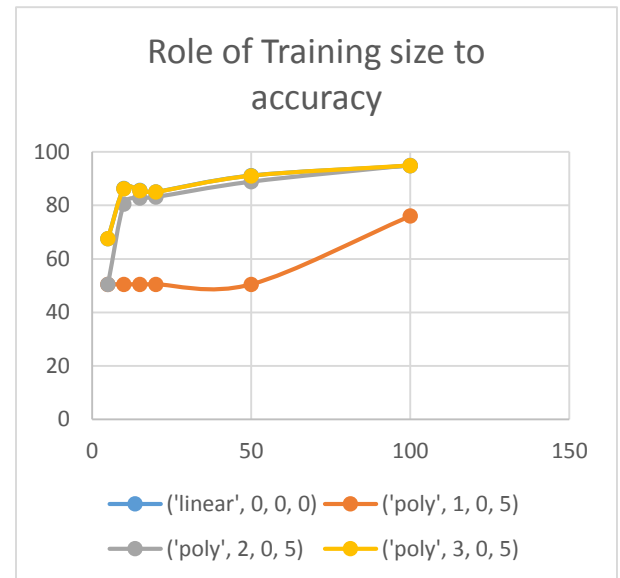
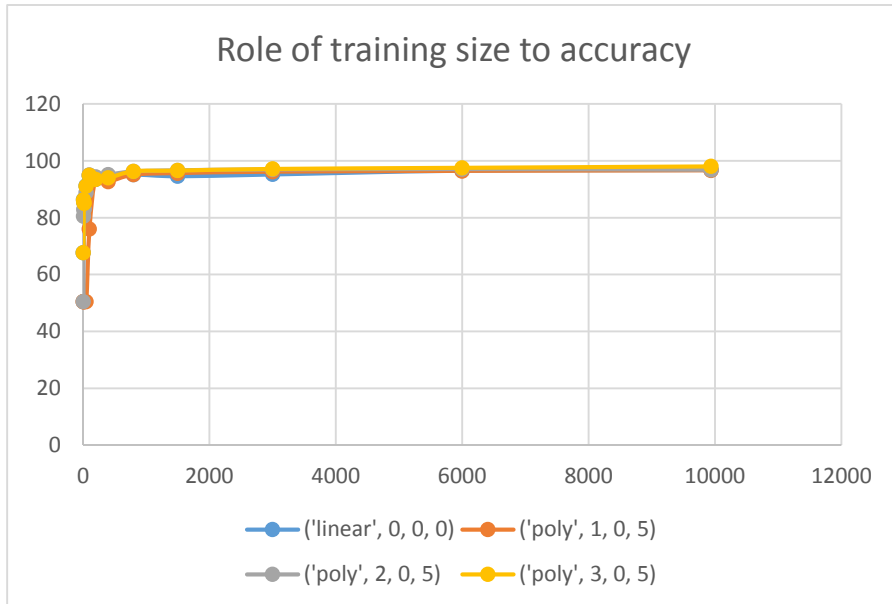
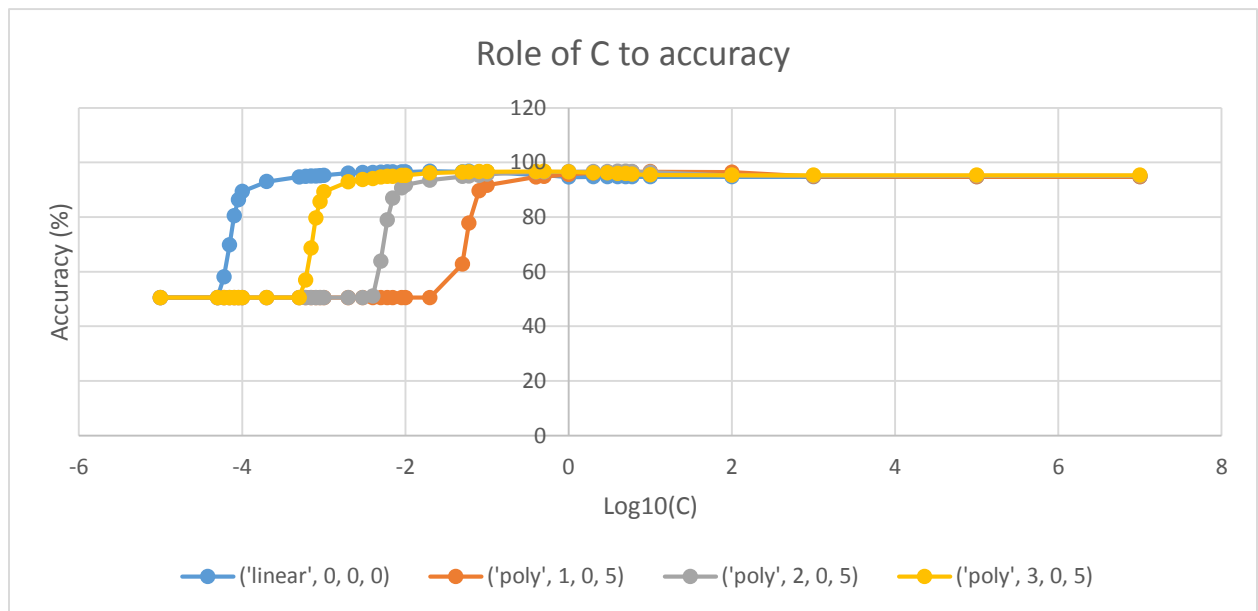


1. I used MNIST data and eliminate the examples that their labels isn't equal to 3 or 8. So in total there are 9943 training points and 2039 test points with label 3 or 8. By 100 training points we will give accuracy more than 90 percent for all kernels and by giving all training points we will give 96.8 % for leaner kernel and 98.03 percent accuracy for polynomial kernel with degree 3.



2. In general by increasing C the accuracy will be increased. Below you can see role of C to the accuracy. We calculate  $\text{Log}_{10}(C)$  and the x-axis is  $\text{Log}_{10}(C)$  and y-axis is accuracy. We also tried 4 kernels (one linear and 3 polynomial kernel)



$0.00001 < C < 10000000$

3. For finding support vectors we used this code:

```
plt.imshow(clf.support_vectors_[10*i].reshape((28, 28)), cmap = cm.Greys_r)  
plt.show()
```

