KNN with Glass Dataset

In [1]:
```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
import matplotlib.pyplot as plt
```

In [2]:
```
df=pd.read_csv("./glass.csv")
df.head()
```

Out[2]:

	RI	Na	Mg	Al	Si	K	Ca	Ba	Fe	Type
0	1.52101	13.64	4.49	1.10	71.78	0.06	8.75	0.0	0.0	1
1	1.51761	13.89	3.60	1.36	72.73	0.48	7.83	0.0	0.0	1
2	1.51618	13.53	3.55	1.54	72.99	0.39	7.78	0.0	0.0	1
3	1.51766	13.21	3.69	1.29	72.61	0.57	8.22	0.0	0.0	1
4	1.51742	13.27	3.62	1.24	73.08	0.55	8.07	0.0	0.0	1

In [3]:
```
#Euclidean Distance

def ec(x1,x2):
    return np.sqrt(np.sum((x1-x2)**2))
```

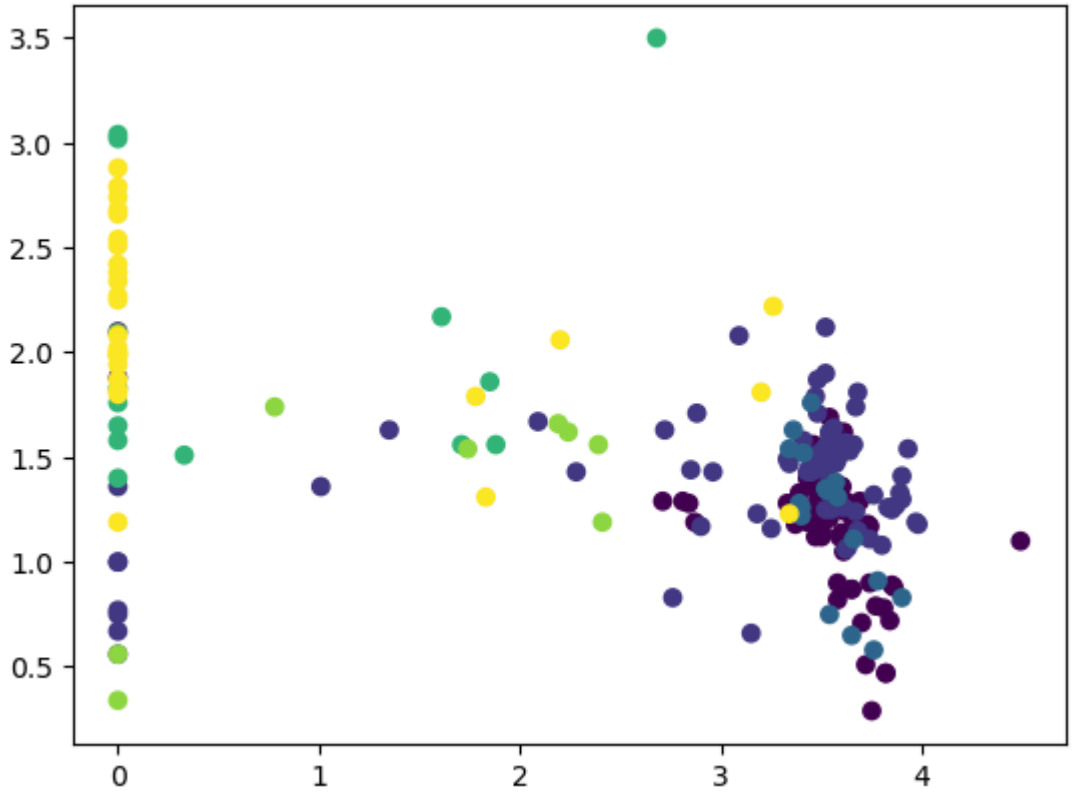
In [4]:
```
from collections import Counter

class KNN:
    def __init__(self,k=3):
        self.k=k

    def fit(self,X,y):
        self.X_train=X
        self.y_train=y

    def predict(self,X):
        predictions=[self._predict(x) for x in X]
        return predictions

    def _predict(self,x):
        #Compute distance from one given point to all the points in X_train
        distances=[ec(x1=x,x2=x_train) for x_train in self.X_train]

        #Get k closest indices and labels
        k_indices=np.argsort(distances)[:self.k]
        k_labels=[self.y_train[i] for i in k_indices]

        #Get most common class label
        co=Counter(k_labels).most_common()
        return co[0][0]
```

In [5]:
```
#Split Data

X=df.drop("Type",axis=1).values
y=df['Type'].values
X_train,X_test,Y_train,Y_test=train_test_split(X,y,test_size=0.3,random_state=40)
```

In [6]:
```
#Fit Model

clf=KNN(k=3)
clf.fit(X_train,Y_train)
predictions=clf.predict(X_test)
```

```
print(predictions)
plt.scatter(X[:,2],X[:,3],c=y)
plt.show()
```

```
[2, 1, 6, 5, 5, 3, 2, 2, 7, 2, 1, 1, 2, 2, 2, 2, 1, 2, 7, 3, 1, 1, 1, 2, 5, 6, 1, 2,
1, 5, 1, 2, 2, 1, 1, 1, 6, 2, 1, 1, 2, 3, 2, 2, 6, 3, 2, 7, 1, 1, 3, 1, 2, 2, 1, 3,
7, 2, 1, 3, 1, 7, 1, 2, 2]
```



In [7]:
```
from sklearn.metrics import accuracy_score
print(accuracy_score(y_pred=predictions,y_true=Y_test))
```

```
0.6307692307692307
```