**Dataset Details:** Here we are given thousands of image which have 28\*28 pixels each.

000 001 002 003 ... 026 027 028 029 030 031 ... 054 055 056 057 058 059 ... 082 083 | | | | ... | | 728 729 730 731 ... 754 755 756 757 758 759 ... 782 783

* Data Split

Here the test.csv file has been divide into 8:2 ratio for training and testing our classifier. And, then 10% of the dataset is used for cross validation.

**Algorithm Description:**

Here the classifier is discriminating images based on 28\*28 pixels i.e. 784 columns. Seventy six columns data had values as zero So, they were dropped as they were insignificant for classification.

**Algorithm results:**

KNeighborsClassifier(algorithm='auto', leaf\_size=30, metric='euclidean',

metric\_params=None, n\_jobs=-1,n\_neighbors=11,p=2,

weights='uniform')

The classifier here is discriminating based on 11 neighbors i.e. pixels.

Y\_pred =cross\_val\_predict(classifier,X,Y,cv=10)—does the cross validation.

* confusion matrix(10\*10 ) would be generated see the code.
* cm=confusion\_matrix(Y,Y\_pred)

Accuracy with k=11 is 95.68%.

**Runtime:**

The wall clock time for the program is 580.56 seconds