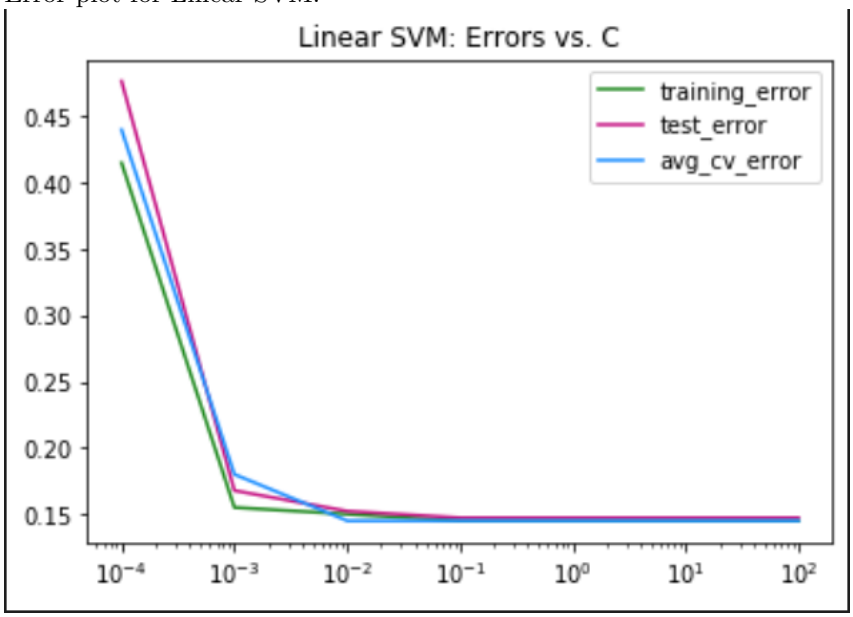
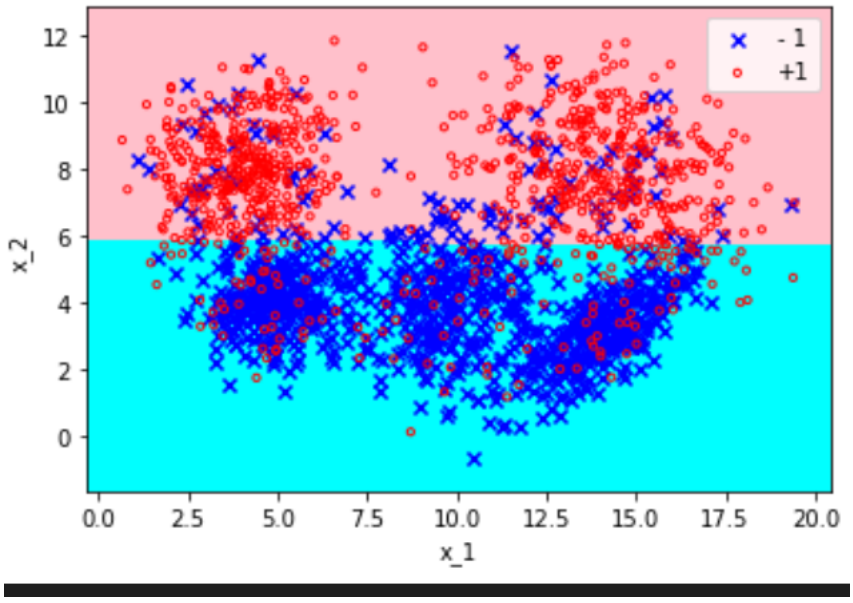
1. For linear SVM on synthetic data:

   Chosen C: 0.01
   Corresponding training error: 0.15
   Corresponding test error: 0.15222222222222223
   Error plot for Linear SVM:



