

Lab4

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1 Introduction

This is a lab report for building a simple manual classifier to classify between broken and whole grain rice. The rgb images of broken and whole rice grains are converted to simple black and white border pixels. Then areas and major and minor axis ratio are computed on the transformed images. We then plot the broken and whole rice grains as a function of their area. From the plot a manual regression line threshold is set and we test our manual threshold on test data and observe the confusion matrix to see how well chosen our manual classifier is.

2 Results

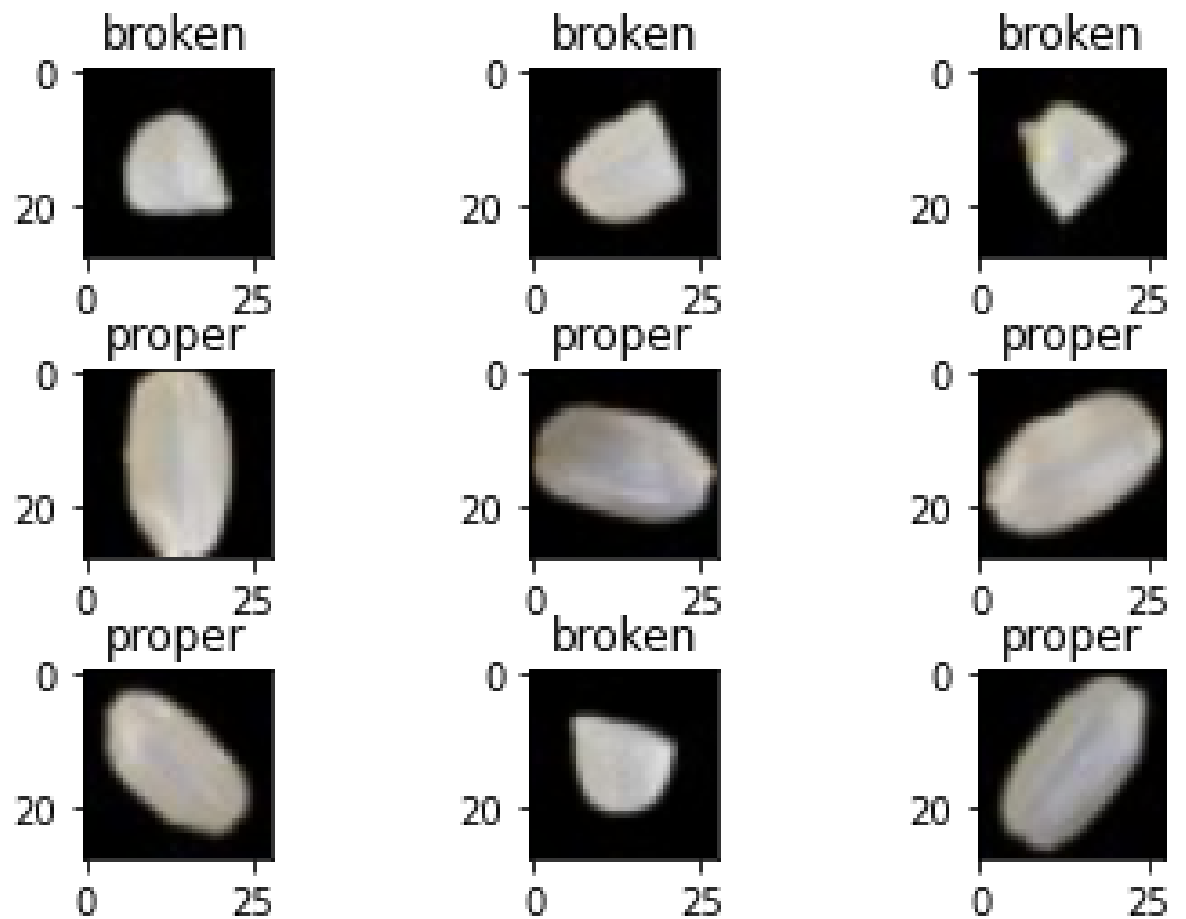


Figure 1: Figure showing sample rice grains from the database for both broken and whole that are used in this classification project

