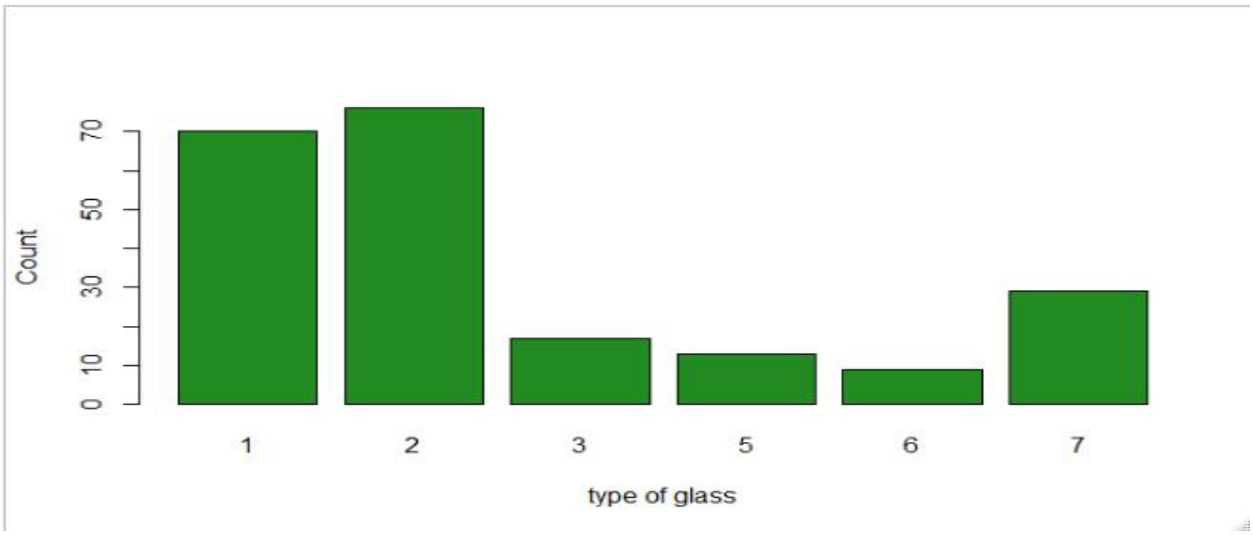
KNN

Example- Model for Glass classification

Proportion of glass



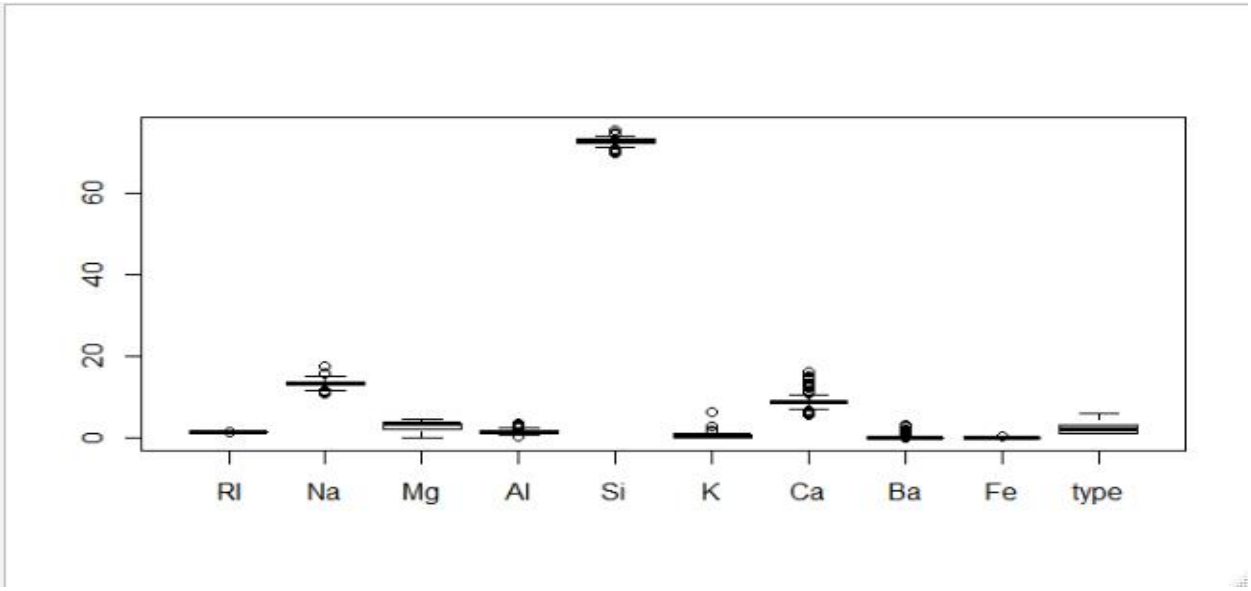

```
    1     2     3     5     6     7
32.71 35.51  7.94  6.07  4.21 13.55
```

Summary of glass data

	RI	Na	Mg	Al	Si	K	Ca	Ba	Fe
Min	1.511	10.73	0	0.290	69.81	0.0000	5.430	0.000	0.00000
1st Qu	1.517	12.91	2.115	1.190	72.28	0.1225	8.240	0.000	0.00000
Median	1.518	13.3	3.480	1.360	71.79	0.5550	8.600	0.000	0.00000
Mean	1.518	13.41	2.685	1.445	72.65	0.4971	8.957	0.175	0.05701
3rd Qu	1.519	13.82	3.600	1.630	73.09	0.6100	9.172	0.000	0.10000
Max	1.534	17.38	4.490	3.500	75.41	6.2100	16.190	3.150	0.51000

Mean and Median is approximately same for every variable so chances are very rare to get outlier from data.

