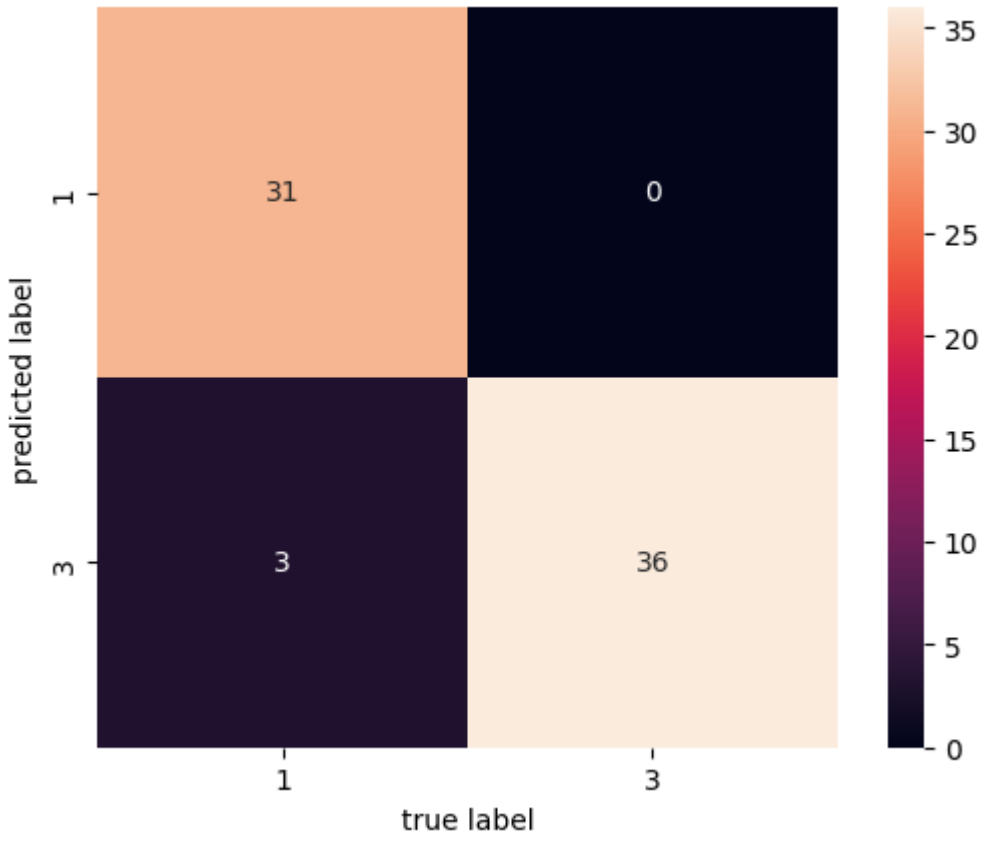
Group 3. R = 2: class L = 1 (negative) and L = 3 (positive)

ID - U43517028 8//3 = 2

Question 1

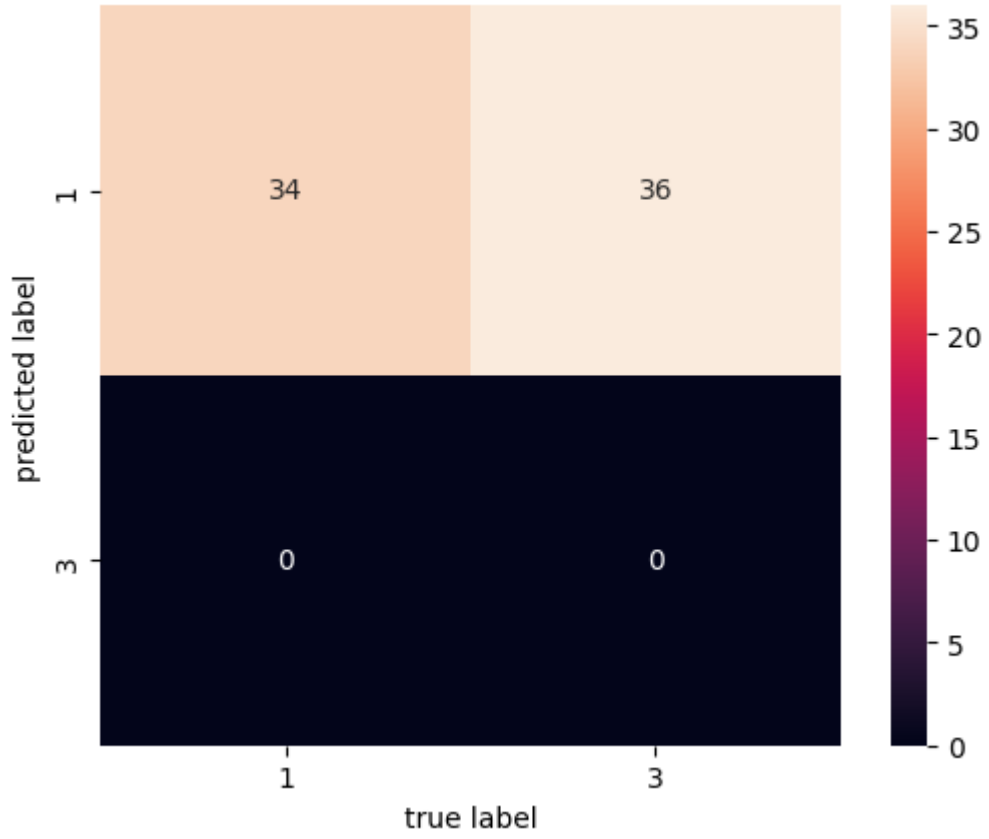
Q1 1.

