EDS Mini Project -(G3)

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Problem Statement: Implement a mini project based on classification (Linear Regression / KNN Classification) or Clustering (K-Means) and also Develop an interactive dashboard using the matplotlib/Seaborn library.

Data set:

A	B	C	D	E
Brand	Category	Price	Color	Size
Zara	T-shirt	19.99	Black	S
H&M	Jeans	39.99	Blue	M
GAP	Hoodie	29.99	Gray	L
Forever 2	Dress	24.99	Red	S
Nike	Shoes	79.99	White	8
Adidas	T-shirt	29.99	Blue	L
Levi's	Jeans	49.99	Black	32
Puma	Shorts	19.99	Gray	XL
Calvin Kle	Underwea	14.99	Black	M
Tommy Hi	Shirt	34.99	White	M

Code:

```
import numpy as nm import matplotlib.pyplot as mtp import
pandas as pd
data_set=pd.read_csv('/content/sample_data/colthing brand.csv')
data_set
```

	Brand	Category	Price	Color	Size
0	Zara	T-shirt	19.99	Black	S
1	H&M	Jeans	39.99	Blue	M
2	GAP	Hoodie	29.99	Gray	L
3	Forever 21	Dress	24.99	Red	S
4	Nike	Shoes	79.99	White	8
5	Adidas	T-shirt	29.99	Blue	L
6	Levi's	Jeans	49.99	Black	32
7	Puma	Shorts	19.99	Gray	XL
8	Calvin Klein	Underwear	14.99	Black	M
9	Tommy Hilfiger	Shirt	34.99	White	M

```
x=data_set.iloc[:,:-1].values
y=data_set.iloc[:,1].values
#splitting the dataset into training and test
set from sklearn.model_selection import
train_test_split x_train, x_test, y_train,
y_test=train_test_split(x,y,test_size=1/3,random
_state=0) print(x_train)
```

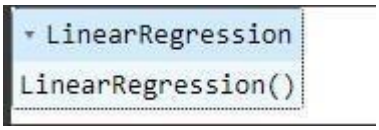
```
[['H&M' 'Jeans' 39.99 'Blue']
 ["Levi's" 'Jeans' 49.99 'Black']
 ['Puma' 'Shorts' 19.99 'Gray']
 ['Forever 21' 'Dress' 24.99 'Red']
 ['Zara' 'T-shirt' 19.99 'Black']
 ['Adidas' 'T-shirt' 29.99 'Blue']]
```

Linear Regression

```
#linear regression import pandas as pd from sklearn.linear_model
import LinearRegression from sklearn.preprocessing import
```

```
LabelEncoder,                                                    OneHotEncoder
data_set=pd.read_csv('/content/sample_data/colthing brand.csv')
data_set

df = pd.DataFrame(data_set)
# Create a linear regression object
model = LinearRegression()
 model.fit(X_train,
y_train)
```

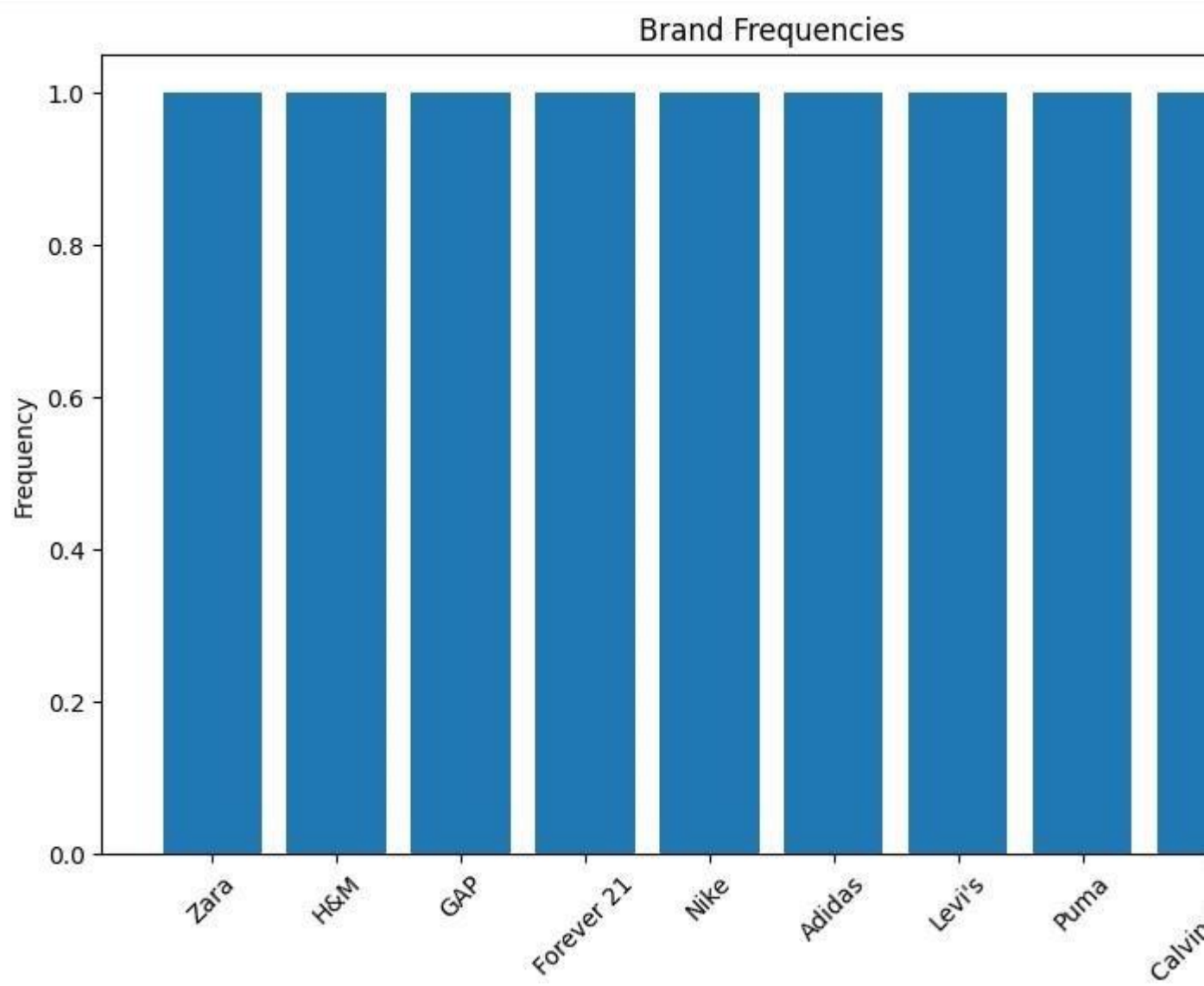



```
#print the coefficient print("Intercept:", model.intercept_) #
Intercept term
print("Coefficients:", model.coef_) # Coefficients for each
feature
```

