Output of nonlinear SVM classifier using polynomial kernel.

```
nishu@nishu-Inspiron-15-3567:~$ cd Desktop/
nishu@nishu-Inspiron-15-3567:~/Desktop$ cd q2/
nishu@nishu-Inspiron-15-3567:~/Desktop/q2$ clear

nishu@nishu-Inspiron-15-3567:~/Desktop/q2$ ./svm
bash: ./svm: No such file or directory
nishu@nishu-Inspiron-15-3567:~/Desktop/q2$ ./svm.py
/home/nishu/.local/lib/python2.7/site-packages/sklearn/cross_validation.py:44: DeprecationWarning: This module was deprecated in version 0.18 i
n favor of the model_selection module into which all the refactored classes and functions are moved. Also note that the interface of the new CV
 iterators are different from that of this module. This module will be removed in 0.20.
  "This module will be removed in 0.20.", DeprecationWarning)
C           degree          Accuracy Mean            Accuracy_Standard_Deviation
_____________________________________________________________________________
5           2             0.980833333333            0.0292973263854
5           3             0.980833333333            0.0292973263854
5           4             0.980833333333            0.0292973263854
50           2             0.9675           0.0441273409829
50           3             0.9675           0.0441273409829
50           4             0.9675           0.0441273409829
100           2             0.9675            0.0441273409829
100           3             0.9675            0.0441273409829
100           4             0.9675            0.0441273409829

Maximum Accuracy mean corresponding to C =5and d= 2is:0.980833333333
Maximum Accuracy mean corresponding to C =5and d= 2is:0.0292973263854
```

Output of nonlinear SVM classifier using rbf kernel.

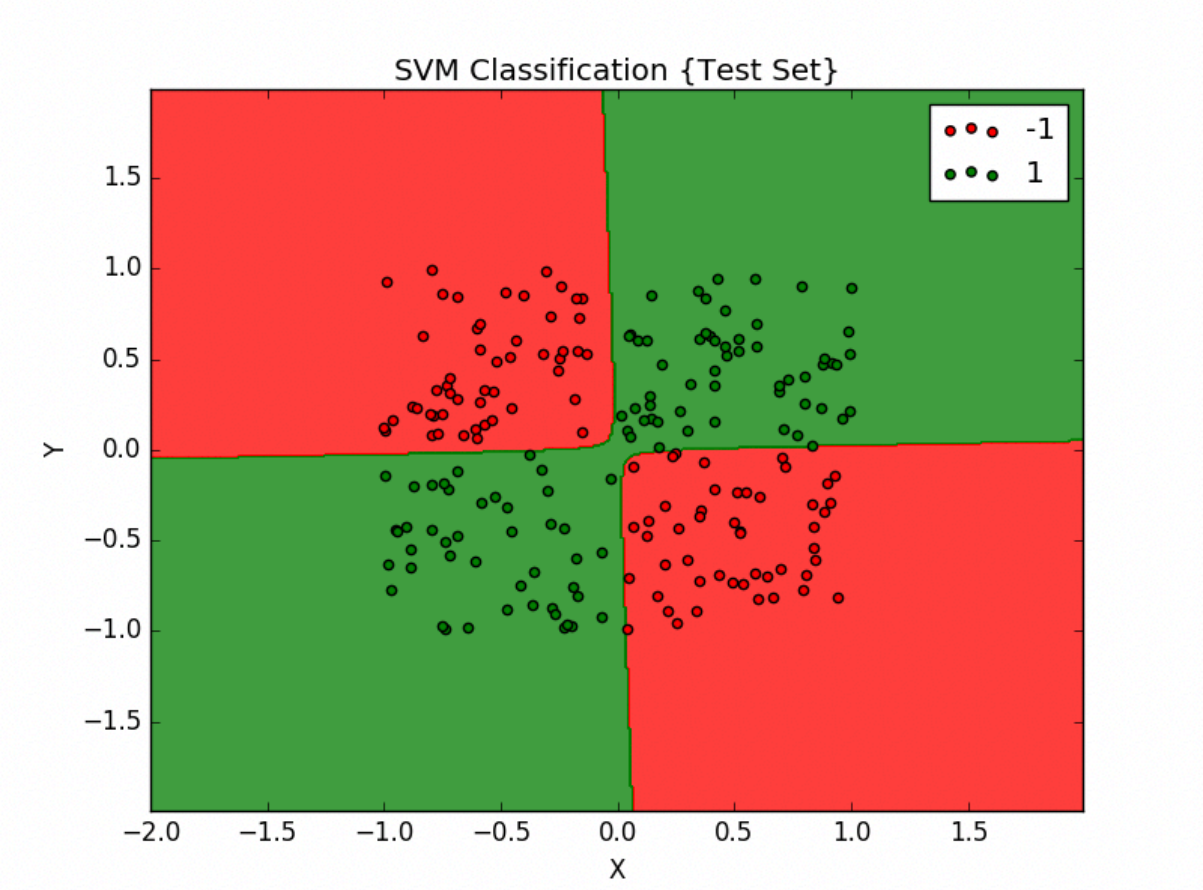
```
nishu@nishu-Inspiron-15-3567:~/Desktop/q2$ ./svmPoly.py
/home/nishu/.local/lib/python2.7/site-packages/sklearn/cross_validation.py:44: DeprecationWarning: This module was deprecated in version 0.18 i
n favor of the model_selection module into which all the refactored classes and functions are moved. Also note that the interface of the new CV
 iterators are different from that of this module. This module will be removed in 0.20.
  "This module will be removed in 0.20.", DeprecationWarning)
C           degree          Accuracy Mean            Accuracy_Standard_Deviation
_____________________________________________________________________________
5           2             0.967916666667            0.0425755048251
5           3             0.592328431373            0.0754940992434
100           2             0.967916666667            0.0425755048251
100           3             0.617745098039            0.0690253869016
20000           2             0.980416666667            0.0299333750928
20000           3             0.617745098039            0.0690253869016

Maximum Accuracy mean corresponding to C =20000and d= 2is:0.980416666667
Maximum Accuracy mean corresponding to C =20000and d= 2is:0.0299333750928
nishu@nishu-Inspiron-15-3567:~/Desktop/q2$
```

