

## Task 2.1

Output:

Number of nearest neighbours: 1

Number of test samples: 3974

User time taken in seconds: 24.49

Accuracy: 0.9643

Number of wrongly classified test samples: 142

Number of nearest neighbours: 3

Number of test samples: 3974

User time taken in seconds: 27.28

Accuracy: 0.9663

Number of wrongly classified test samples: 134

Number of nearest neighbours: 5

Number of test samples: 3974

User time taken in seconds: 25.94

Accuracy: 0.9645

Number of wrongly classified test samples: 141

Number of nearest neighbours: 10

Number of test samples: 3974

User time taken in seconds: 28.27

Accuracy: 0.9575

Number of wrongly classified test samples: 169

Number of nearest neighbours: 20

Number of test samples: 3974

User time taken in seconds: 24.45

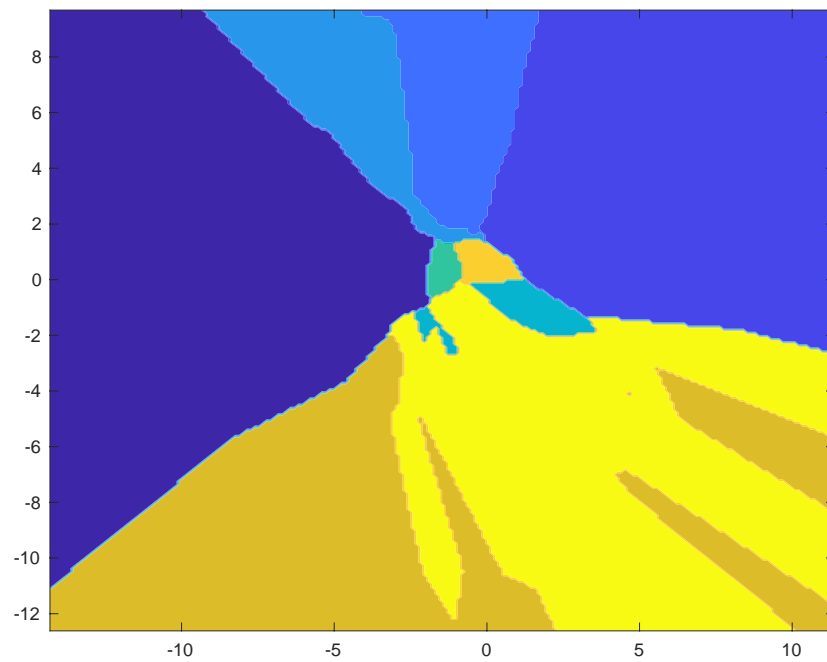
Accuracy: 0.9512

Number of wrongly classified test samples: 194

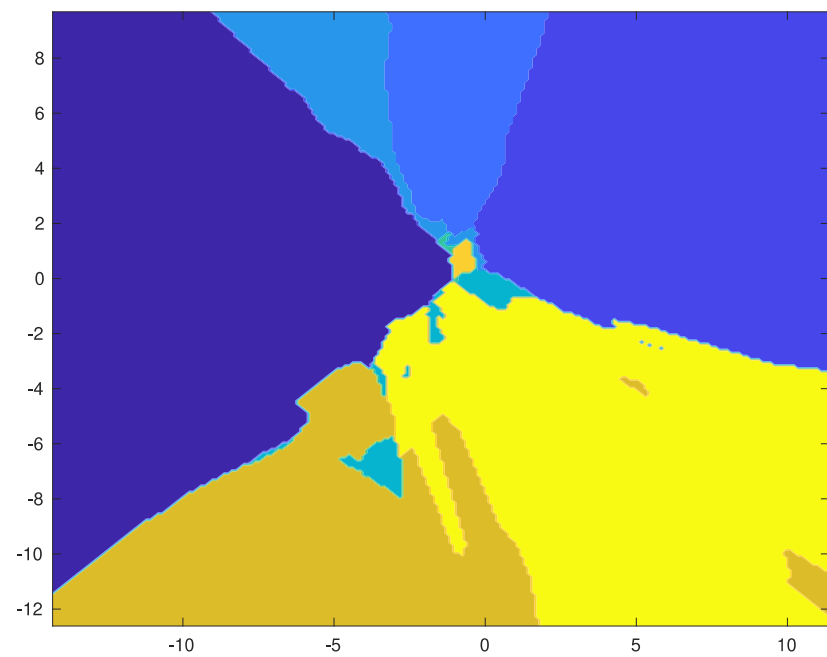
## Task 2.2

Due to high memory usage the sample size was reduced to the first  $N=10000$  samples. The following decision regions were generated:

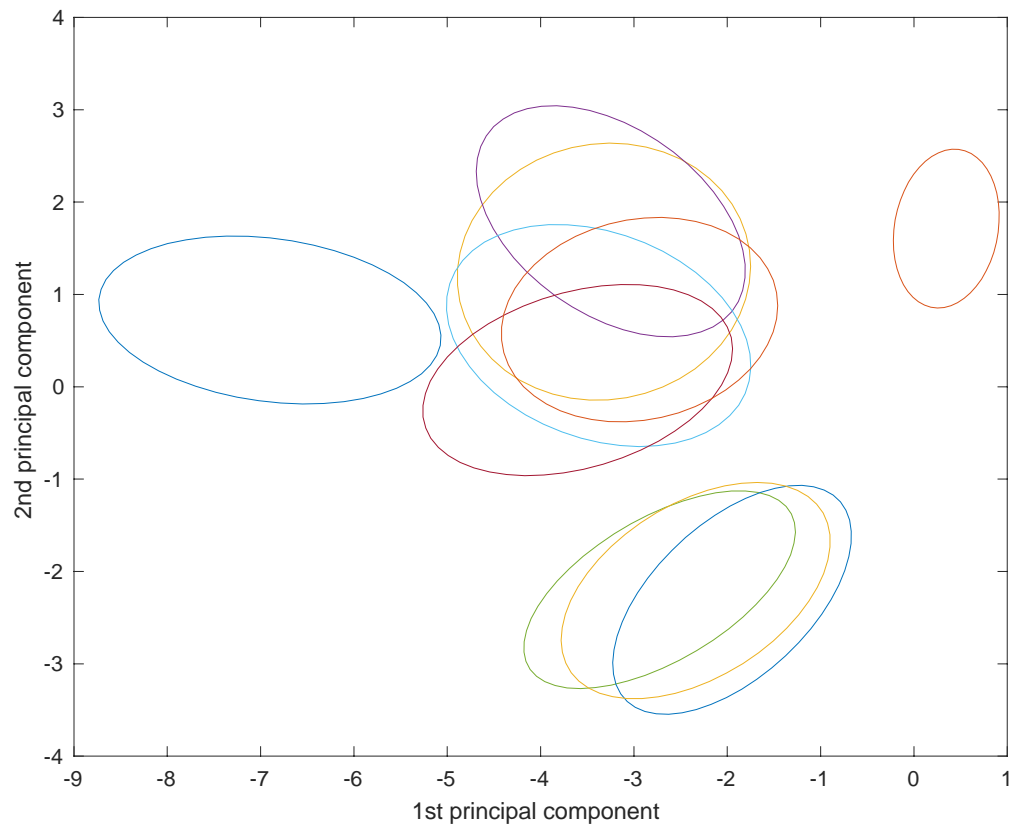
For  $k=1$



and for  $k=3$



### Task 2.3



## Task 2.4

Class	Correlation
1	-0.2106
2	0.1539
3	0.0449
4	-0.4299
5	0.5887
6	-0.2715
7	0.3224
8	0.5605
9	0.1378
10	0.4548
All	0

## Task 2.5

Output:

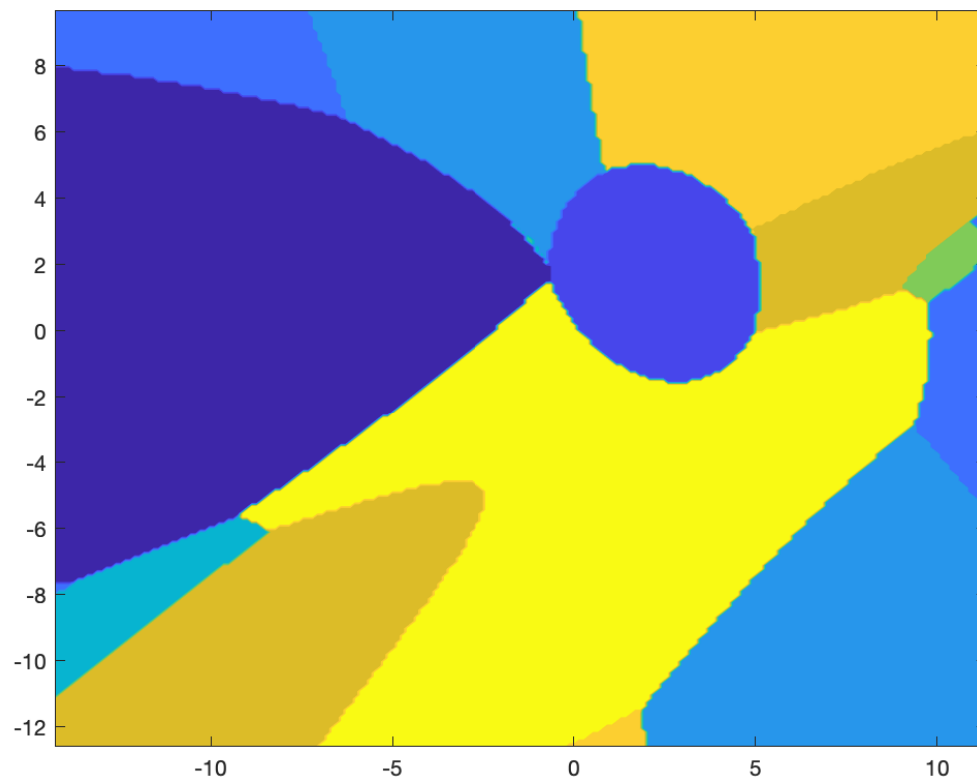
Number of test samples: 3974

User time taken in seconds: 65.08

Accuracy: 0.9421

Number of wrongly classified test samples: 230

### Task 2.6



### Task 2.7

Ratio	Accuracy
90%	0.9429
80%	0.9431
70%	0.9424
60%	0.9429
50%	0.9436
40%	0.9444
30%	0.9434

## Task 2.8

Output:

```
>> task2_8(Xtrn, Ytrn, Xtst, Ytst, 0.01, 2);  
Number of test samples: 3974  
User time taken in seconds: 28.92  
Accuracy: 0.8571  
Number of wrongly classified test samples: 568
```

```
>> task2_8(Xtrn, Ytrn, Xtst, Ytst, 0.01, 5);  
Number of test samples: 3974  
User time taken in seconds: 72.90  
Accuracy: 0.8953  
Number of wrongly classified test samples: 416
```

```
>> task2_8(Xtrn, Ytrn, Xtst, Ytst, 0.01, 10);  
Number of test samples: 3974  
User time taken in seconds: 140.21  
Accuracy: 0.9157  
Number of wrongly classified test samples: 335
```