

LAMPIRAN

Lampiran 1 Pengujian Silhouette Score dan DBI

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import pandas as pd
from sklearn.cluster import KMeans
from sklearn.metrics import silhouette_score,
davies_bouldin_score
import matplotlib.pyplot as plt

# 1. Baca file Excel
data = pd.read_excel('hasil-clustering.xlsx')

# 2. Ubah kolom yang diperlukan menjadi numerik
data['jml_longsor'] =
pd.to_numeric(data['jml_longsor'], errors='coerce')
data['curah_hujan'] =
pd.to_numeric(data['curah_hujan'], errors='coerce')
data['kemiringan'] =
pd.to_numeric(data['kemiringan'], errors='coerce')
data['jenis_tanah'] =
pd.to_numeric(data['jenis_tanah'], errors='coerce')

# 3. Hapus baris yang memiliki nilai NaN
data.dropna(subset=['jml_longsor', 'curah_hujan',
'kemiringan', 'jenis_tanah'], inplace=True)

# 4. Ambil fitur numerik untuk clustering
features = data[['jml_longsor', 'curah_hujan',
'kemiringan', 'jenis_tanah']].values

# 5. Uji Silhouette Score dan DBI untuk K = 3
k = 3
kmeans = KMeans(n_clusters=k, random_state=42,
n_init=10)
labels = kmeans.fit_predict(features)

sil_score = silhouette_score(features, labels)
dbi_score = davies_bouldin_score(features, labels)

print(f"Hasil Evaluasi Clustering (K = {k}):")
print(f"Silhouette Score = {sil_score:.4f}")
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print(f"Davies-Bouldin Index = {dbi_score:.4f}")

# 6. (Opsional) Visualisasi jika ingin mengembangkan
untuk K berbeda
k_range = [2, 3, 4, 5]
silhouette_scores = []
dbi_scores = []

for k in k_range:
    model = KMeans(n_clusters=k, random_state=42,
n_init=10)
    labels = model.fit_predict(features)

    sil = silhouette_score(features, labels)
    dbi = davies_bouldin_score(features, labels)

    silhouette_scores.append(sil)
    dbi_scores.append(dbi)

# 7. Plot hasil evaluasi
plt.figure(figsize=(10, 5))
plt.plot(k_range, silhouette_scores, marker='o',
label='Silhouette Score')
plt.plot(k_range, dbi_scores, marker='o',
label='Davies-Bouldin Index')
plt.title('Evaluasi K-Means Clustering (K = 2 hingga
5)')
plt.xlabel('Jumlah Cluster (K)')
plt.ylabel('Nilai Evaluasi')
plt.grid(True)
plt.legend()
plt.tight_layout()
plt.savefig('evaluasi_kmeans_banjarnegara.png') #
Simpan grafik
plt.show()

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