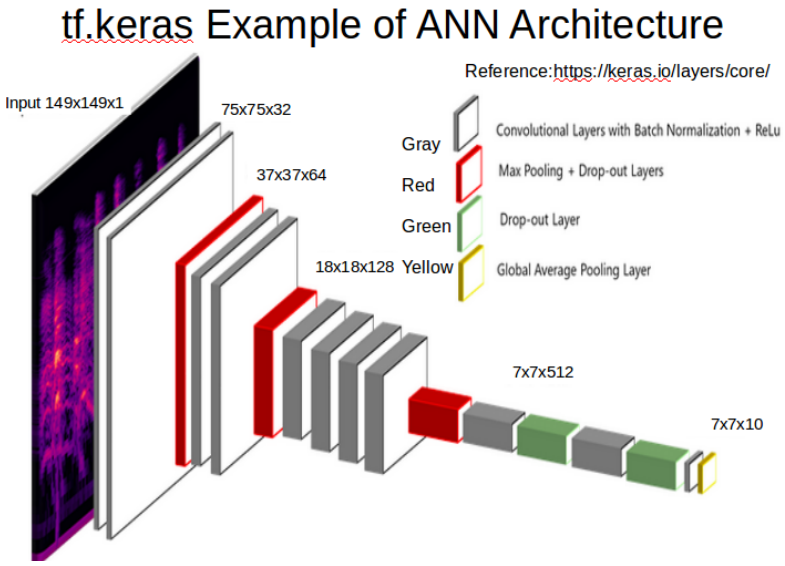
2.1 (4 pts) o1 and o2 are the centers of 2 bounding boxes in the previous frame, and n1, n2, and 3 are the centers of the new bounding boxes at the current frame; find the each and every distance d(o1,n1), d(o1,n2), d(o1,n3) etc for all the older center points o1, o2 to the new center points of n1, n2, n3.

2.2 (5 pts) based on your result, find the matching pair, e.g., find the points from n1, n2, n3 to match the older point o1 and o2 to realize tracking function.

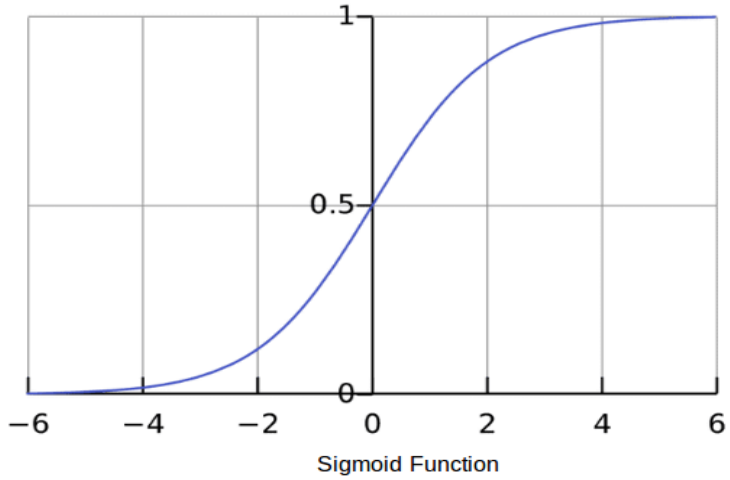
2.3 (1 pt) do you any non-matched point? Which one is it? And explain your answer.



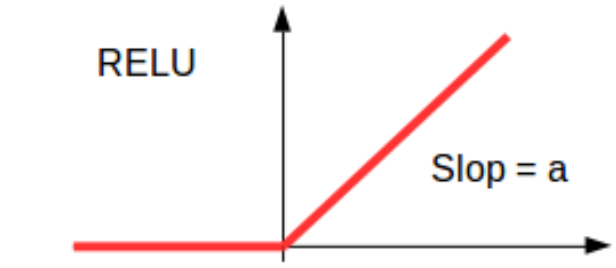
QUESTION 3 (5 Points) Given below is one CNN, answering the following questions:
3.1 (1 pts) Based on CNN architecture given below, explain what is the input image format? (number of channels? Color or gray scale?)
3.2 (2 pts) Find the number of kernels from input 149x149x1 to 75x75x32?
3.3.(2 pts) Explain the function of Max Pooling, given an example how to compute it?
3.4 (1 pt) write one line of python code for TF module to construct a convolutional layer, suppose the size is 28 by 28?
3.5 (1 pt) write one line of python code for TF module to construct a convolutional layer, suppose the size is 28 by 28?
3.6 (1 pt) write one line of python code for TF module to save trained CNN?
3.7 (1 pt) write one line of python code for TF module to load trained CNN?
3.8 (1 pt) write one line of python code for TF module to predict input image for recogntion?



$$\text{MSE} = \frac{1}{n}\sum_{i=1}^{n}(y_{true} - y_{pred})^2$$



Sigmoid Function



(END)