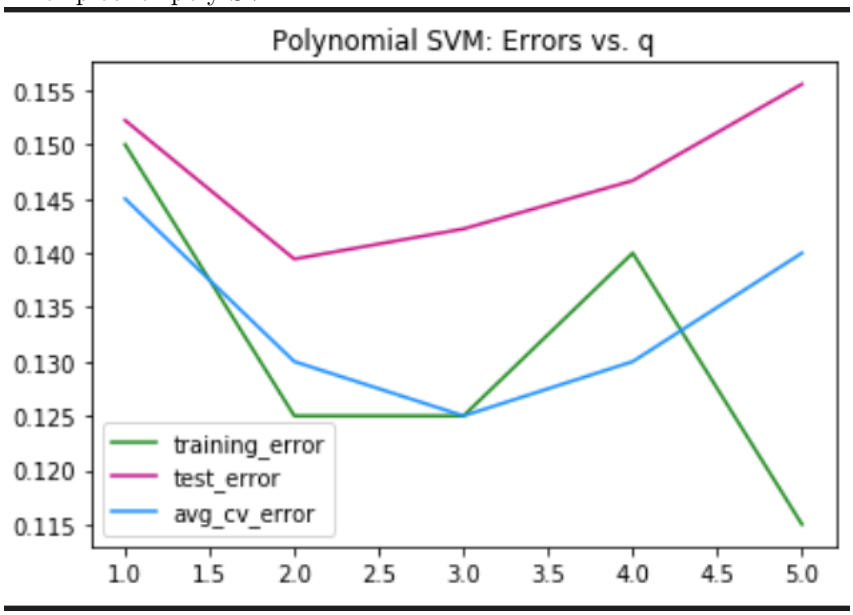
   Decision boundary plot for linear SVM:



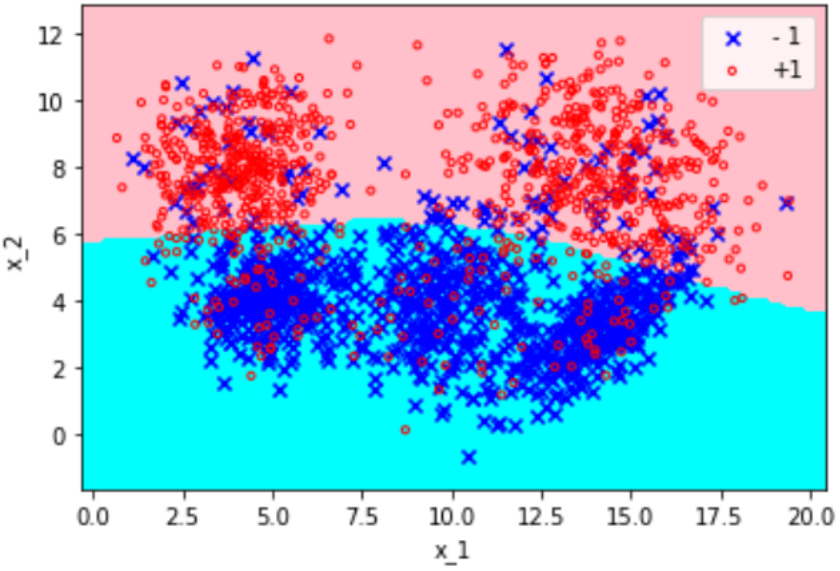
For poly SVM on synthetic data:

Chosen q: 3
Corresponding best C: 0.0001
Corresponding training error: 0.125
Corresponding test error: 0.14222222222222222

Error plot for poly SVM:



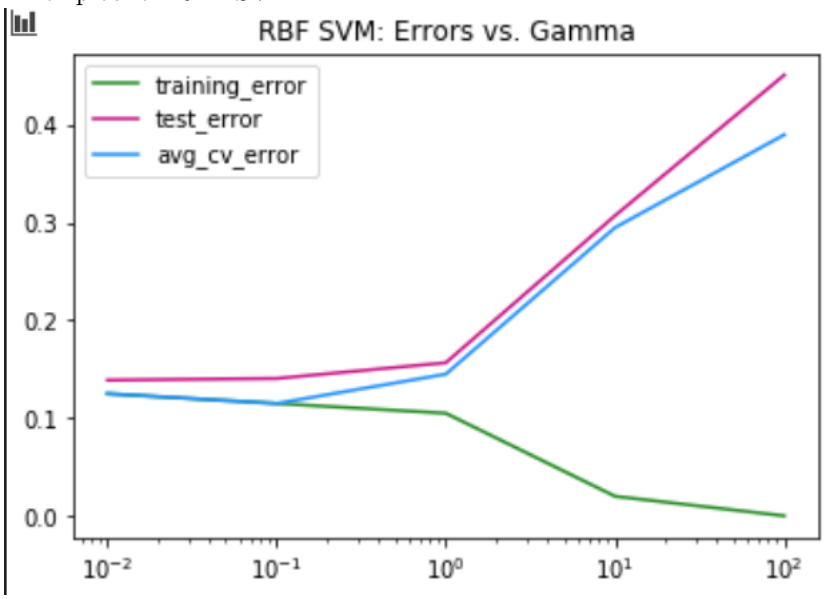
Decision boundary plot for poly SVM:



