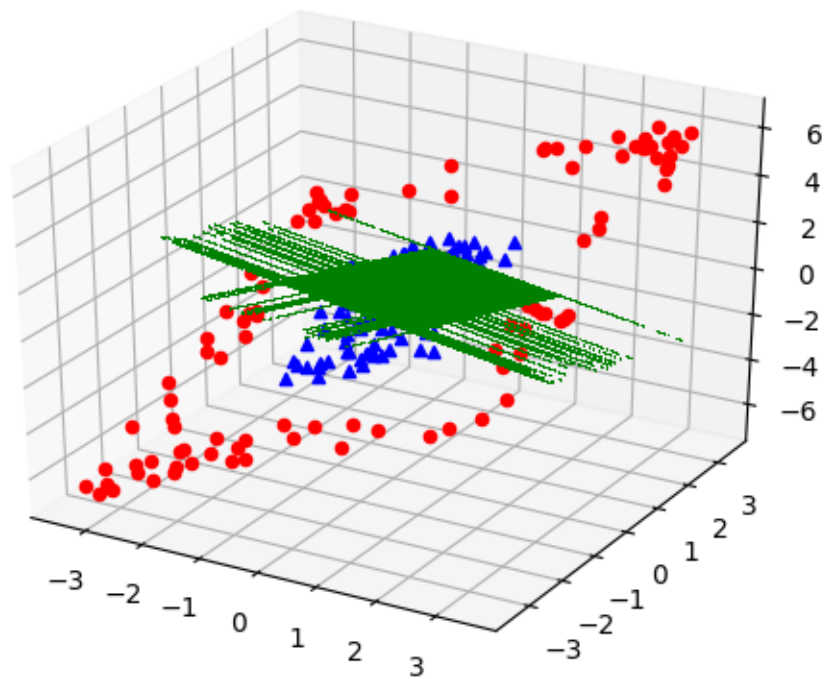
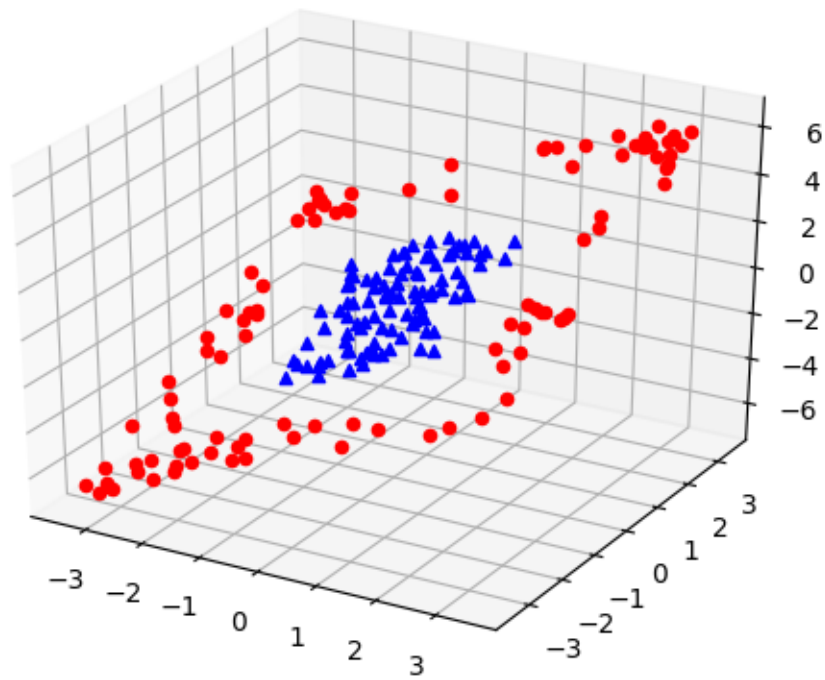