Accuracy - 0.9571428571428572



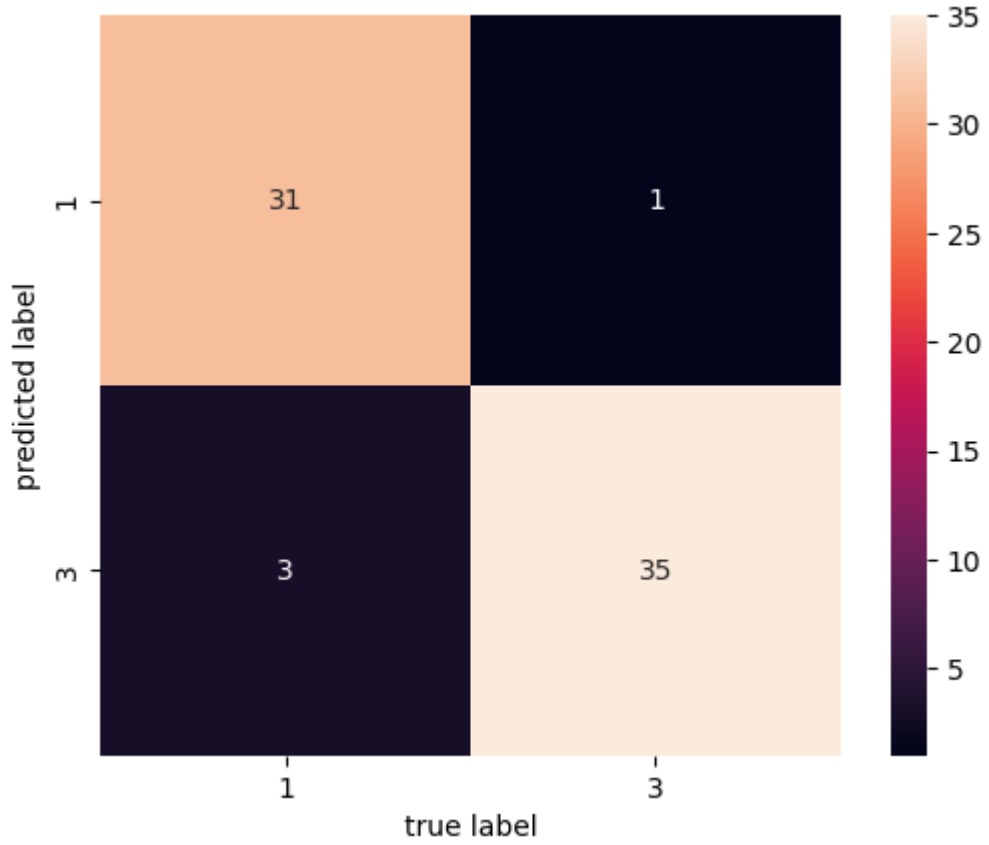
Q1 2.

Accuracy - 0.4857142857142857



Q1 3.