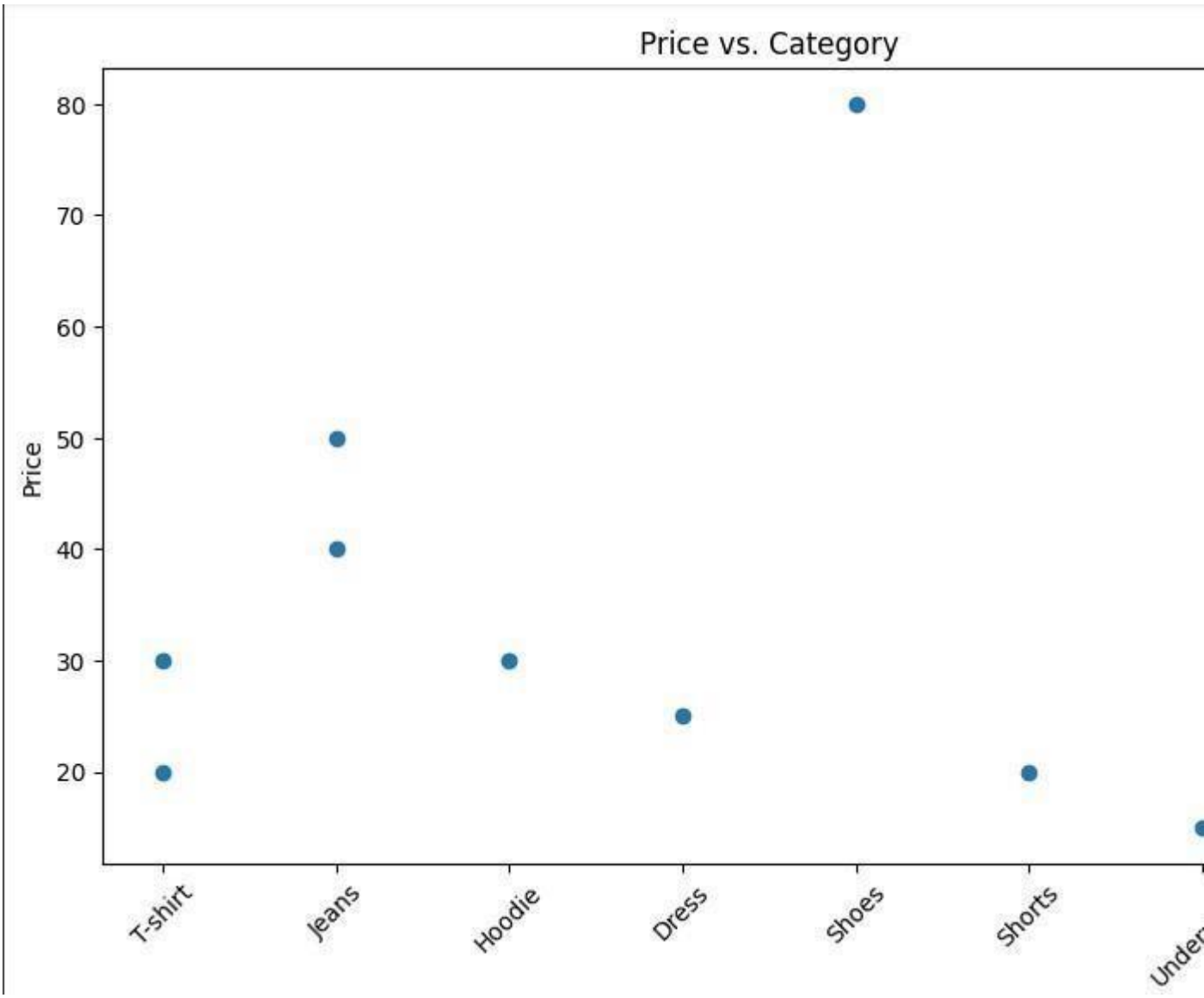
```
Intercept: 7.105427357601002e-15
Coefficients: [ 8.09593144e-16  1.66533454e-15  1.00000000e+00  7.35522754e-16
 -2.59514632e-15]
```

Code:Visualization

```
#visaulization
#bar plot of brand frequencies brand_counts =
df['Brand'].value_counts() plt.figure(figsize=(10, 6))
plt.bar(brand_counts.index, brand_counts.values)
plt.xlabel('Brand') plt.ylabel('Frequency') plt.title('Brand
Frequencies') plt.xticks(rotation=45) plt.show()
```