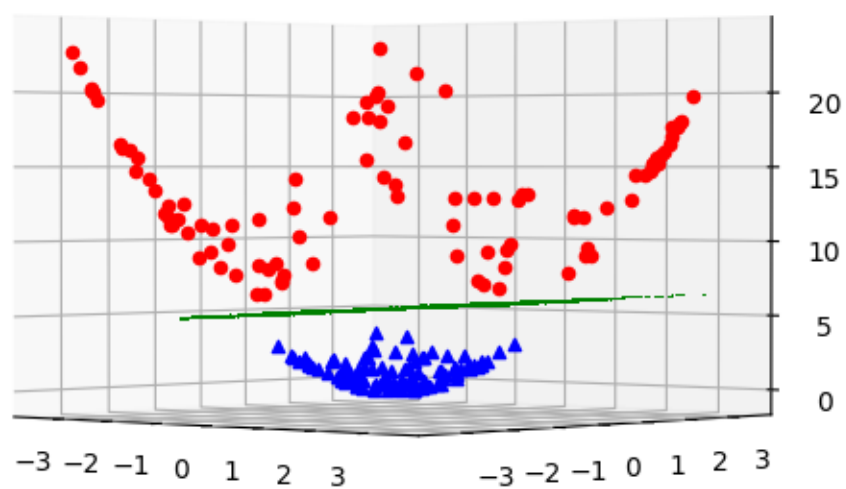
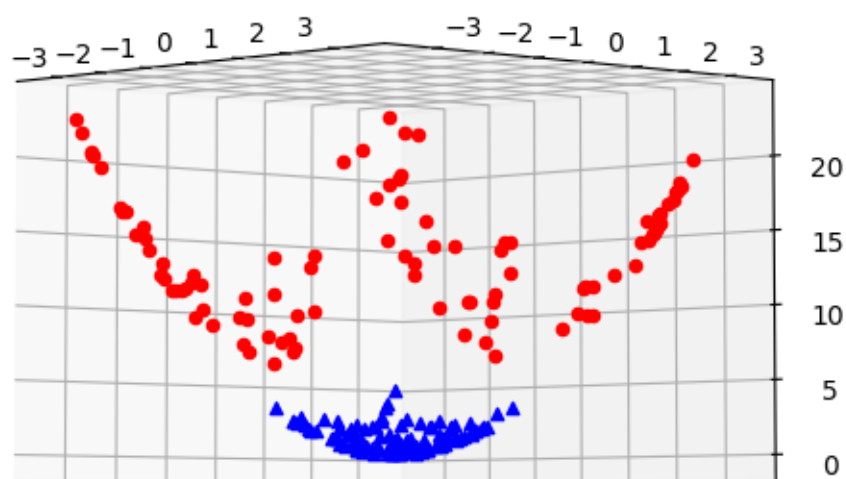
## Q1 Report

A)

