Research Question

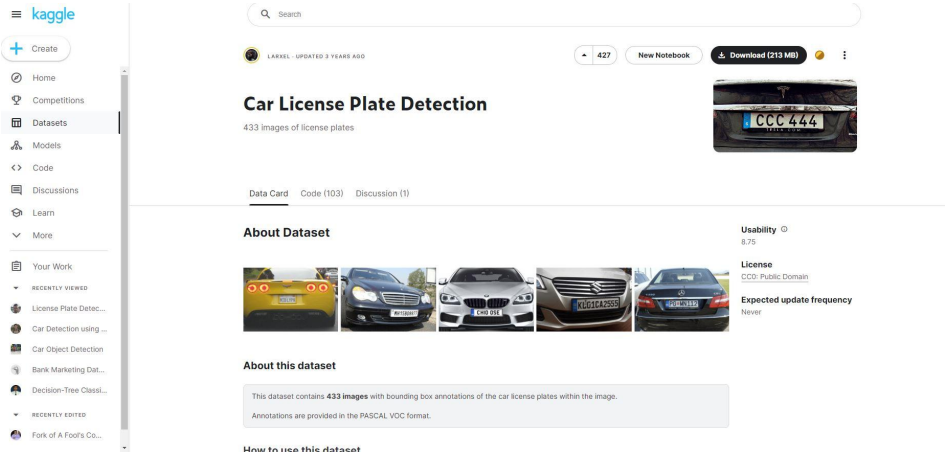
Develop a Model that can detect the presence of license plates on vehicles.

Justification

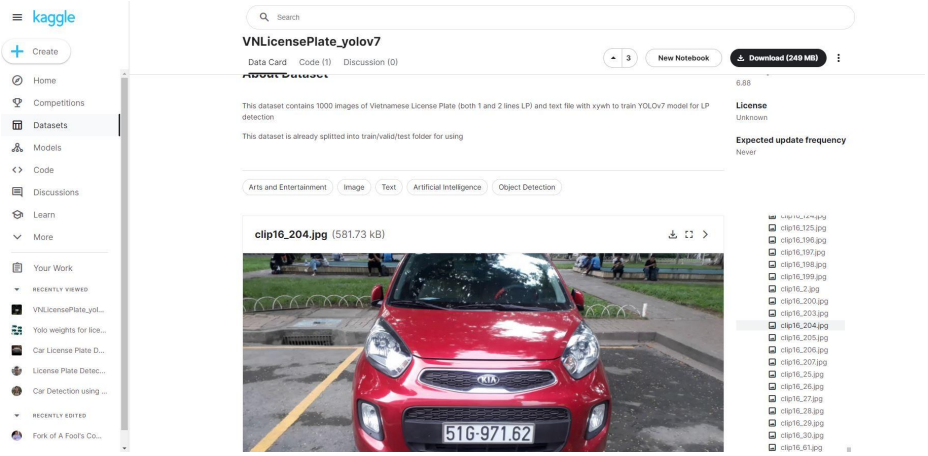
Machine Learning and Artificial intelligence are strong concepts within Data Science that are on the rise and becoming very prevalent within the roles of Data Scientists currently. These models utilize various algorithms (mainly descendants and variations of Gradient Descent) to solve real world problems. One of these problems comes in the form of stolen cars, toll evasions, and Object detection for automated cars. With the knowledge in this model one can not only help with identification of cars, they can also help automated cars better detect each other.

Data Sources

In this assignment I will be using a fusion of two datasets that contain the images of license plates on cars.
https://www.kaggle.com/datasets/andrewmvd/car-plate-detection



https://www.kaggle.com/datasets/bomaich/vnlicenseplate



Combining these two datasets will give me a plethora of images for license plate detection. It is important because by fusing these it allows my training data to be exposed to a variety of types of license plate which would in turn help the data on new images never before seen.

Libraries

For this project I will be utilizing libraries like tensorflow , cv2, keras, matplotlib, numpy, pandas and any other libraries important in upgrading the model

EDA and summary statistics

For our EDA due to the type of dataset we have there isn't much to do regarding numbers until we get to the building of the model. However, When we start to look at the license plates, We can see that they come in various forms and on various vehicles. For example, the bike license plates are different to that of the car. This will be something we will have to accommodate for within our model. This is something that we can actually tackle in our algorithm to account for the difference in shapes of license plates.

Another problem that may arise is the color contrast or that of the model trying to accommodate vehicle shapes and colors. In this we have to ensure that the model is detecting just the plates with the bounding boxes and doing its best to zone out the other information. The problem is not all license plates are identical so I will have to figure out my way around it. Overall this should be a fun and enlightening project!