Task Train a KNN model on glass type dataset and find best n_neighnours.

Data Link: https://drive.google.com/file/d/17cbDNBmys04MJqQfrma3jd72VPMnxIq0/view?usp=share_link

```
# Your code goes here
```

Solution

```
# Importing libraries and functions

import pandas as pd

import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score
from sklearn.preprocessing import MinMaxScaler
```

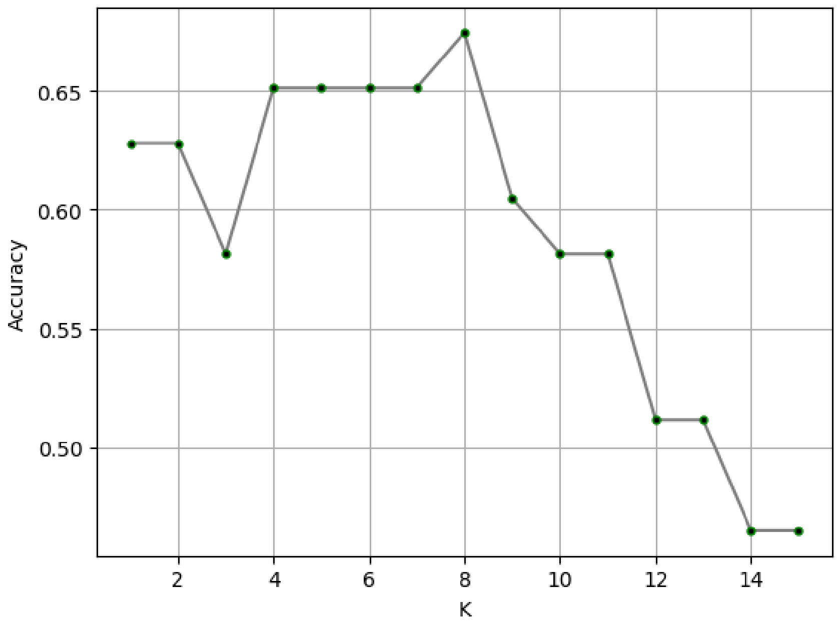
```
# Load the dataset
data = pd.read_csv('/content/glass.csv')
data.drop_duplicates(inplace=True)
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 213 entries, 0 to 213
Data columns (total 10 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   RI      213 non-null    float64
 1   Na      213 non-null    float64
 2   Mg      213 non-null    float64
 3   Al      213 non-null    float64
 4   Si      213 non-null    float64
 5   K       213 non-null    float64
 6   Ca      213 non-null    float64
 7   Ba      213 non-null    float64
 8   Fe      213 non-null    float64
 9   Type    213 non-null    int64
dtypes: float64(9), int64(1)
memory usage: 18.3 KB
```

```
# Separate the features and target variable
X = data.drop('Type', axis=1)
y = data['Type']

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)


# Scaling Data

scaler = MinMaxScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.fit_transform(X_test)


# Creating a model function

def knn_func(train_x, train_label, test_x, k):
    """
    train_x - train features
    train_label - train targets
    test_x - validation data(features)
    k - nearest neighbours <int>
    """
    knn = KNeighborsClassifier(n_neighbors = k)
    knn.fit(train_x, train_label)
    prediction = knn.predict(test_x)
    return prediction


# For best n_neighbours
import math
n = data.shape[0]
k_max = math.sqrt(n)
k_max
```

```
14.594519519326424
```

```
normal_accuracy = []
k_values = range(1,16)

for k in k_values :
    y_pred = knn_func(X_train,y_train,X_test,k)
    accur = accuracy_score(y_test,y_pred)
    normal_accuracy.append(accur)

plt.plot(k_values,normal_accuracy,c="grey",marker=".",ms=7,mfc="black",mec="green")
plt.xlabel("K")
plt.ylabel("Accuracy")
plt.grid(True)
plt.show()
```



- From above graph of Accuracy vs K, best value for **n_beighbours is 8**.

Start coding or generate with AI.

Happy Learning !