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import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler

df = pd.read_csv("luna_pets.csv")

print(df.head())

      X      Y      Z      R      G      B  Intensity
0  731000.31  9246012.06  3317.59  126  119  163    5911.0
1  731002.53  9246010.16  3316.46  118  110  160    6939.0
2  731000.50  9246012.30  3316.79  127  121  159    3855.0
3  731000.25  9246012.73  3317.08  126  120  157    5654.0
4  731001.47  9246010.60  3317.28  121  114  159    4369.0

X = df.drop(['X', 'Y'], axis=1)

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

n_clusters = 3

kmeans = KMeans(n_clusters=n_clusters, random_state=42)
kmeans.fit(X_scaled)

df['cluster'] = kmeans.labels_

print("Centros dos Clusters:")
print(scaler.inverse_transform(kmeans.cluster_centers_))

Centros dos Clusters:
[[3317.23576923  123.57692308  116.73076923  161.61538462  5337.69230769]
 [3316.0415      131.1         124.4         163.75         5705.4         ]
 [3316.02769231  115.53846154  108.84615385  151.         7018.07692308]]

plt.figure(figsize=(10, 6))

<Figure size 1000x600 with 0 Axes>
<Figure size 1000x600 with 0 Axes>

for cluster in range(n_clusters):
    cluster_data = df[df['cluster'] == cluster]
    plt.scatter(cluster_data['X'], cluster_data['Y'], label=f'Cluster {cluster}')

plt.title('Clusters de Dados de Habitação na Califórnia')
plt.xlabel('X')
plt.ylabel('Y')
plt.legend()
plt.show()

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