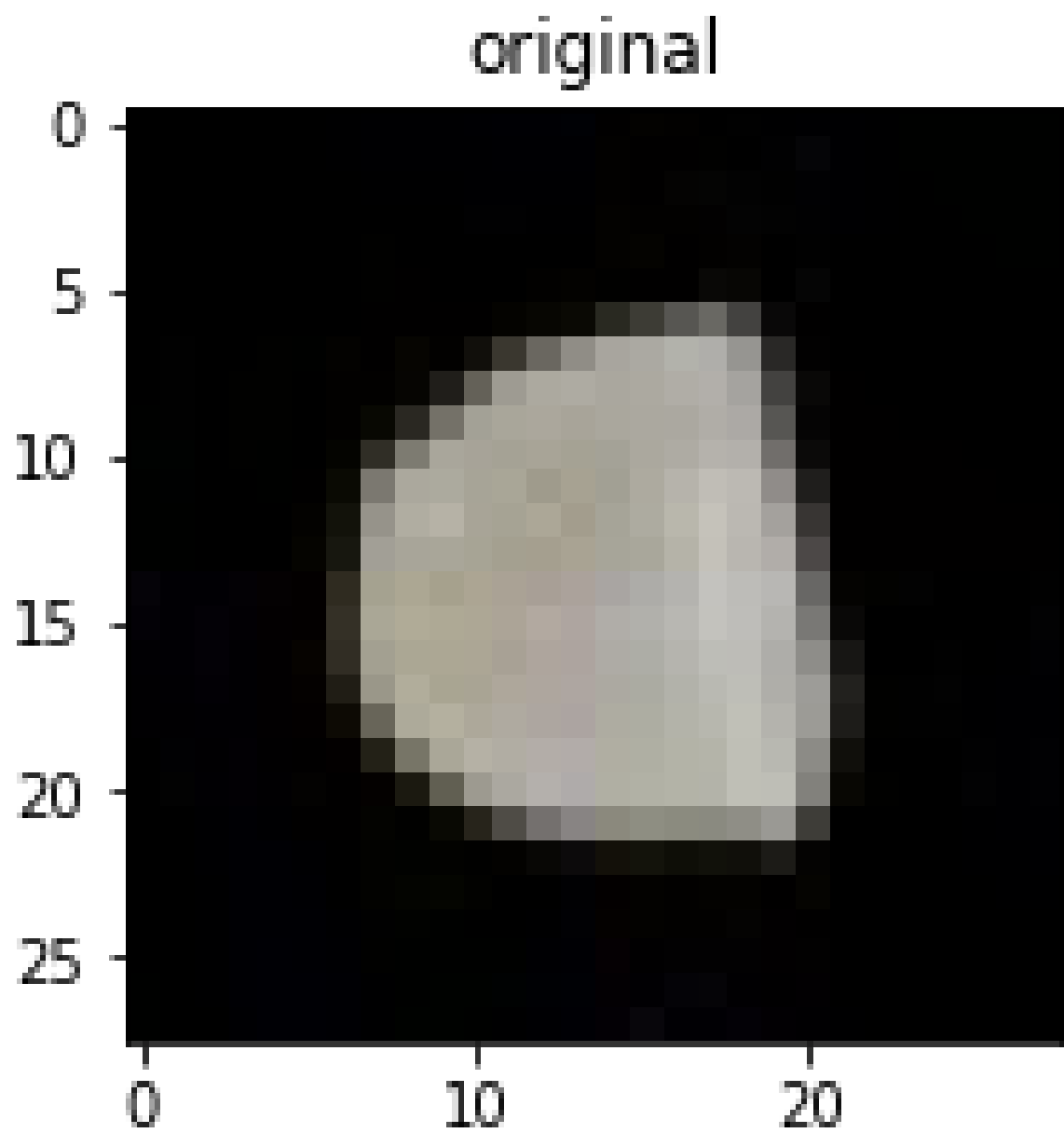


Figure 2: Figure showing a broken rice grain that is later converted to greyscale and then simplified into black and white pixels to give a polygon shape.