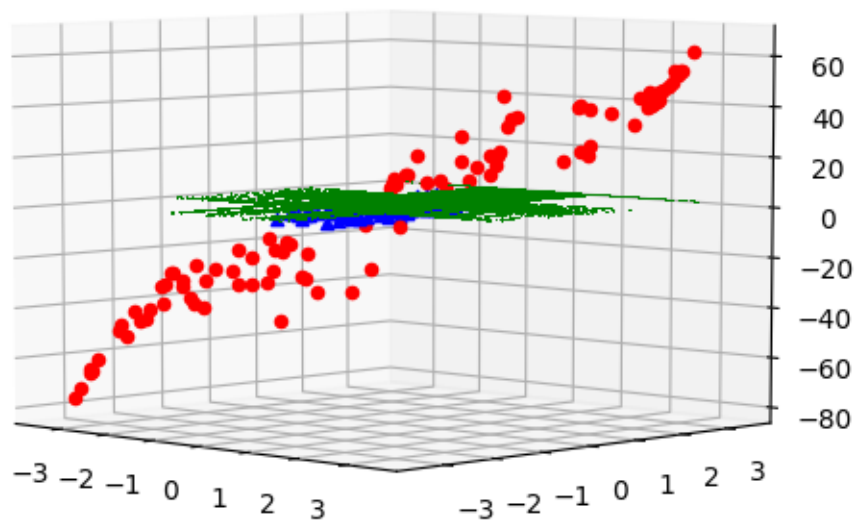
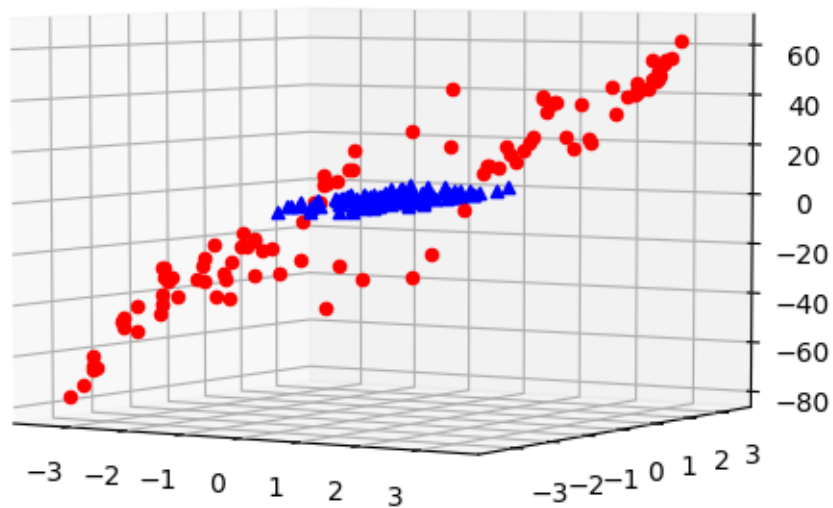
$z = x+y$  Training Accuracy: 0.5350



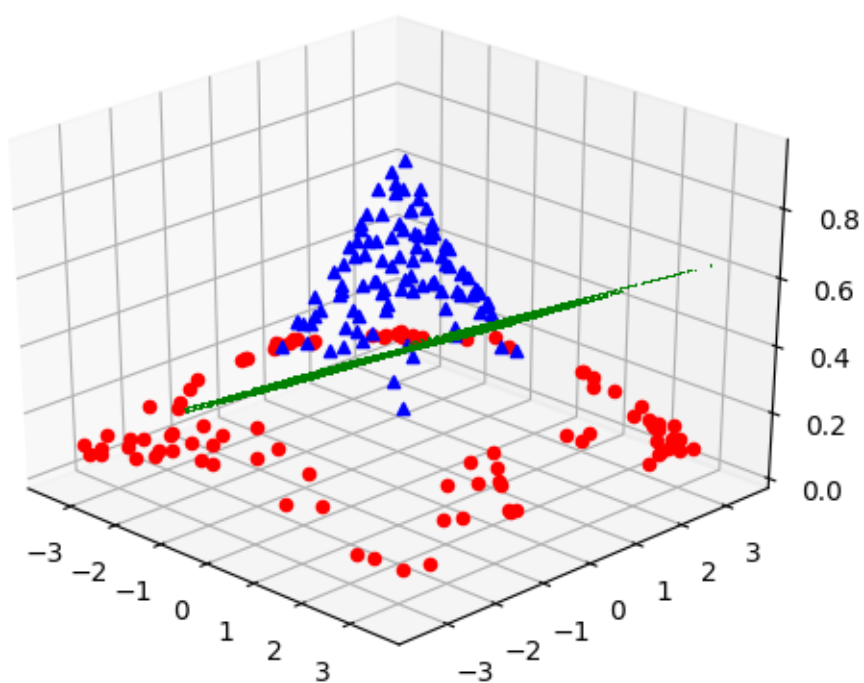
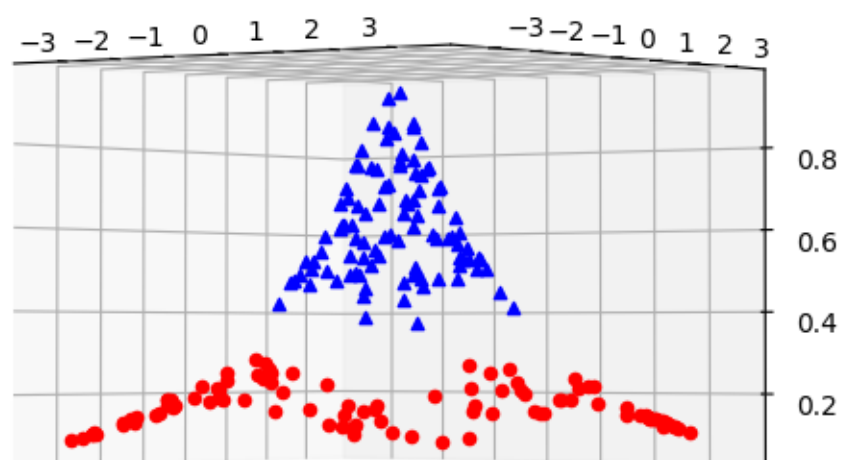
$z = x^2 + y^2$  Training Accuracy: 1.0000



