Question 1)

Training errors for the features: {2: 54, 3: 86, 4: 76, 5: 64, 9: 62, 10: 59, 11: 73, 12: 59, 13: 19, 17: 55, 18: 89, 19: 84, 20: 43, 25: 99, 26: 80, 27: 77, 28: 31, 29: 4, 30: 34, 33: 43, 34: 18, 35: 51, 36: 59, 37: 73, 38: 70, 41: 44, 42: 1, 43: 24, 44: 89, 45: 92, 46: 53, 47: 92, 49: 98, 50: 44, 51: 40, 52: 78, 53: 101, 54: 35, 55: 69, 57: 93, 58: 62, 59: 70, 60: 78, 61: 49, 62: 50, 63: 88}

Test errors for the features: {2: 77, 3: 162, 4: 157, 5: 106, 9: 93, 10: 81, 11: 84, 12: 128, 13: 30, 17: 108, 18: 1 84, 19: 131, 20: 59, 25: 194, 26: 129, 27: 120, 28: 57, 29: 29, 30: 72, 33: 69, 34: 27, 35: 74, 36: 87, 37: 166, 38: 125, 41: 72, 42: 3, 43: 36, 44: 136, 45: 184, 46: 129, 47: 164, 49: 163, 50: 105, 51: 60, 52: 166, 53: 169, 54: 96, 55: 161, 57: 166, 58: 77, 59: 144, 60: 139, 61: 107, 62: 133, 63: 178}

Best 10 features of the dataset are: [(42, 3), (34, 27), (29, 29), (13, 30), (43, 36), (28, 57), (20, 59), (51, 60), (3 3, 69), (30, 72)]

42 feature is the best feature with 3 error

Question 2)

Confusion matrix:

```
tp,tn,fp,fn:   100 100 0 0
tp,tn,fp,fn:   179 178 2 2

Training Error for the train data: 0.0
Testing Error for the test data: 0.011080332409972304
```

Question 3)

Confusion matrix:

```
tp,tn,fp,fn:   100 100 0 0
tp,tn,fp,fn:   180 180 0 1

Training Error for the training data: 0.0
Testing Error for the test data: 0.0027700831024930483
```

Question 4)

```
tp,tn,fp,fn:   179 173 7 2
Test Error with the best features: 0.024930747922437657
```

The test error for question-4 is greater compared to the one in question-2 as we just use only 10 features here ignoring the rest