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In [2]: # Muskandeep kaur
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# MCS(FYIC)
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.datasets import make_blobs
from sklearn.cluster import KMeans

# Generate sample dataset
X, _ = make_blobs(n_samples=500, centers=5, cluster_std=1.0, random_sta

# Convert the numpy array to a pandas DataFrame
df = pd.DataFrame(X, columns=['Feature 1', 'Feature 2'])

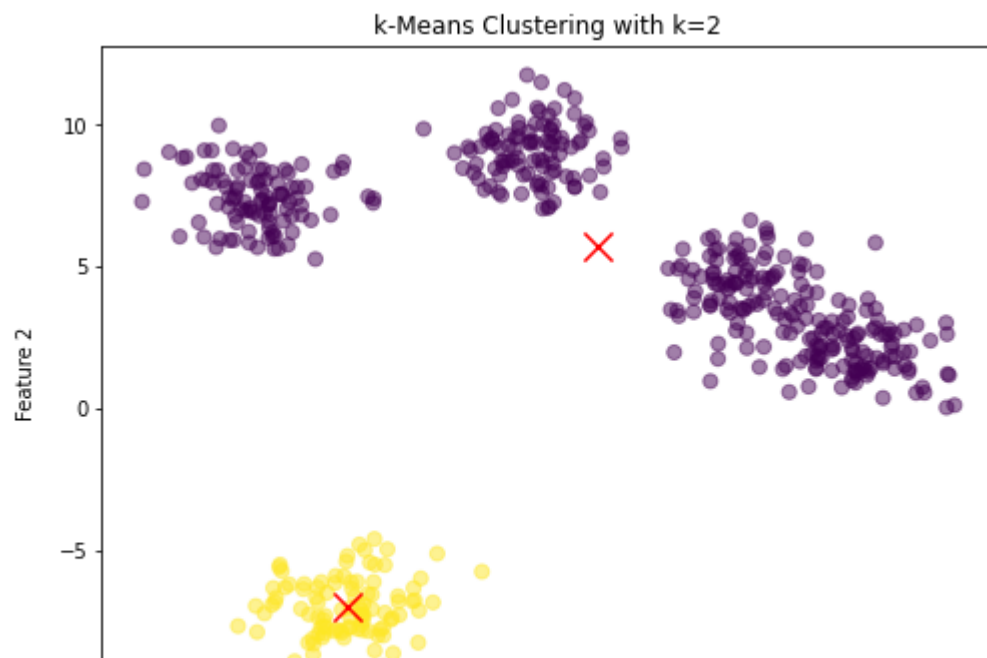
# Experiment with different k values
k_values = [2, 3, 4, 5, 6]

for k in k_values:
    # Initialize KMeans with k clusters
    kmeans = KMeans(n_clusters=k, random_state=42)
    # Fit the model to the data
    kmeans.fit(df)

    # Add cluster labels to the DataFrame
    df['Cluster'] = kmeans.labels_

    # Get cluster centers
    cluster_centers = kmeans.cluster_centers_

    # Plot the clusters
    plt.figure(figsize=(8, 6))
    plt.scatter(df['Feature 1'], df['Feature 2'], c=df['Cluster'], cmap
    plt.scatter(cluster_centers[:, 0], cluster_centers[:, 1], c='red',
    plt.title(f'k-Means Clustering with k={k}')
    plt.xlabel('Feature 1')
    plt.ylabel('Feature 2')
    plt.show()
```



In []: