

Group Members

Name:- Shivraj Jagtap (227)

Girish Lohkare (238)

Agniv Borah (235)

code of K means:

```
import pandas as pd
from sklearn.cluster import KMeans

# Read the CSV file into a DataFrame
df = pd.read_csv("/content/sample_data/Cardekho1.csv")

# Select the features you want to use for clustering
selected_features = ['selling_price', 'km_driven']

# Extract the selected features from the DataFrame
X = df[selected_features]

# Create a KMeans object with the desired number of clusters
kmeans = KMeans(n_clusters=3)

# Fit the KMeans model to the data
kmeans.fit(X)

# Get the cluster labels assigned to each data point
labels = kmeans.labels_

# Get the cluster centers
cluster_centers = kmeans.cluster_centers_

# Add the cluster labels to the DataFrame
df['cluster'] = labels

# Print the updated DataFrame
print(df)

# Print the cluster centers
print("Cluster Centers:")
for center in cluster_centers:
    print(center)
```

Output:

| | name | year | selling_price | km_driven | fuel | \ |
|---|---------------------------|-------------|---------------|-----------|--------|---|
| 0 | Maruti 800 AC | 2007 | 60000 | 70000 | Petrol | |
| 1 | Maruti Wagon R LXI Minor | 2007 | 135000 | 50000 | Petrol | |
| 2 | Hyundai Verna 1.6 SX | 2012 | 600000 | 100000 | Diesel | |
| 3 | Datsun RediGO T Option | 2017 | 250000 | 46000 | Petrol | |
| 4 | Honda Amaze VX i-DTEC | 2014 | 450000 | 141000 | Diesel | |
| 5 | Maruti Alto LX BSIII | 2007 | 140000 | 125000 | Petrol | |
| 6 | Hyundai Xcent 1.2 Kappa S | 2016 | 550000 | 25000 | Petrol | |
| 7 | Tata Indigo Grand | Petrol 2014 | 240000 | 60000 | Petrol | |

| | | | | | |
|----|---------------------------------|-------------|---------|--------|--------|
| 8 | Hyundai Creta 1.6 VTVT S | 2015 | 850000 | 25000 | Petrol |
| 9 | Maruti Celerio Green VXI | 2017 | 365000 | 78000 | CNG |
| 10 | Chevrolet Sail 1.2 Base | 2015 | 260000 | 35000 | Petrol |
| 11 | Tata Indigo Grand | Petrol 2014 | 250000 | 100000 | Petrol |
| 12 | Toyota Corolla Altis 1.8 VL CVT | 2018 | 1650000 | 25000 | Petrol |
| 13 | Maruti 800 AC | 2007 | 60000 | 70000 | Petrol |
| 14 | Maruti Wagon R LXI Minor | 2007 | 135000 | 50000 | Petrol |
| 15 | Hyundai Verna 1.6 SX | 2012 | 600000 | 100000 | Diesel |
| 16 | Datsun RediGO T Option | 2017 | 250000 | 46000 | Petrol |
| 17 | Honda Amaze VX i-DTEC | 2014 | 450000 | 141000 | Diesel |
| 18 | Maruti Alto LX BSIII | 2007 | 140000 | 125000 | Petrol |

| | seller_type | transmission | owner | cluster |
|----|-------------|--------------|--------------|---------|
| 0 | Individual | Manual | First Owner | 0 |
| 1 | Individual | Manual | First Owner | 0 |
| 2 | Individual | Manual | First Owner | 1 |
| 3 | Individual | Manual | First Owner | 0 |
| 4 | Individual | Manual | Second Owner | 1 |
| 5 | Individual | Manual | First Owner | 0 |
| 6 | Individual | Manual | First Owner | 1 |
| 7 | Individual | Manual | Second Owner | 0 |
| 8 | Individual | Manual | First Owner | 1 |
| 9 | Individual | Manual | First Owner | 0 |
| 10 | Individual | Manual | First Owner | 0 |
| 11 | Individual | Manual | First Owner | 0 |
| 12 | Dealer | Automatic | First Owner | 2 |
| 13 | Individual | Manual | First Owner | 0 |
| 14 | Individual | Manual | First Owner | 0 |
| 15 | Individual | Manual | First Owner | 1 |
| 16 | Individual | Manual | First Owner | 0 |
| 17 | Individual | Manual | Second Owner | 1 |
| 18 | Individual | Manual | First Owner | 0 |

Cluster Centers:

[190416.66666667 71250.]

[583333.33333333 88666.66666667]

[1650000. 25000.]

/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of 'n_init' will change from 10 to 'auto' in 1.4. Set the value of 'n_init' explicitly to suppress the warning
warnings.warn(

Code of KNN:

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import accuracy_score
```

Read the CSV file into a DataFrame

```
df = pd.read_csv("/content/sample_data/car dekkho.csv")
```

Select the features and target variable

```
selected_features = ['year', 'selling_price', 'km_driven', 'fuel', 'seller_type', 'transmission', 'owner']
```

```
target_variable = 'name'
```

```
# Extract the selected features and target variable from the DataFrame
```

```
X = df[selected_features]
```

```
y = df[target_variable]
```

```
# Encode categorical variables
```

```
encoder = LabelEncoder()
```

```
X['fuel'] = encoder.fit_transform(X['fuel'])
```

```
X['seller_type'] = encoder.fit_transform(X['seller_type'])
```

```
X['transmission'] = encoder.fit_transform(X['transmission'])
```

```
X['owner'] = encoder.fit_transform(X['owner'])
```

```
# Split the dataset 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)
```

```
# Create a KNN classifier with k=3
```

```
knn = KNeighborsClassifier(n_neighbors=3)
```

```
# Fit the classifier to the training data
```

```
knn.fit(X_train, y_train)
```

```
# Predict the target variable for the test set
```

```
y_pred = knn.predict(X_test)
```

```
# Calculate the accuracy of the model
```

```
accuracy = accuracy_score(y_test, y_pred)
```

```
print("Accuracy:", accuracy)
```

Output

Accuracy: 0.14285714285714285

<ipython-input-11-09911d8e3e6f>:20: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
X['fuel'] = encoder.fit_transform(X['fuel'])
```

<ipython-input-11-09911d8e3e6f>:21: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
X['seller_type'] = encoder.fit_transform(X['seller_type'])
```

<ipython-input-11-09911d8e3e6f>:22: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
X['transmission'] = encoder.fit_transform(X['transmission'])
```

<ipython-input-11-09911d8e3e6f>:23: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.

Try using `.loc[row_indexer,col_indexer] = value` instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
X['owner'] = encoder.fit_transform(X['owner'])
```

Code of Linear Regression:

```
import pandas as pd
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error

# Read the CSV file into a DataFrame
df = pd.read_csv("/content/sample_data/car dekkho.csv")

# Select the features and target variable
selected_features = ['year', 'km_driven']
target_variable = 'selling_price'

# Extract the selected features and target variable from the DataFrame
X = df[selected_features]
y = df[target_variable]

# 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)

# Create a LinearRegression model
model = LinearRegression()

# Fit the model to the training data
model.fit(X_train, y_train)

# Make predictions on the test data
y_pred = model.predict(X_test)

# Evaluate the model using mean squared error
mse = mean_squared_error(y_test, y_pred)
print("Mean Squared Error:", mse)
```

Output:

Mean Squared Error: 255707328588.57532