1.

This question trains a one-vs-rest polynomial kernel perceptron on polynomials of degrees D such that $D \in \{1,2,3,4,5,6,7\}$ over 20 iterations. From the training and testing functions, the program derives the training and testing errors and standard deviations for each polynomial degree D.

```
Train Standard Deviations
0.0028100157448148395
0.002376631713456373
0.0019988908757994778
0.0022498917047259026
0.001983868744610059
0.0016783933339908563
0.0016029963496411606
```

```
Train Errors
0.15152594783543966
0.10606345791879539
0.09081742403872009
0.08409518687819306
0.08152729228287174
0.0794501210002689
0.07921484269965044
```

```
Test Standard Deviation
0.02659702741412829
0.010390784703391056
0.008583438990556934
0.006946259446015748
0.02664805704712137
0.006103038635577457
0.00465131449785794
```

```
Test Errors
0.10959677419354838
0.06631720430107527
0.05900537634408602
0.05169354838709676
0.056370967741935486
0.047419354838709675
0.04491935483870968
```