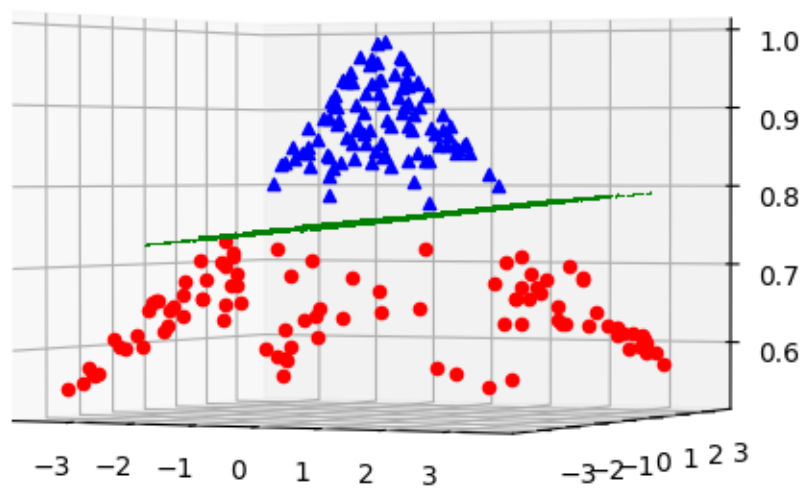
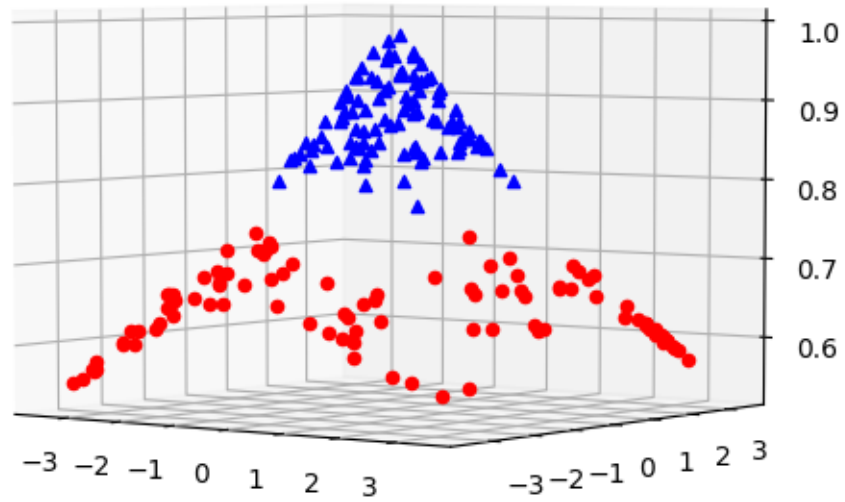
$z = x^3 + y^3$  Training Accuracy: 0.6600



$z = e^{-(x^2 + y^2) / 2 \cdot \sigma^2}$   
 $\sigma = 1$  Training Accuracy: 0.8400



$\sigma = 2$  Training Accuracy: 1.0000



We can form a paraboloid of the given data whose vertex is at the blue region, thus making the data linearly separable.

