

```

from IPython.display import Image
from sklearn.cluster import KMeans
import pandas as pd
import matplotlib.pyplot as plt
from matplotlib import style
style.use("ggplot")
%matplotlib inline

```

```
%matplotlib inline
```

```
import pandas as pd
```

```

data = pd.read_csv('/content/drive/MyDrive/datasets/train_MachineLearningCVE.csv');
X = data.iloc[:,1:3]
X = X.values
X

```

```

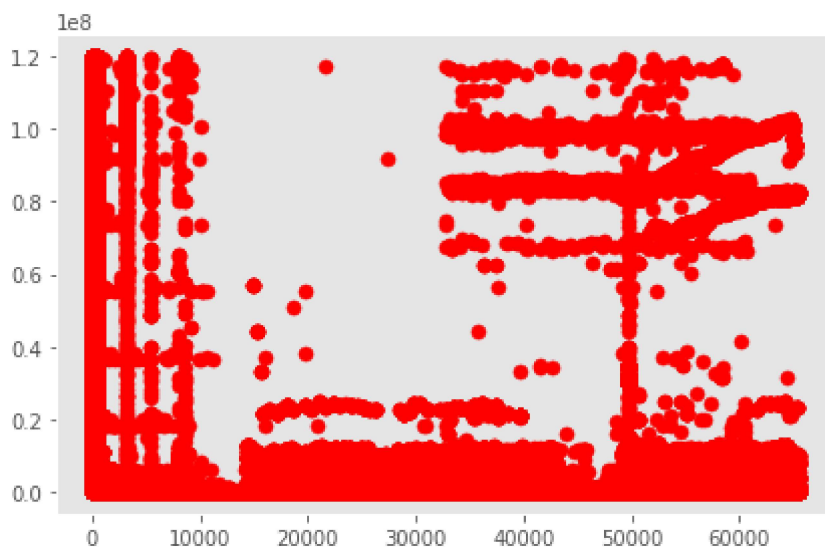
↳ array([[4.4300000e+02, 3.2304900e+05],
        [8.0000000e+01, 3.9270118e+07],
        [4.8480000e+03, 4.3000000e+01],
        ...,
        [7.4900000e+02, 4.3000000e+01],
        [1.7820000e+03, 7.8000000e+01],
        [6.5388000e+04, 7.5929110e+06]])

```

```

plt.scatter(X[:,0],X[:,1], c='red', marker = 'o', s=50)
plt.grid()
plt.tight_layout()
plt.show()

```



```

kmeans = KMeans(n_clusters=3, init='random', n_init=1, max_iter=2, tol=1e-04, random_state=0)
kmeans.fit(X)
centroids = kmeans.cluster_centers_

```

```
labels = kmeans.labels_
```

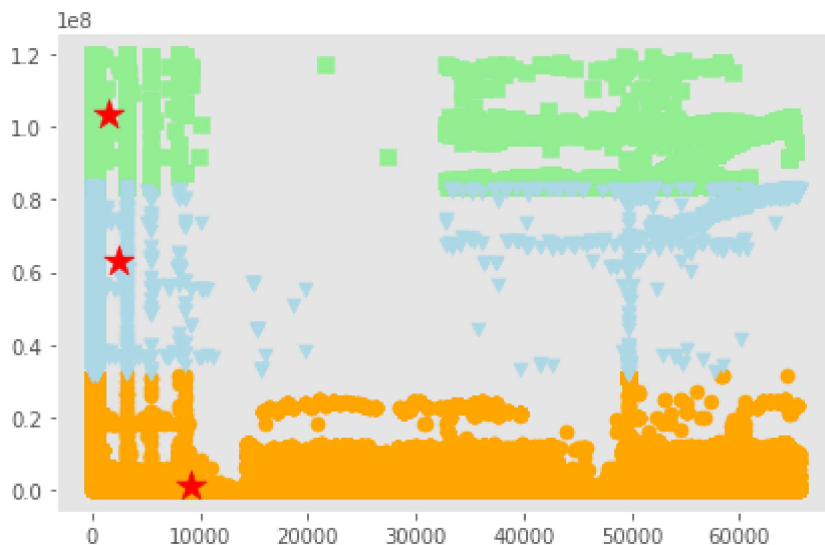
```
print(centroids)
```

```
print(labels)
```

```
[[1.48474386e+03 1.03764621e+08]
 [9.20455415e+03 1.14855129e+06]
 [2.46799965e+03 6.28778253e+07]]
[1 2 1 ... 1 1 1]
```

```
plt.scatter(X[labels == 0,0], X[labels == 0, 1], s= 50, c= 'lightgreen', marker='s', label='c')
plt.scatter(X[labels == 1,0], X[labels == 1, 1], s= 50, c= 'orange', marker='o', label='clust')
plt.scatter(X[labels == 2,0], X[labels == 2, 1], s= 50, c= 'lightblue', marker='v', label='c')
```

```
plt.scatter(centroids[:, 0], centroids[:, 1], s = 250, marker='*', c = 'red', label='centroids')
plt.grid()
plt.tight_layout()
plt.show()
```



```
#Elbow Method
```

```
distortions = []
```

```
for i in range(1, 11):
```

```
    km = KMeans(n_clusters=i, init='k-means++', n_init=10, max_iter=300, random_state=0)
```

```
    km.fit(X)
```

```
    distortions.append(km.inertia_)
```

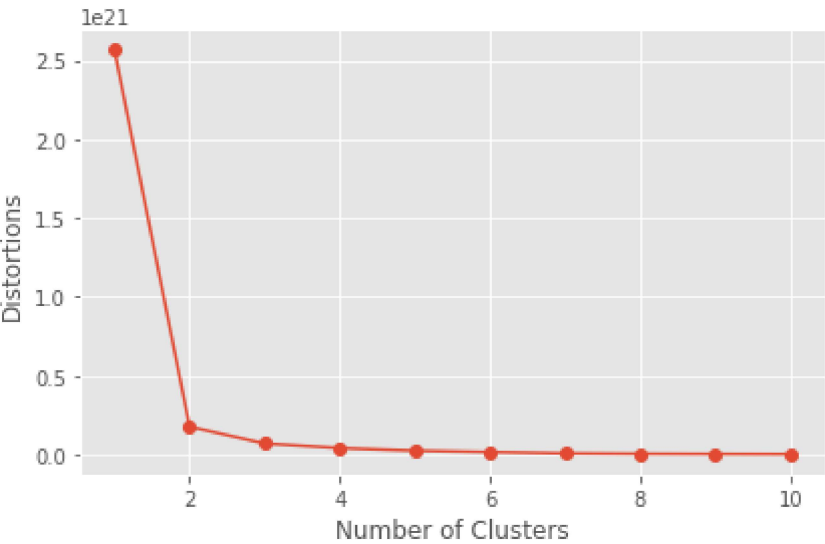
```
plt.plot(range(1,11), distortions, marker='o')
```

```
plt.xlabel('Number of Clusters')
```

```
plt.ylabel('Distortions')
```

```
plt.tight_layout()
```

```
plt.show()
```



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