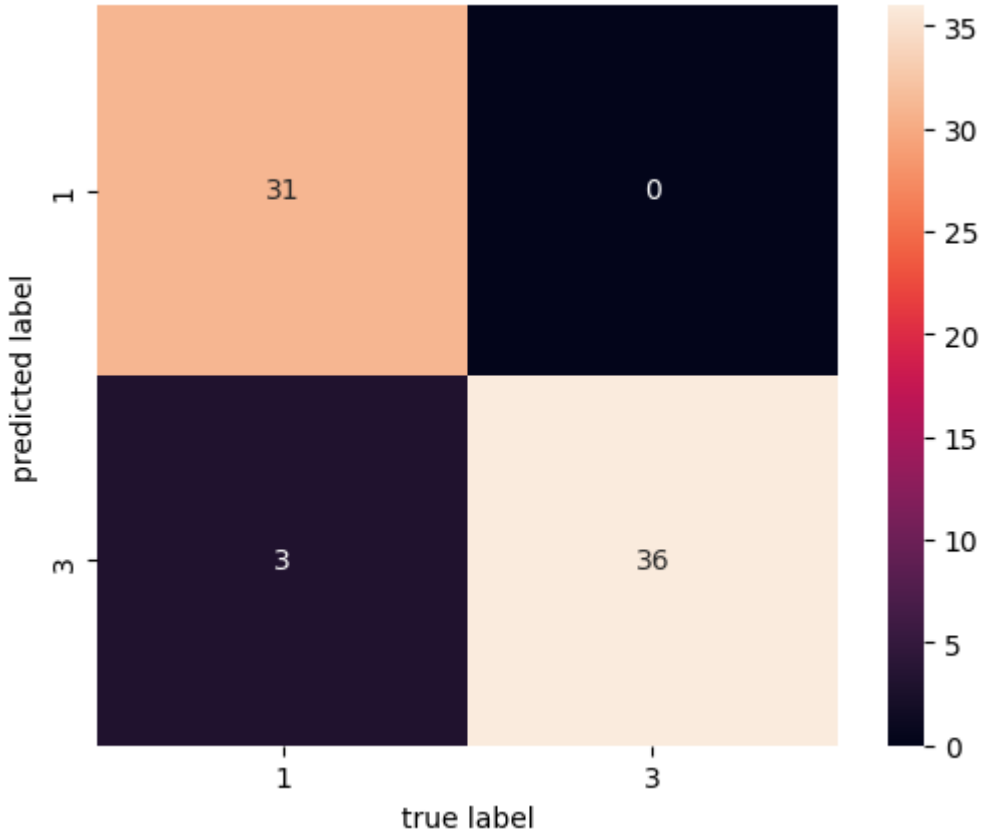
Accuracy - 0.9428571428571428



Question 2 My Classifier - Logistic Regression

Q2 1.

Accuracy - 0.9571428571428572



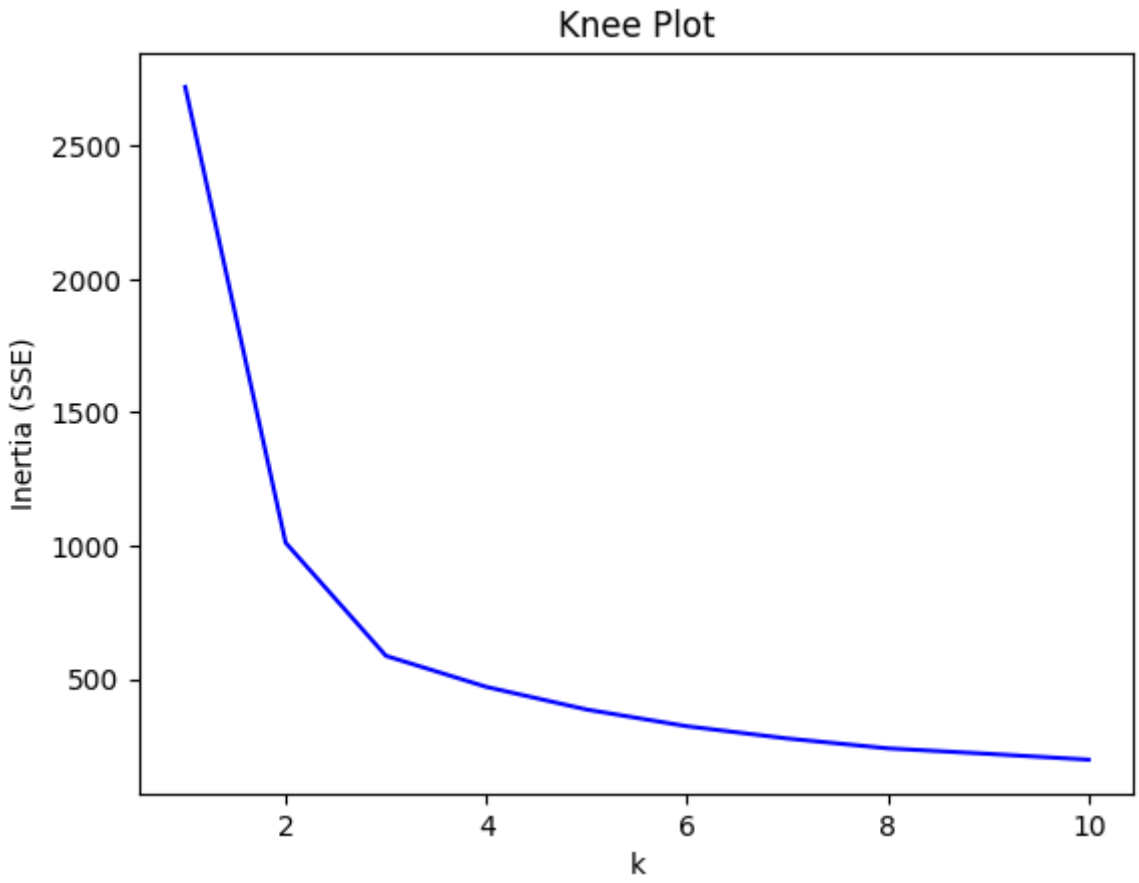
Q2 2.

```
Model   TP  FP  TN  FN  accuracy    TPR TNR
linear SVM  36  3   31  0   0.957143    1.000000    0.911765
Gaussian SVM    0   0   34  36  0.485714    0.000000    1.000000
polynomial SVM  35  3   31  1   0.942857    0.972222    0.911765
Logistic Regression 36  3   31  0   0.957143    1.000000    0.911765
```