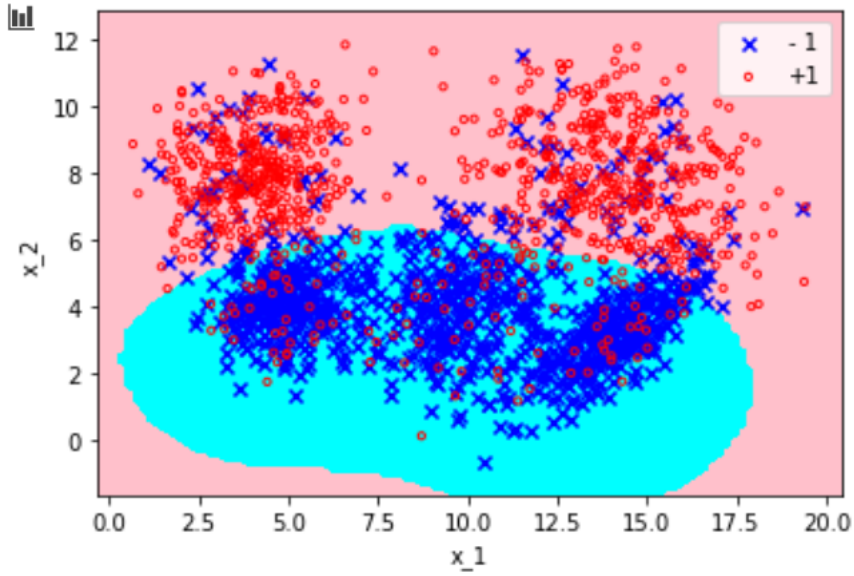
RBF SVM for synthetic data:

gamma chosen: 0.1
Corresponding best C: 0.1
Corresponding training error: 0.115
Corresponding test error: 0.14055555555555554

Error plot for RBF SVM:



Decision boundary plot for RBF SVM:

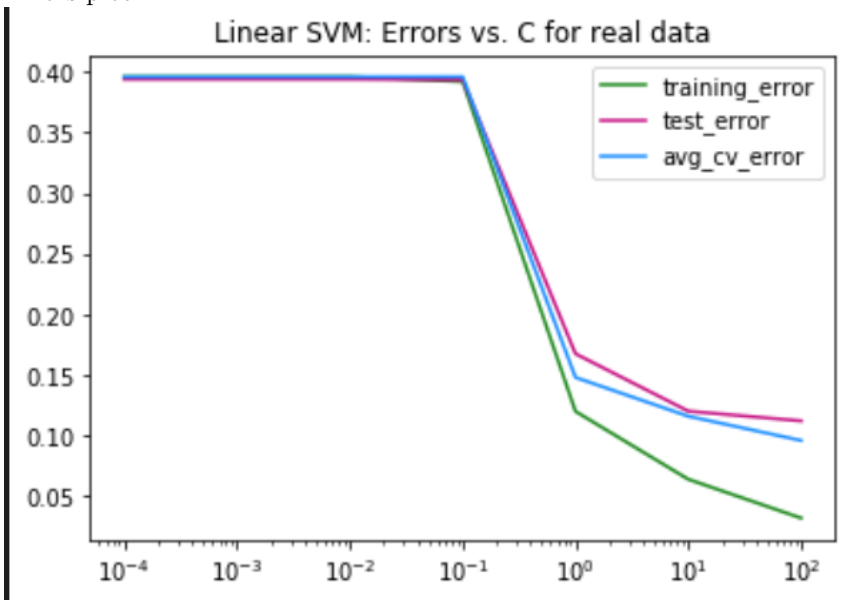


Summarize:

