Pattern Recognition

ECE 4363 / ECE 5363

Extra-Credit Project

1. Use Matlab's quadprog() function or Python's CVXOPT package to implement the kernel SVM and test its functionality with the data set generated as shown below. Use a Gaussian kernel with $\sigma = 1.75$. For $C = 10$ and $C = 100$, plot the samples, margin hyperplanes, and the decision boundary. Also, on the plot, identify and give the count of the support vectors and the misclassified samples.

```
rng(100);
class1=mvnrnd([1 3],[1 0; 0 1],60);
class2=mvnrnd([4 1],[2 0; 0 2],40);
```

For those programming in Python, the dataset is provided in the attached Excel file.

Archive your m-file or py-file together with a report containing the generated plots (2 in total) in a zip file named Lastname_ExtraCredit.zip and upload it to Blackboard prior to the deadline.