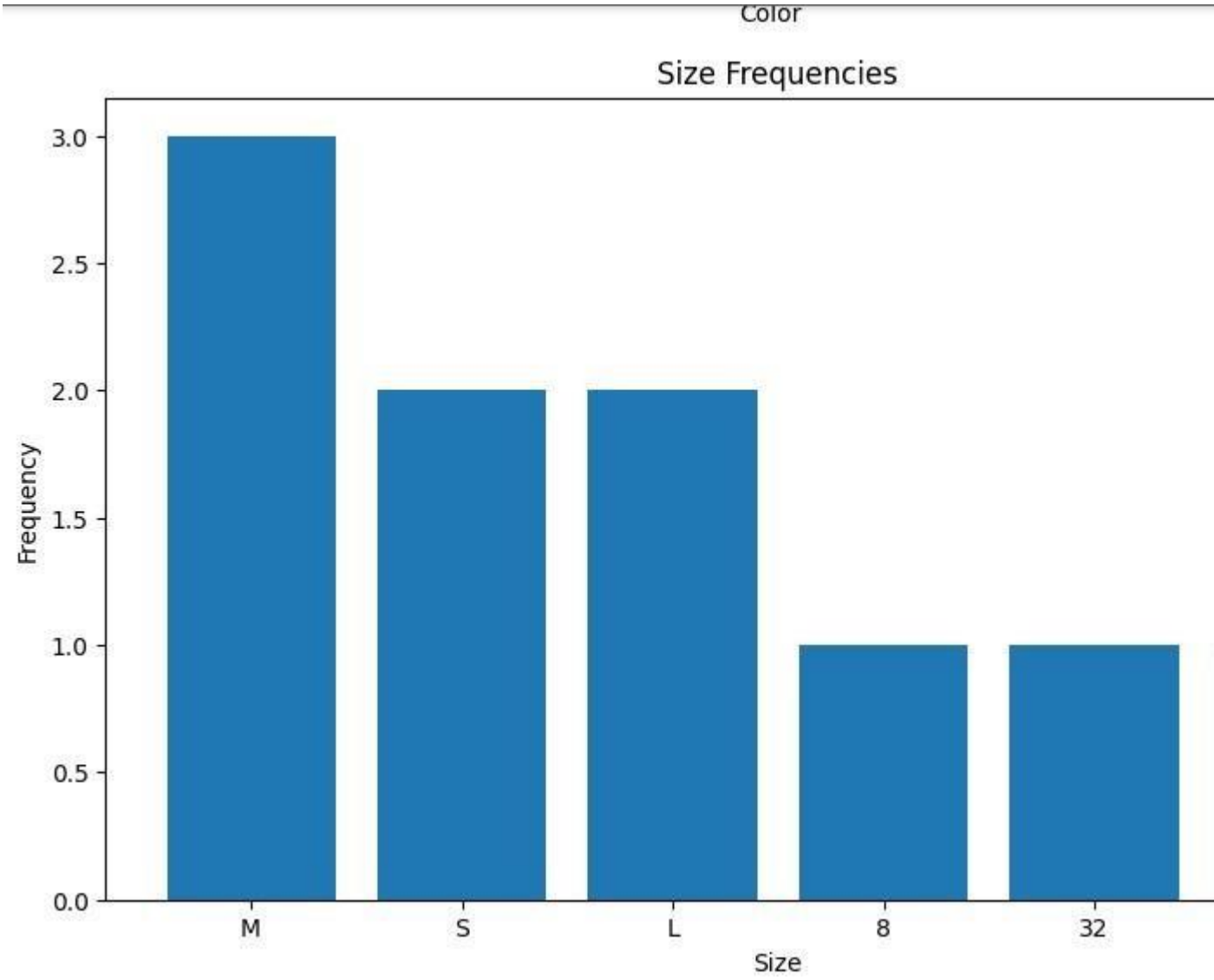

Brand Frequencies
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
Zara
H&M
GAP
Forever 21
Nike
Adidas
Levi's
Puma

```
# Scatter plot of price vs. category
plt.figure(figsize=(10, 6))
plt.scatter(df['Category'], df['Price'])
plt.xlabel('Category')
plt.ylabel('Price') plt.title('Price vs.
Category') plt.xticks(rotation=45)
plt.show()
```




```
# Bar plot of size frequencies size_counts
=                df['Size'].value_counts()
plt.figure(figsize=(10,                6))
plt.bar(size_counts.index,
size_counts.values)      plt.xlabel('Size')
```

```
plt.ylabel('Frequency')      plt.title('Size
Frequencies')
plt.show()
```



Code: Manupulation

```
#manupulation
import pandas as pd

# Create the dataset
data_set=pd.read_csv('/content/sample_data/colthing
brand.csv') data_set df = pd.DataFrame(data_set)

# Select specific columns
selected_columns = df[['Brand', 'Price']]
print(selected_columns)
```

	Brand	Price
0	Zara	19.99
1	H&M	39.99
2	GAP	29.99
3	Forever 21	24.99
4	Nike	79.99
5	Adidas	29.99
6	Levi's	49.99
7	Puma	19.99
8	Calvin Klein	14.99
9	Tommy Hilfiger	34.99

```
# Filter rows based on conditions
filtered_rows = df[df['Price'] > 30]
print(filtered_rows)
```

	Brand	Category	Price	Color	Size
1	H&M	Jeans	39.99	Blue	M
4	Nike	Shoes	79.99	White	8
6	Levi's	Jeans	49.99	Black	32
9	Tommy Hilfiger	Shirt	34.99	White	M

```
# Sort the dataframe by a column sorted_df =
df.sort_values('Price', ascending=False)
print(sorted_df)
```