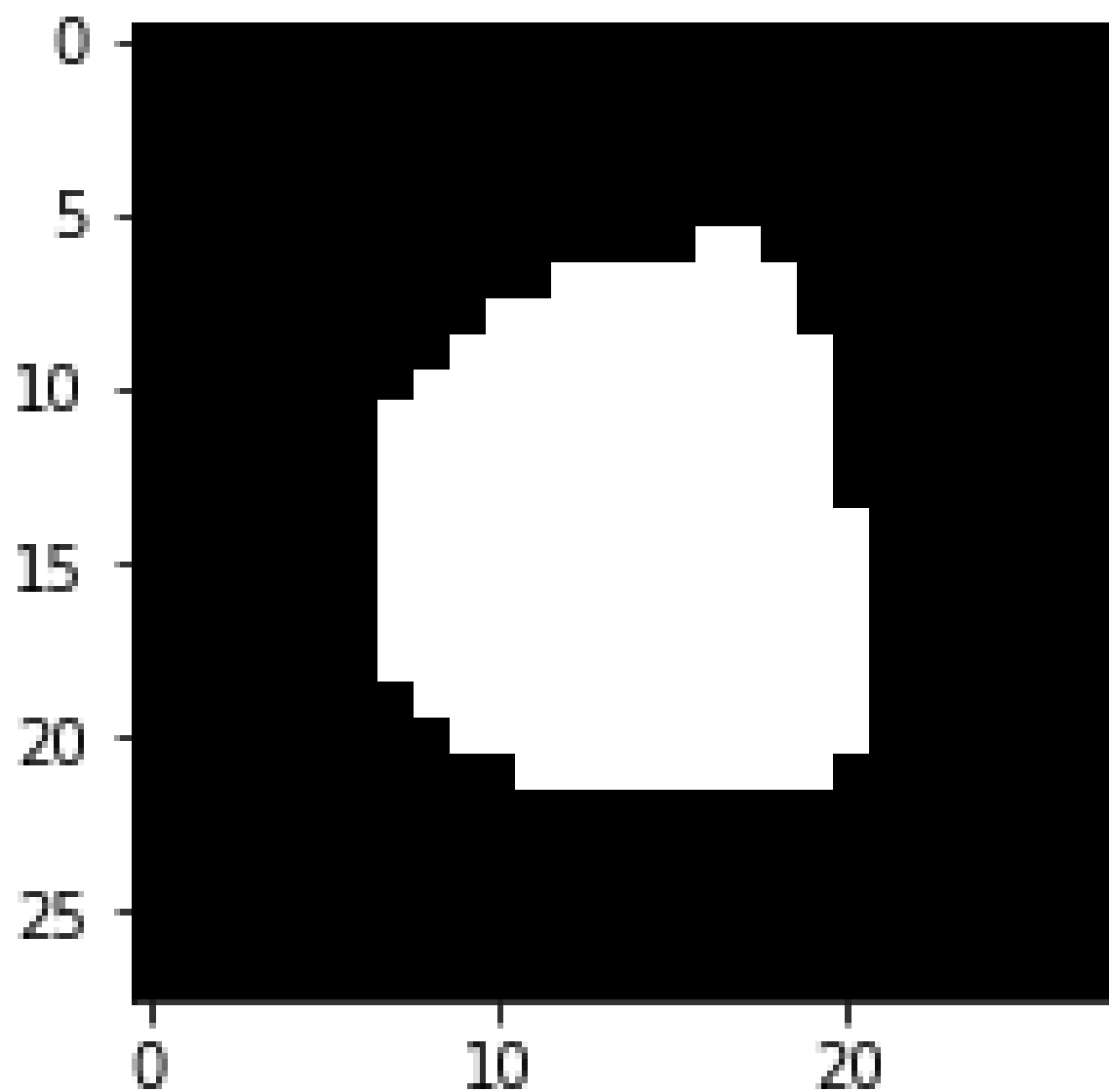


Figure 3: Figure showing final image transformation that is used for area and major and minor axis calculation using tools from scikitlearn