Box Plot for all variable



Model Prediction

Model 1 ➔ Using caret and K = 5

```
pred_1
     1  2  5  6  7
  1 13  7  0  0  0
  2  5 13  1  0  0
  3  3  0  0  0  0
  5  0  0  1  0  0
  6  0  1  0  1  0
  7  1  1  0  1  9
```

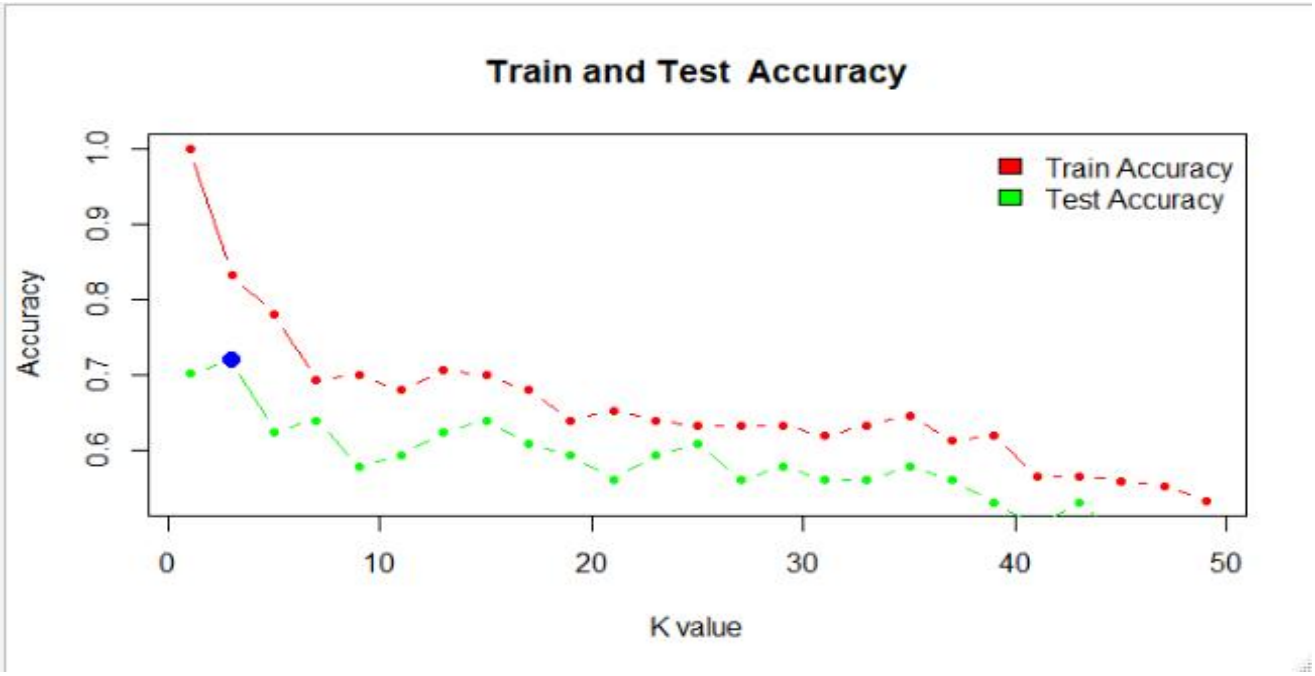
Accuracy ➔ 0.6491228

Model 2 ➔ Using class and K = 5

```
   1  2  3  5  6  7
  1 14  7  0  0  0  0
  2  5 14  0  1  1  0
  3  3  1  1  0  0  0
  5  0  2  0  1  0  0
  6  0  1  0  0  1  0
  7  1  1  0  0  1  9
```

Accuracy ➔ 0.625

Model ➔ K= All odds from 1 to 50



From the above plot it is shown that train accuracy is high for value k= 1 and test accuracy is high for k=3

Final Model ➔ K= 3

```
model_final
      1  2  3  5  6  7
  1 16  5  0  0  0  0
  2  5 15  0  1  0  0
  3  3  1  1  0  0  0
  5  0  0  0  3  0  0
  6  0  0  0  0  2  0
  7  1  1  0  0  1  9
```

Accuracy ➔ 0.71875

From the above predictions this is best model with accuracy nearly 72 % for classification.