	Brand	Category	Price	Color	Size
4	Nike	Shoes	79.99	White	8
6	Levi's	Jeans	49.99	Black	32
1	H&M	Jeans	39.99	Blue	M
9	Tommy Hilfiger	Shirt	34.99	White	M
2	GAP	Hoodie	29.99	Gray	L
5	Adidas	T-shirt	29.99	Blue	L
3	Forever 21	Dress	24.99	Red	S
0	Zara	T-shirt	19.99	Black	S
7	Puma	Shorts	19.99	Gray	XL
8	Calvin Klein	Underwear	14.99	Black	M

```
# Group data and calculate statistics
grouped_data = df.groupby('Category').mean()
print(grouped_data)
```

Category	Price
Dress	24.99
Hoodie	29.99
Jeans	44.99
Shirt	34.99
Shoes	79.99
Shorts	19.99
T-shirt	24.99
Underwear	14.99

```
# Remove duplicate rows df = df.drop_duplicates()
print(df)
```

	Brand	Category	Price	Color	Size
0	Zara	T-shirt	19.99	Black	S
1	H&M	Jeans	39.99	Blue	M
2	GAP	Hoodie	29.99	Gray	L
3	Forever 21	Dress	24.99	Red	S
4	Nike	Shoes	79.99	White	8
5	Adidas	T-shirt	29.99	Blue	L
6	Levi's	Jeans	49.99	Black	32
7	Puma	Shorts	19.99	Gray	XL
8	Calvin Klein	Underwear	14.99	Black	M
9	Tommy Hilfiger	Shirt	34.99	White	M

Code: K-means clustering

```
#k-means clustering
# Preprocess categorical variables
label_encoders = {}
categorical_cols = ['Brand', 'Category', 'Color', 'Size']

for col in categorical_cols:
    label_encoders[col] = LabelEncoder()
    df[col] = label_encoders[col].fit_transform(df[col])

# Select the features for clustering X
= df[['Price', 'Color', 'Size']]

# Perform K-Means Clustering k = 3 # Number
of clusters kmeans = KMeans(n_clusters=k,
random_state=42) kmeans.fit(X)

# Get the cluster labels for each data point
cluster_labels = kmeans.labels_


# Add the cluster labels to the dataframe df['Cluster'] =
cluster_labels

#  Print  the  cluster  labels  for  each  data  point
print(df[['Brand', 'Cluster']])

# Get the cluster centers
cluster_centers = kmeans.cluster_centers_
# Print the cluster centers print("Cluster Centers:")
for   i,   center   in   enumerate(cluster_centers):
print("Cluster", i+1, "Center:", center)
```

```
   Brand  Cluster
0      9        1
1      4        0
2      3        1
3      2        1
4      6        2
5      0        1
6      5        0
7      7        1
8      1        1
9      8        0
Cluster Centers:
Cluster 1 Center: [41.65666667  1.66666667  2.        ]
Cluster 2 Center: [23.32333333  1.33333333  3.33333333]
Cluster 3 Center: [79.99  4.    1.  ]
```

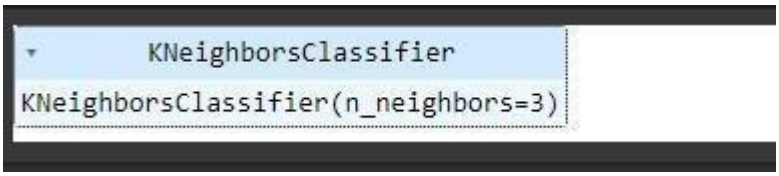
Code: KNN clasification

```
#KNN clasification
# Preprocess categorical variables
label_encoders = {}
categorical_cols = ['Brand', 'Category', 'Color', 'Size']

for col in categorical_cols:
    label_encoders[col] = LabelEncoder()
    df[col] = label_encoders[col].fit_transform(df[col])

# Select features and target
variable X = df[['Price', 'Color',
'Size']] y = df['Brand']
# 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)

# Perform K-NN Classification k = 3 #
Number of neighbors knn =
KNeighborsClassifier(n_neighbors=k)
knn.fit(X_train, y_train)
```




```
# Predict on 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)
```

```
Accuracy: 0.0
```