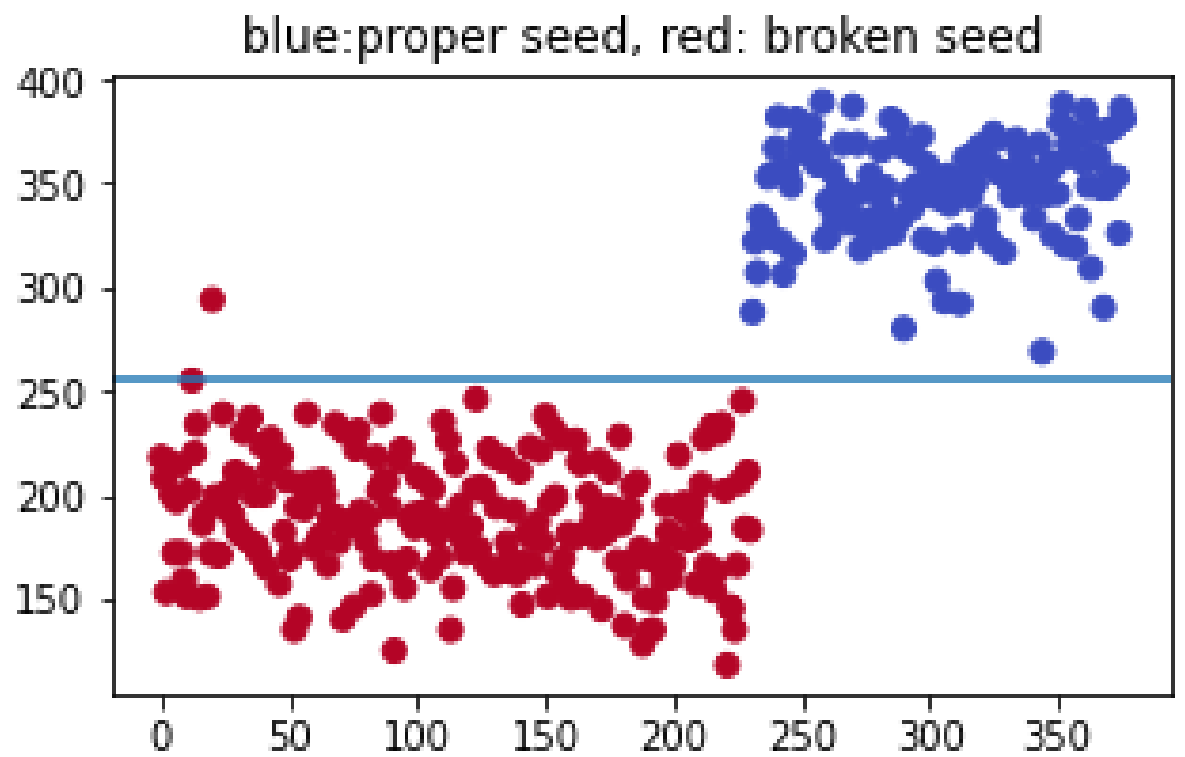


Figure 4: Figure showing scatter plots of broken and whole grain rice in the dataset as function of the area. There's a clear separation between the broken and whole rice grains in the plot. A manual threshold is set at 256 to serve as a classifier between broken and whole rice grains. This is indicated by the blue line

Confusion matrix

True label	Predicted label	
	proper	broken
proper	146	0
broken	1	230

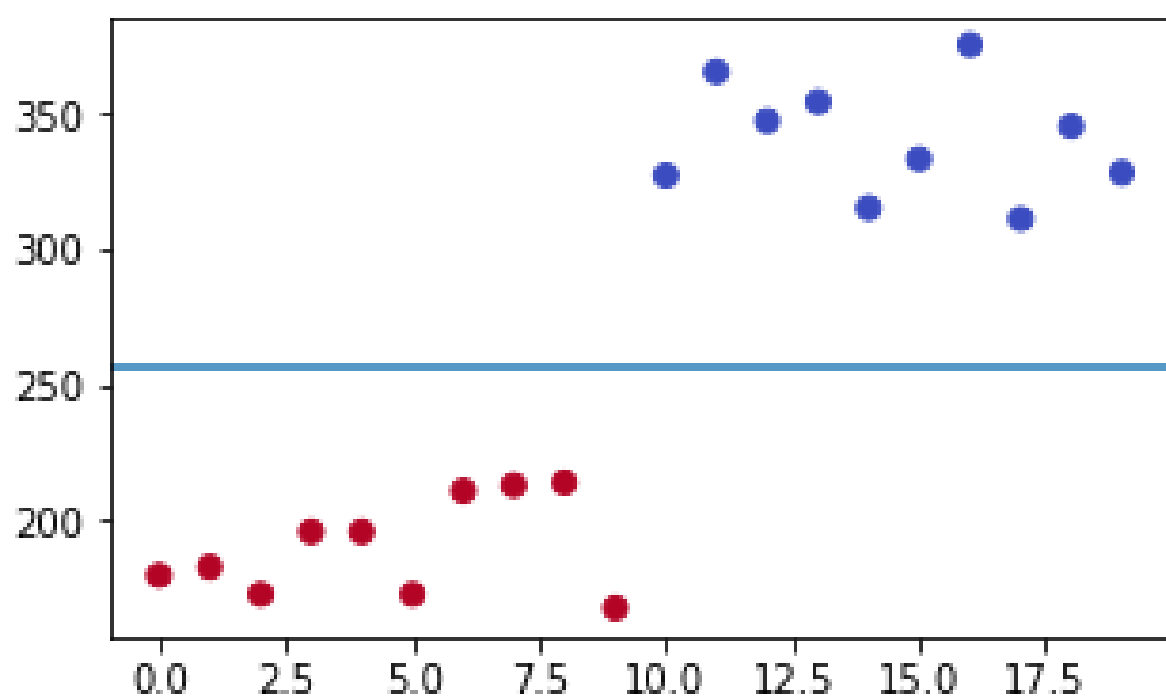


Figure 6: Figure showing scatter plots of broken and whole grain rice in the Test dataset as per their area. The blue line shows the manual classifier threshold