B)

1. 'linear'

C : 0.1000 Gamma : 0.1000

0.8335

C : 0.1000 Gamma : 1.0000

0.8277

C : 0.1000 Gamma : 10.0000

0.8433

C : 0.1000 Gamma : 100.0000

0.8464

C : 1.0000 Gamma : 0.1000

0.8517

C : 1.0000 Gamma : 1.0000

0.8576

C : 1.0000 Gamma : 10.0000

0.8503

C : 1.0000 Gamma : 100.0000

0.8568

C : 10.0000 Gamma : 0.1000

0.8543

C : 10.0000 Gamma : 1.0000

0.859

C : 10.0000 Gamma : 10.0000

0.8547

C : 10.0000 Gamma : 100.0000

0.854

C : 100.0000 Gamma : 0.1000

0.8453

C : 100.0000 Gamma : 1.0000

0.8547

C : 100.0000 Gamma : 10.0000

0.8594

C : 100.0000 Gamma : 100.0000

0.8524

2.

'poly'

C : 0.1000 Gamma : 0.1000

0.8254

C : 0.1000 Gamma : 1.0000

0.9433

C : 0.1000 Gamma : 10.0000

0.9452

C : 0.1000 Gamma : 100.0000

0.943

C : 1.0000 Gamma : 0.1000  
0.9312  
C : 1.0000 Gamma : 1.0000  
0.9432  
C : 1.0000 Gamma : 10.0000  
0.9443  
C : 1.0000 Gamma : 100.0000  
0.9427  
C : 10.0000 Gamma : 0.1000  
0.9555  
C : 10.0000 Gamma : 1.0000  
0.9433  
C : 10.0000 Gamma : 10.0000  
0.9412  
C : 10.0000 Gamma : 100.0000  
0.945  
C : 100.0000 Gamma : 0.1000  
0.9483  
C : 100.0000 Gamma : 1.0000  
0.946  
C : 100.0000 Gamma : 10.0000  
0.9452  
C : 100.0000 Gamma : 100.0000  
0.9471

3.

'rbf'

C : 0.1000 Gamma : 0.1000  
0.8594  
C : 0.1000 Gamma : 1.0000  
0.6502  
C : 0.1000 Gamma : 10.0000  
0.0432  
C : 0.1000 Gamma : 100.0000  
0.0418  
C : 1.0000 Gamma : 0.1000  
0.9546  
C : 1.0000 Gamma : 1.0000  
0.9352  
C : 1.0000 Gamma : 10.0000  
0.2586  
C : 1.0000 Gamma : 100.0000  
0.1259  
C : 10.0000 Gamma : 0.1000  
0.973  
C : 10.0000 Gamma : 1.0000  
0.9432  
C : 10.0000 Gamma : 10.0000  
0.3029

C : 10.0000 Gamma : 100.0000  
0.1333  
C : 100.0000 Gamma : 0.1000  
0.9739  
C : 100.0000 Gamma : 1.0000  
0.9396  
C : 100.0000 Gamma : 10.0000  
0.2987  
C : 100.0000 Gamma : 100.0000  
0.1298

Best result with rbf kernel, gamma=0.1, C=100  
Accuracy : 97.3%

Experiments on all possible pairs (120) of attributes to find which pair has the maximum value of accuracy.

From these I found that the feature pair (12, 13) are the most discriminative features.