Criterion A:

The problem I am planning to solve is traffic light recognition for autonomous driving. This solution should be carried out by a computer connected to the vehicle’s control and a camera with optical zoom to target only the traffic lamp and include no other irrelevant colors in the frame. All autonomous vehicles will require sensors to detect traffic lights in order to make further decisions, and this program when completed should be able to recognize traffic lamps with the help of a proximity sensor and a radar. The program can be evaluated by checking if the output matches the colors of the traffic lamps as seen by the human eye. The program will require python open-source computer vision and the numpy library to do operations on pictures.

Criterion B

I have designed 2 separate methods to determine the color of each traffic light. The input picture is first blurred to make the second method more accurate.The first one takes in the number of red lights from whatever other sensor, then separates the picture vertically into this many sections. For each section, the program counts the number of pixels that lies within the red light, green light or yellow light range. The second one sums up the number of pixels that lies within the red, green or yellow range in every vertical row of the picture. Then, if in a certain row the number of pixels is significantly higher than both the rows ahead and the rows behind, that row would be marked as the middle of a traffic light and the number of rows will skip ahead to avoid the same light being counted again. According to current tests, the first methods works better.