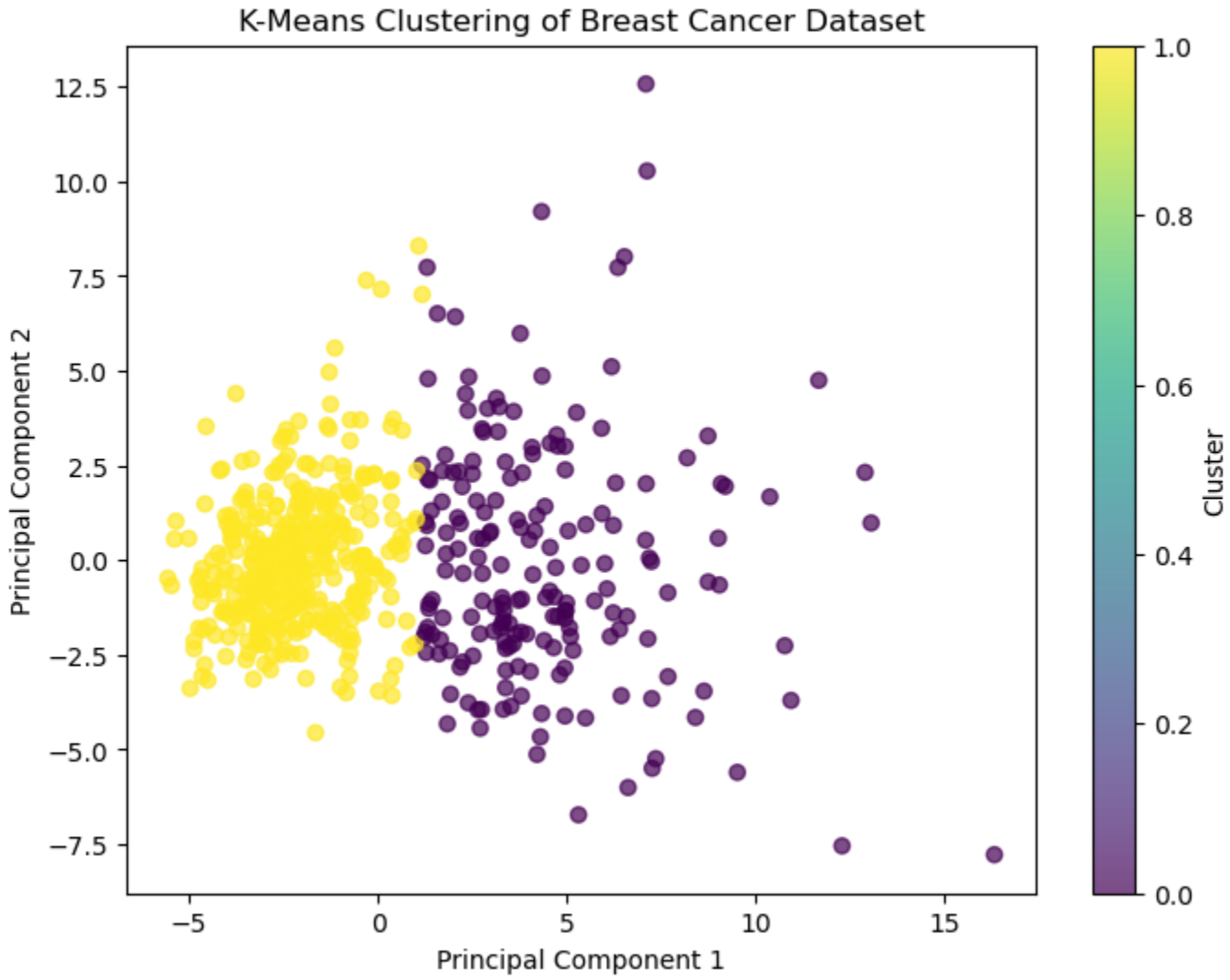
10. Develop a program to implement k-means clustering using Wisconsin Breast Cancer data set and visualize the clustering result.

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.datasets import load_breast_cancer
from sklearn.preprocessing import StandardScaler
from sklearn.cluster import KMeans
from sklearn.decomposition import PCA

# Load the dataset
data = load_breast_cancer()
X = data.data  # Features
y = data.target  # Labels (not used in clustering)

# Standardize the features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# Apply K-Means clustering
kmeans = KMeans(n_clusters=2, random_state=42, n_init=10)
kmeans.fit(X_scaled)
labels = kmeans.labels_

# Reduce dimensions using PCA for visualization
pca = PCA(n_components=2)
X_pca = pca.fit_transform(X_scaled)

# Plot the clusters
plt.figure(figsize=(8, 6))
plt.scatter(X_pca[:, 0], X_pca[:, 1], c=labels, cmap='viridis', alpha=0.7)
plt.xlabel('Principal Component 1')
plt.ylabel('Principal Component 2')
plt.title('K-Means Clustering of Breast Cancer Dataset')
plt.colorbar(label='Cluster')
plt.show()
```

Output


K-Means Clustering of Breast Cancer Dataset
Principal Component 2
Principal Component 1
Cluster
12.5
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−5
0
5
10
15
1.0
0.8
0.6
0.4
0.2
0.0