Logistic Regression has the same stats as Linear SVM and both have the highest accuracy. While the other SVM methods have lower accuracy especially guassian SVM.

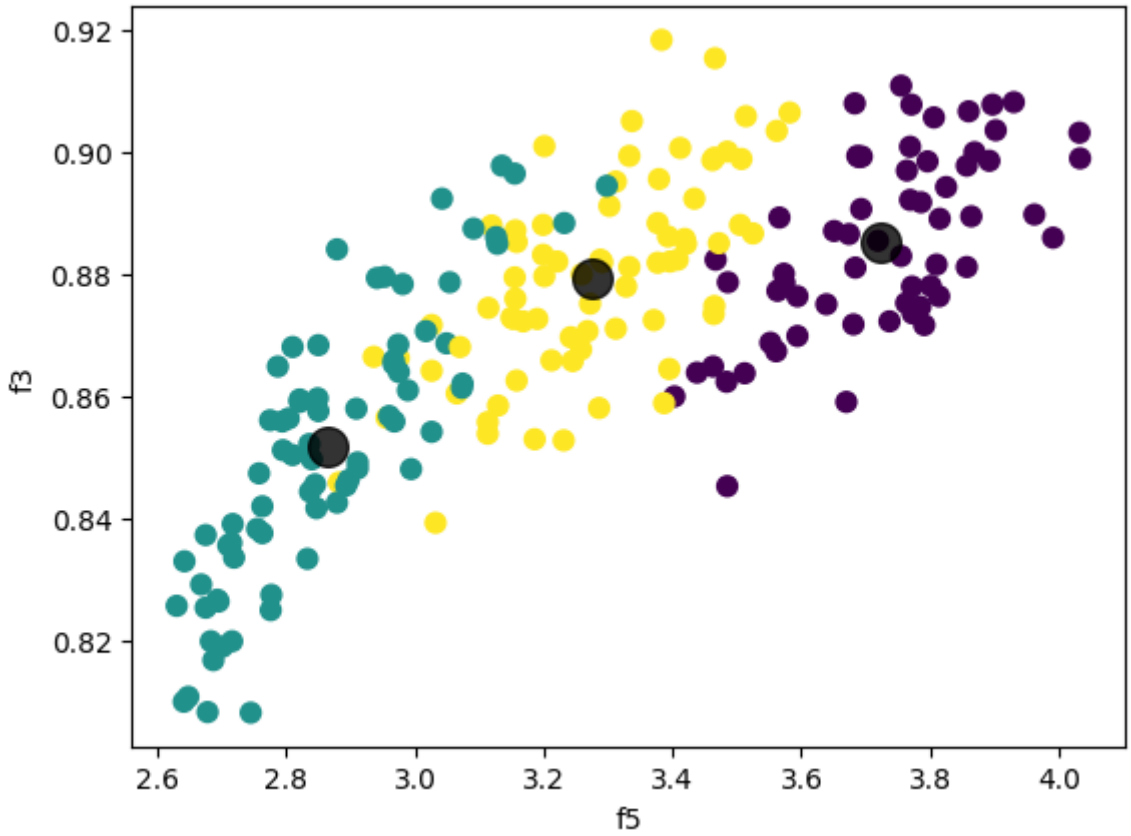
Question 3

Q3 1.