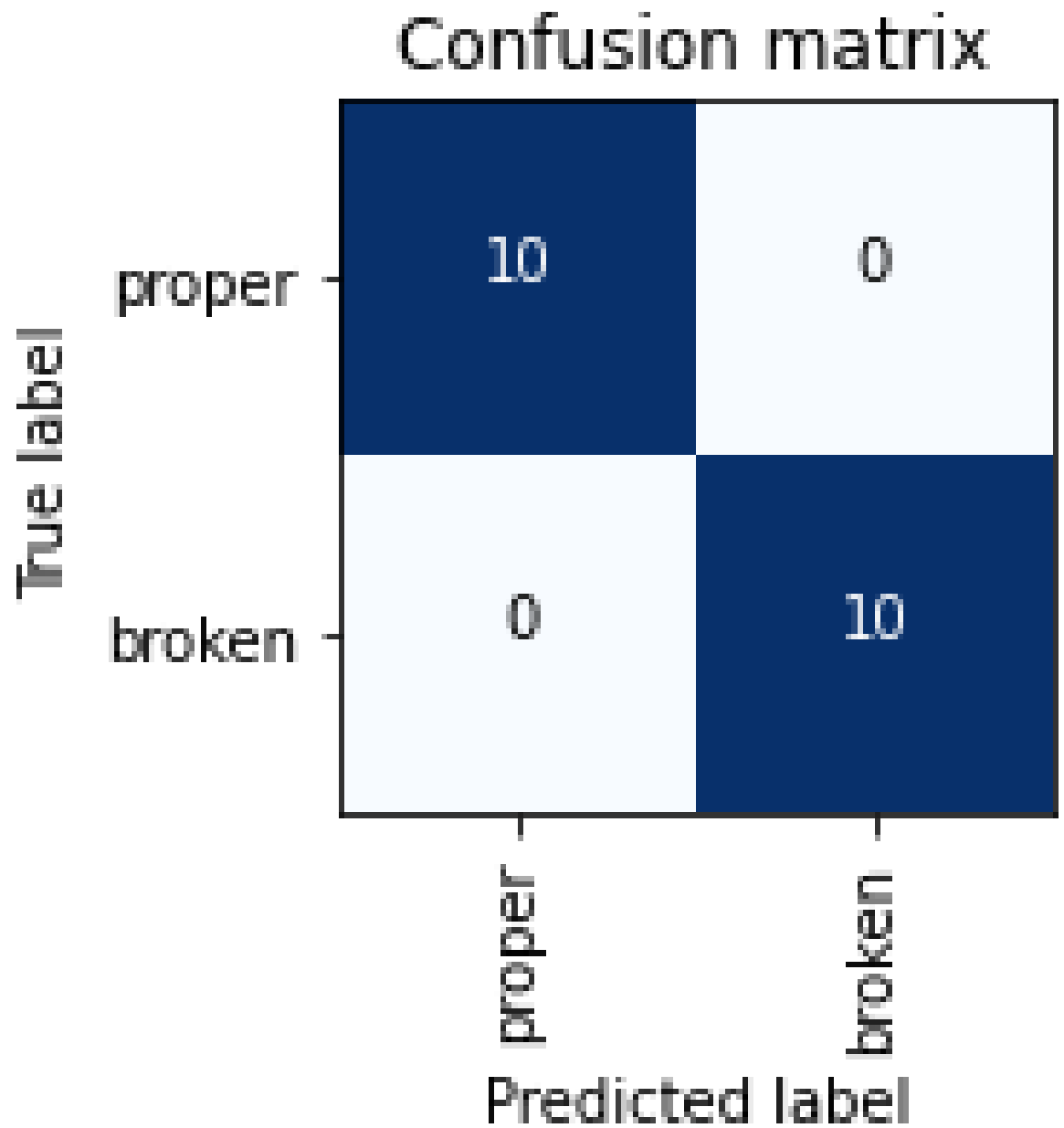


Figure 7: Confusion matrix scores plotted for the test dataset. 100% accuracy is achieved