

# **Feature extraction**

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**Score: 12/10 (I did what was asked  
and tried to explain the physical  
meaning of the numbers)**

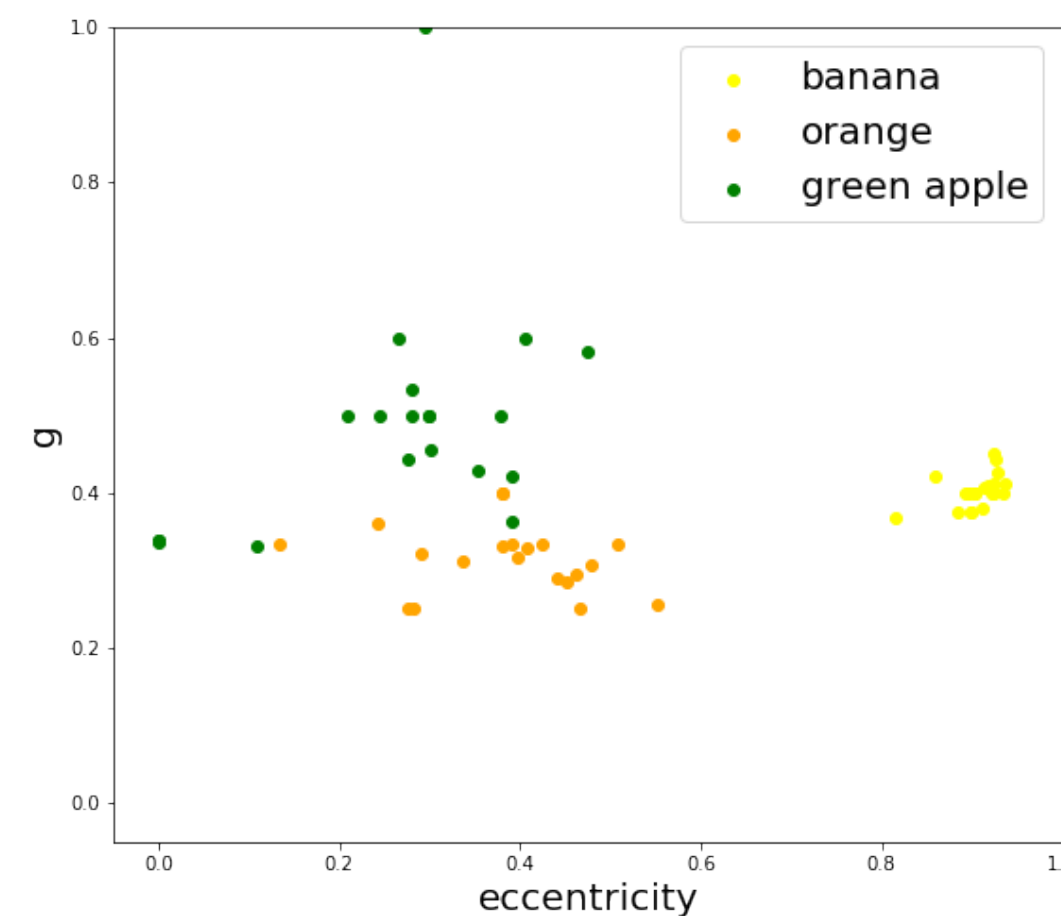
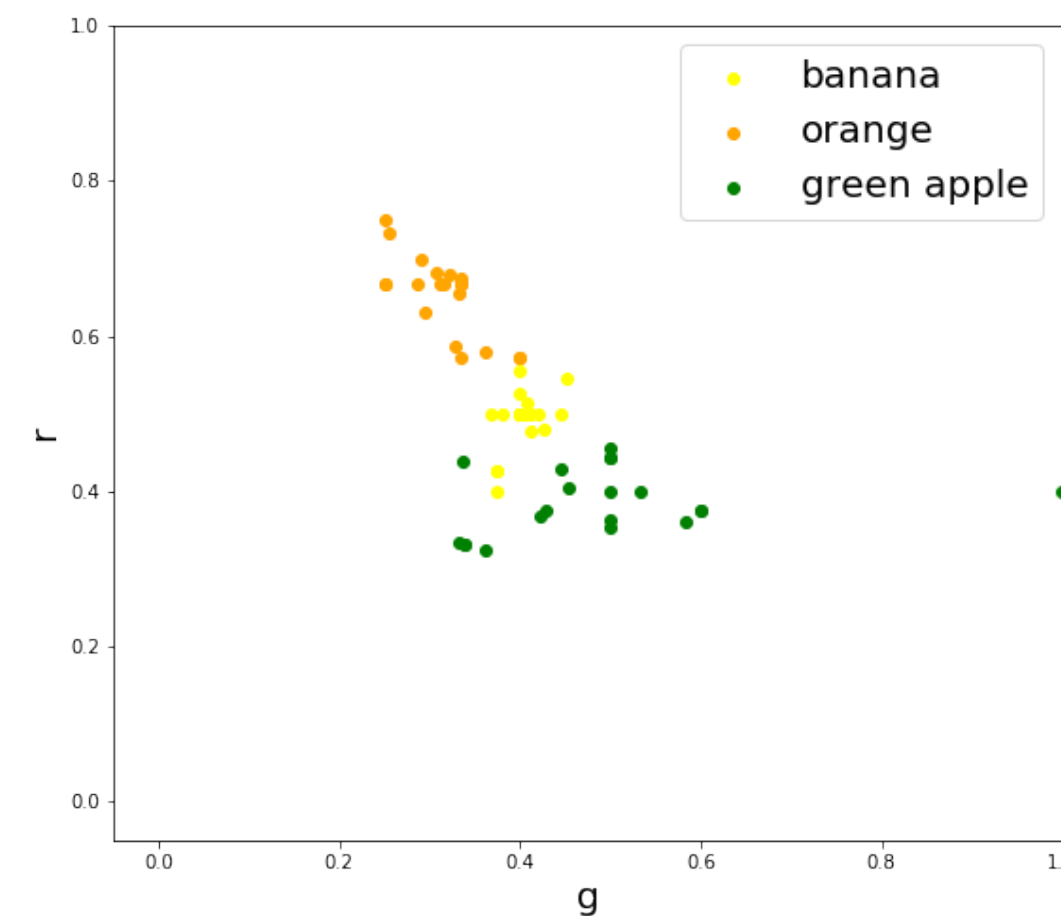
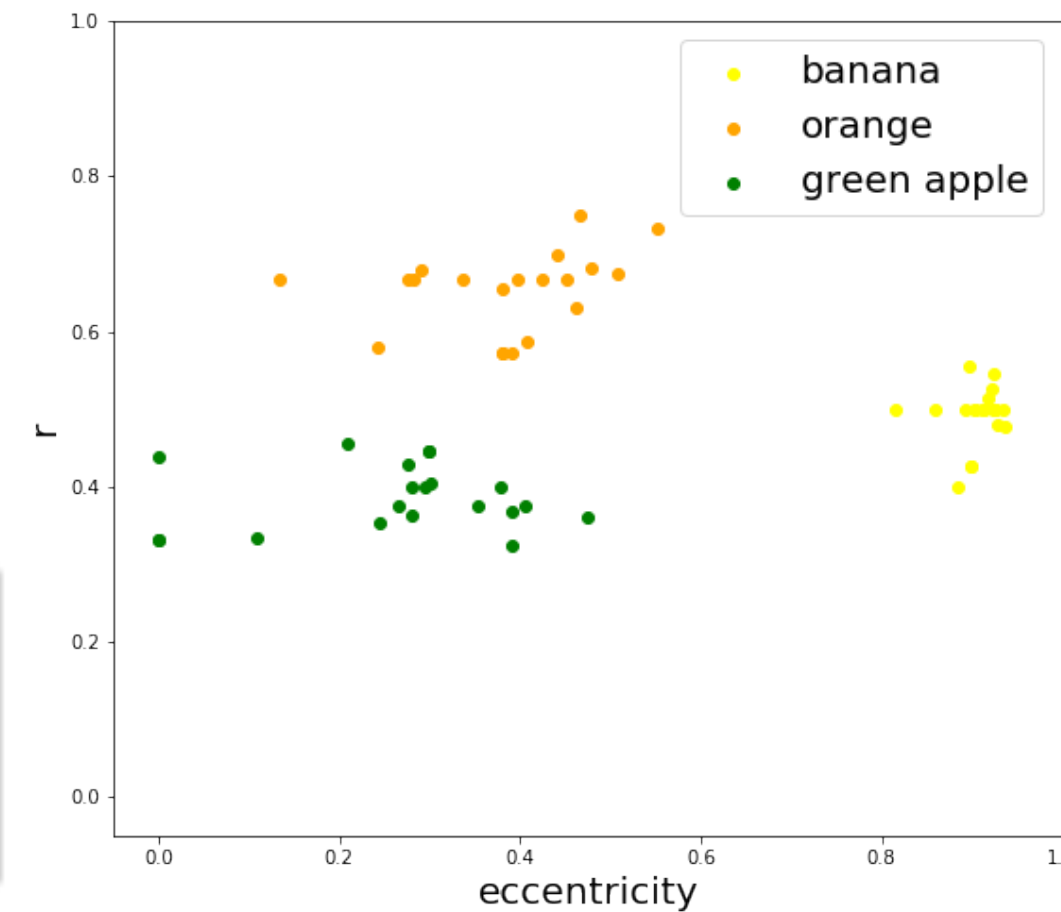
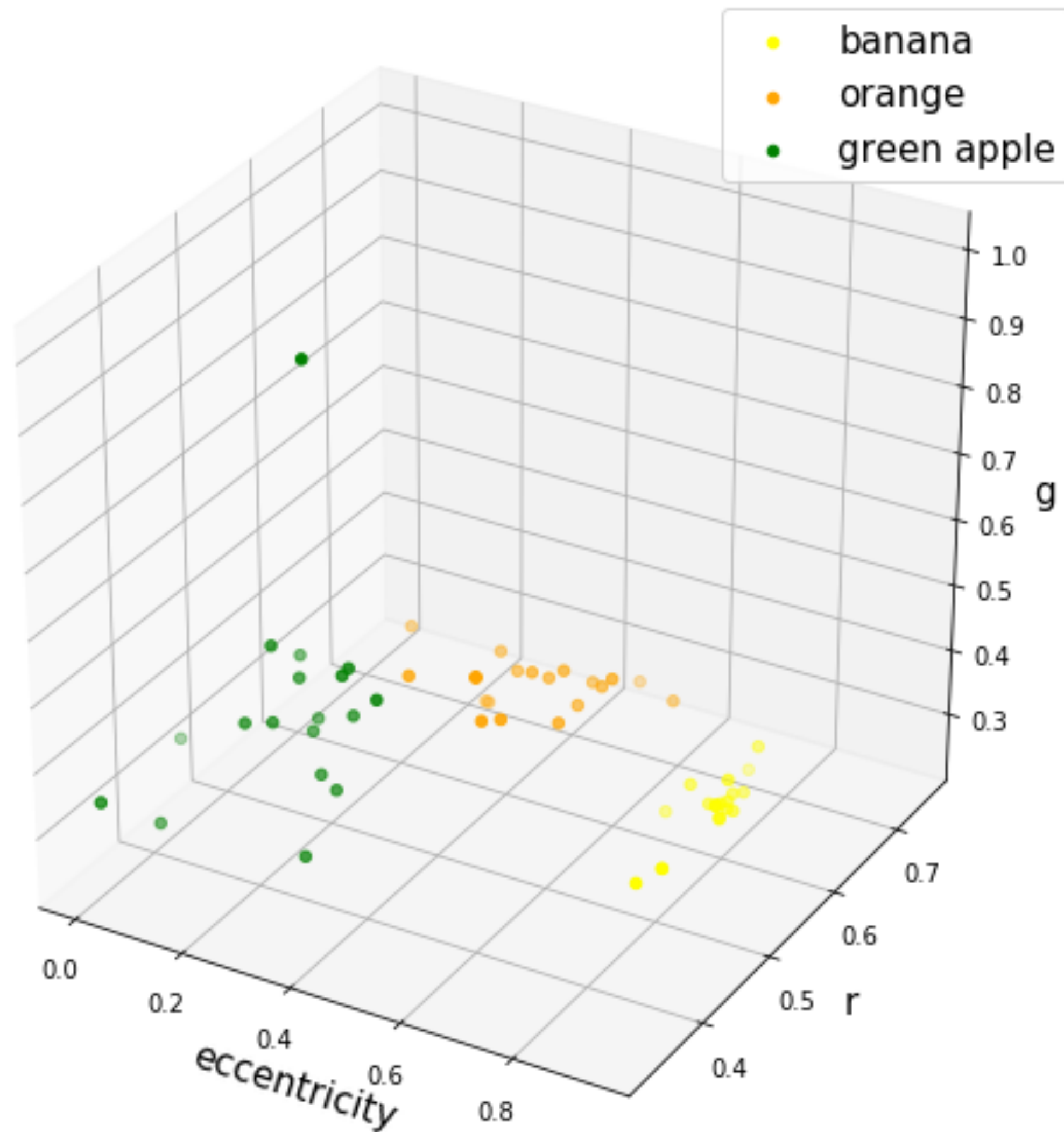
# Data used



The three classes I used are: banana, green apple, and orange. For each class, I used 20 images. I made sure that none of my images were repeated. For each image, the features I extracted were: eccentricity, r and g values.



# Results



From the 3D plot of eccentricity,  $r$ , and  $g$  values, we can already see that data points belonging to the same classes tend to cluster together. Now, I also plotted 3 2D plots. From these 3 plots, we can also see that points belonging to the same cluster are still close to each other. I can also comment that the banana is very distinct when compared to orange and green apple based on eccentricity. Look at the  $r$ - $g$  plot, we can see that we can not conclude anything since all the points are gathered in the center (even if they still look separated, it is hard to say so). Another observation is that the orange and the green apple have similar shape (just in case you don't know) because they have the same range of eccentricities. An outlier of the green apple class can be seen, the  $g$  value has a very high value. This outlier can be accepted because it does make sense that a green apple has a high  $g$  value.