Part 1:
Plotted the data.

Part 2:

Trained nonlinear SVM classifier using polynomial kernel. Varied the values of C and d (degree of polynomial) in some range. For each combination of C and d, run 10-fold cross validation 30 times and report the average cross validation accuracy and standard deviation. Made a chart for that.
Find the best combination of C and d.

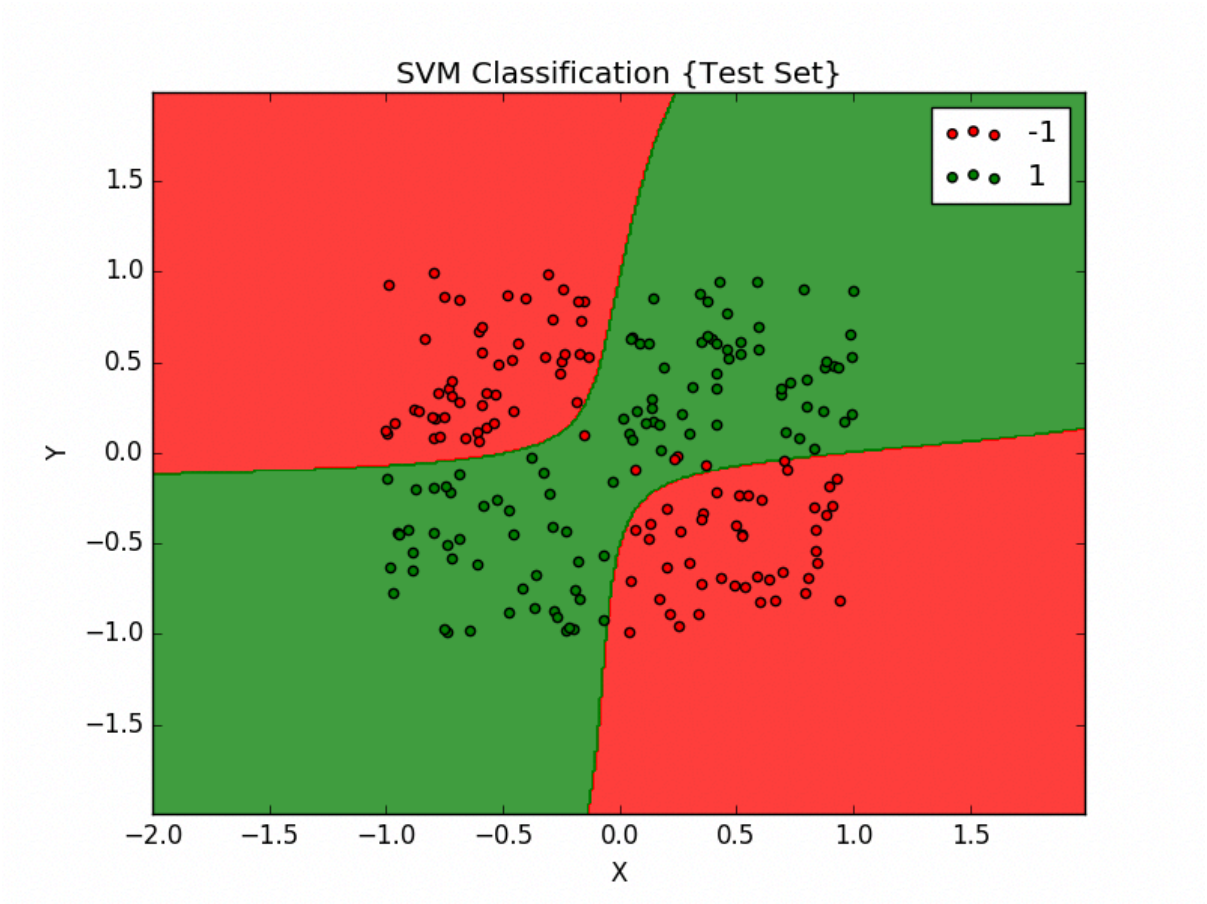
Used these parameters and train SVM using complete dataset. Plotted the final classifier.



Part 3:

Trained nonlinear SVM classifier using rbf (Gaussian) kernel. Varied the values of C and d (degree of polynomial) in some range. For each combination of C and d, run 10-fold cross validation 30 times and report the average cross validation accuracy and standard deviation. Made a chart for that.
Find the best combination of C and d.

Used these parameters and train SVM using complete dataset. Plotted the final classifier.



Part 4:

Compared the performances with different kernels and comment on the quality of classifiers in each case.

Polynomial Classifier is performing better than RBF.