```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler
from ucimlrepo import fetch_ucirepo

dataset = fetch_ucirepo(id=488)
raw_features = dataset.data.features
raw_targets = dataset.data.targets

numeric_data = raw_features.drop(columns=['status_type',
'status_published'])

scaler = StandardScaler()
scaled_data = scaler.fit_transform(numeric_data)

num_clusters = 3
model = KMeans(n_clusters=num_clusters, init='k-means++',
random_state=42)
model.fit(scaled_data)

cluster_centers = model.cluster_centers_
print(cluster_centers)

data_2d = scaled_data[:, 1:3]
centers_2d = cluster_centers[:, 1:3]

grid_resolution = 0.1
x_range = np.arange(data_2d[:, 0].min() - 1, data_2d[:, 0].max() + 1,
grid_resolution)
y_range = np.arange(data_2d[:, 1].min() - 1, data_2d[:, 1].max() + 1,
grid_resolution)
xx, yy = np.meshgrid(x_range, y_range)
grid_points = np.c_[xx.ravel(), yy.ravel()]

model_2d = KMeans(n_clusters=num_clusters, init='k-means++',
random_state=42)
model_2d.fit(data_2d)
predicted_labels = model_2d.predict(grid_points)
predicted_labels = predicted_labels.reshape(xx.shape)

plt.figure(figsize=(10, 6))
plt.clf()
plt.imshow(predicted_labels, interpolation='nearest',
           extent=(x_range.min(), x_range.max(), y_range.min(),
y_range.max()),
           cmap=plt.cm.Paired, aspect='auto', origin='lower')

plt.scatter(data_2d[:, 0], data_2d[:, 1], c='black', edgecolor='k',
s=20)
```

```
plt.scatter(centers_2d[:, 0], centers_2d[:, 1],
            marker='x', s=200, linewidths=3, color='white')
plt.title("K-Means Clustering on Facebook Seller Posts (2D
Projection)")
plt.xlabel("Feature 2 (scaled)")
plt.ylabel("Feature 3 (scaled)")
plt.show()
```

fb.py

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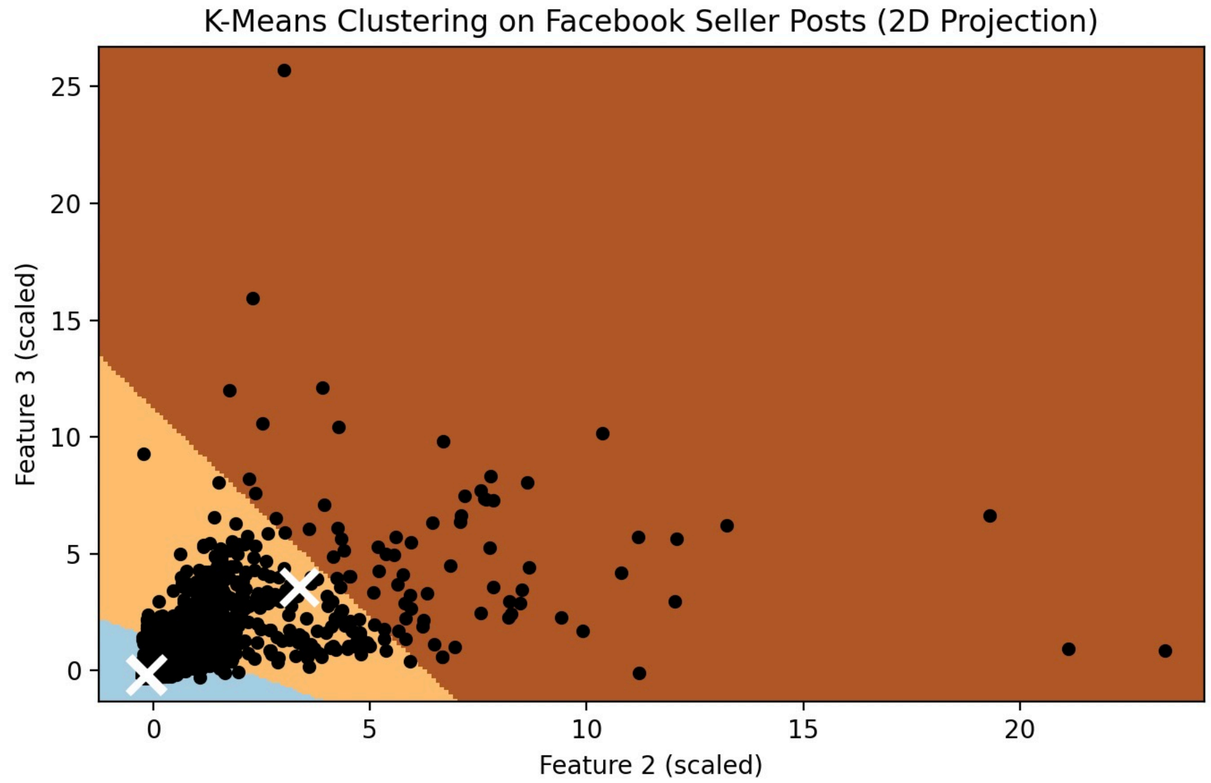
```
35  predicted_labels = predicted_labels.reshape(xx.shape)
36
37  plt.figure(figsize=(10, 6))
38  plt.clf()
39  plt.imshow(predicted_labels, interpolation='nearest',
40             extent=(x_range.min(), x_range.max(), y_range.min(), y_range.
41             cmap=plt.cm.Paired, aspect='auto', origin='lower')
42
43  plt.scatter(data_2d[:, 0], data_2d[:, 1], c='black', edgecolor='k', s=20
44  plt.scatter(centers_2d[:, 0], centers_2d[:, 1],
45              marker='x', s=200, linewidths=3, color='white')
46  plt.title("K-Means Clustering on Facebook Seller Posts (2D Projection)")
47  plt.xlabel("Feature 2 (scaled)")
48  plt.ylabel("Feature 3 (scaled)")
49  plt.show()
50
```

Figure 1



PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
tarikglushko@MBP-Tarik ~ % /usr/bin/python3 /Users/tarikglushko/Downloads/fb.py
/usr/bin/python3 /Users/tarikglushko/Downloads/fb.py
[[-0.25132849 -0.13279108 -0.13915302 -0.24418884 -0.13169885 -0.08482994
  -0.0901906  -0.05942104 -0.08141775]
 [ 1.20355309  3.3651991   3.55859537  0.87052666  3.41794709  1.81112129
   2.28734426  1.57450635  2.11233342]
 [ 3.44405643 -0.18325934 -0.21564903  3.56552625 -0.24077535  0.13145062
  -0.12573702 -0.13238837 -0.14835034]]
```

zsh
Python