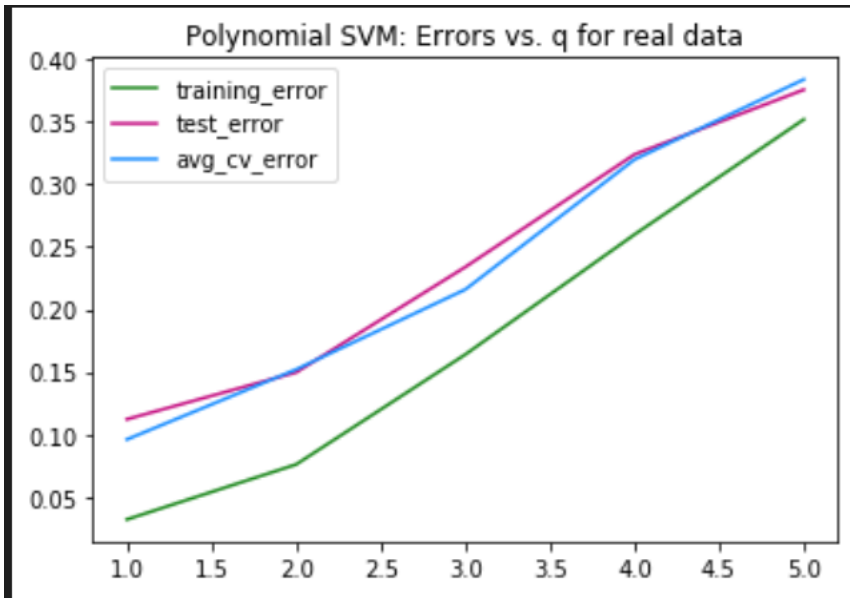
Algorithm	Parameters selected	Training Error	Test Error
Linear SVM	$C = 0.01$	0.15	0.15222222
Kernel SVM, Polynomial Kernel	$q = 3$; $C = 0.0001$	0.125	0.14222222
Kernel SVM, RBF Kernel	$\gamma = 0.1$; $C = 0.1$	0.115	0.14055555

2. Linear SVM for Real data:
   C chosen: 100
   Corresponding training error: 0.032
   Corresponding test error: 0.11215812456906459

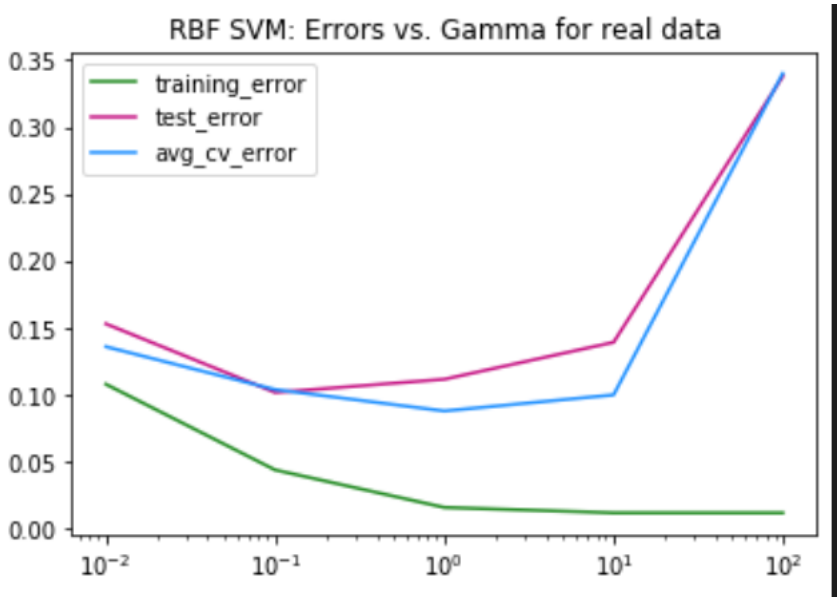
   Errors plot:



Poly SVM for Real data:
Chosen q: 1
Corresponding best C: 100
Corresponding training error: 0.032
Corresponding test error: 0.11215812456906459



RBF SVM for Real data:
Chosen gamma: 1
Corresponding best C: 100
Corresponding training error: 0.016
Corresponding test error: 0.1116984601241094



Summarize your results to the following table:

Algorithm	Parameters selected	Training Error	Test Error
Linear SVM	$C = 100$	0.032	0.112158124
Kernel SVM, Polynomial Kernel	$q = 1$; $C = 100$	0.32	0.112158124
Kernel SVM, RBF Kernel	$\gamma = 1$; $C = 100$	0.016	0.11169846