



# PROJECT 1 REPORT

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First, getting features of each image (feature extraction), in both dataset (ones and zeros). Accordingly, there will be (number of trainings zero images \* 2) zero features, also (number of trainings one images \* 2) one features.

Image / feature	Feature 1	Feature 2
<b>Zero</b>	Mean of brightness	Standard deviation of the brightness
<b>One</b>	Mean of brightness	Standard deviation of the brightness

Then calculate the mean and variance for each class (zero and one), and for each feature, by getting the average of all mean of brightness of all images for each class, and the variance of all images for each class (variance = standard deviation power of 2).

So, we will have 8 values to be used in Naïve

Image / feature	F1 Mean	F1 variance	F2 Mean	F2 variance
<b>Zero</b>	44.170859949	115.219647087	87.3893842791	101.86257792
<b>One</b>	19.3631954082	31.5635775176	61.3402865212	82.7732590386

To classify each image, we need to calculate the probability for the test image given zero as class and given one as class, then compare the two results. The class will be the greater value of both.

For Example: if  $p(f1 | zero) * p(f2 | zero) > p(f1 | one) * p(f2 | one)$ , so this class is zero.

The accuracy is calculated by the number of correct ones in one test dataset divided by total number of images in the dataset, same to zero class.

Class	Accuracy
<b>Zero</b>	0.9173469387755102
<b>One</b>	0.9233480176211454