Knee Plot
Inertia (SSE)
2500
2000
1500
1000
500
2
4
6
8
10
k

Best k = 3

Q3 2.


f3
0.92
0.90
0.88
0.86
0.84
0.82
2.6
2.8
3.0
3.2
3.4
3.6
3.8
4.0
f5

There are few points which are closer to other centroids but they still belong to their own centroid. Because the grph is of 2 dimensions concerning only two features while the kMeans cluster are calculated for 7 features, which is 7 dimensions. Hence you can see such irregularity because of lower dimension visualization.

Q3 3.

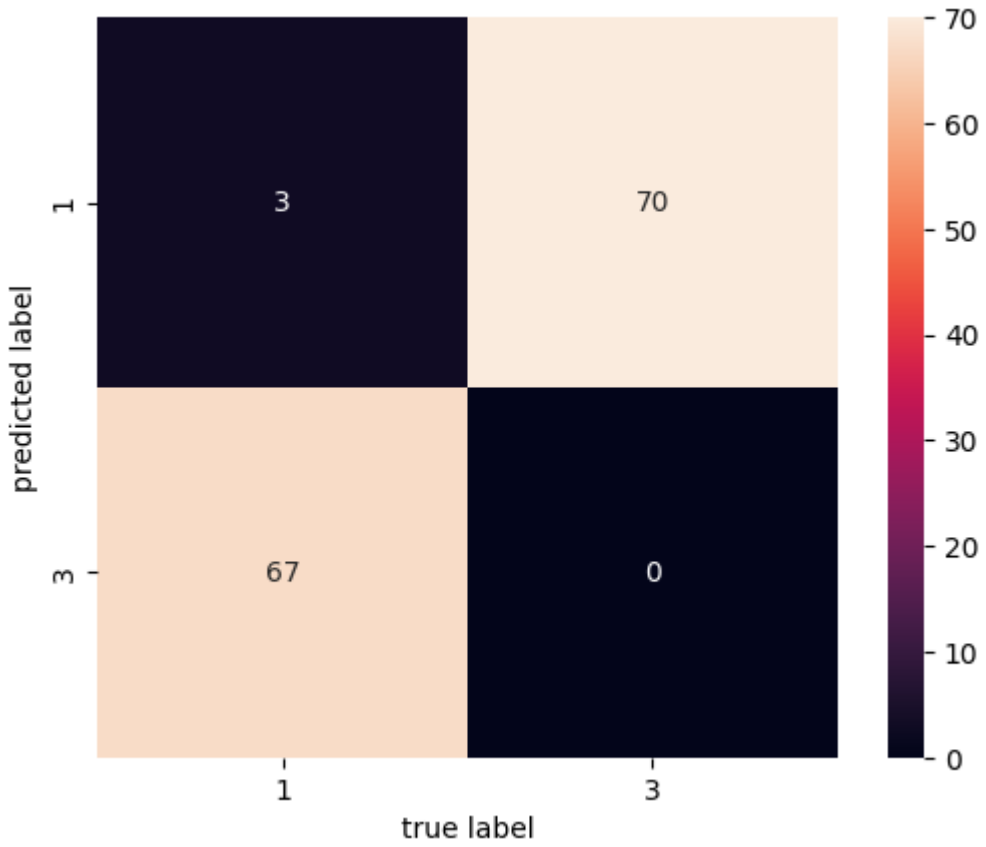
0th cluster = Label 2
1st cluster = Label 3
2nd cluster = Label 1

0th cluster Centroid = [18.72180328, 16.29737705, 0.88508689, 6.20893443, 3.72267213,3.60359016, 6.06609836, 1.98360656]
1st cluster Centroid = [11.90906667, 13.25026667, 0.85154933, 5.22233333, 2.86509333, 4.72218667, 5.09304 , 2.86666667]
2nd cluster Centroid = [14.63202703, 14.45324324, 0.8790973 , 5.56178378, 3.27489189, 2.74404324, 5.18493243, 1.13513514]

Q3 4.

Accuracy - 0.3476190476190476

Q3 5.



Model	TP	FP	TN	FN	accuracy	TPR	TNR
linear SVM	36	3	31	0	0.957143	1.000000	0.911765
Gaussian SVM	0	0	34	36	0.485714	0.000000	1.000000
polynomial SVM	35	3	31	1	0.942857	0.972222	0.911765

```
Logistic Regression 36  3   31  0   0.957143    1.000000    0.911765
K Means 0   67  3   70  0.021429    0.000000    0.042857
```

The K means seems to have the worst accuracy of all. This gives a perspective of the data which indicates the data is not expected to be clustered.