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import matplotlib.pyplot as plt
from sklearn.datasets import make blobs
from sklearn.cluster import KMeans
# Step 1: Generate a synthetic dataset
X, _ = make_blobs(n_samples=300, centers=3, random_state=42)
# Step 2: Perform clustering using KMeans
kmeans = KMeans(n clusters=3, random state=42)
kmeans.fit(X)
labels = kmeans.labels
# Count the number of points in each cluster
unique_labels, counts = np.unique(labels, return_counts=True)
# Step 3: Visualize the clusters using a pie chart
plt.figure(figsize=(8, 8))
plt.pie(counts, labels=unique_labels, autopct='%1.1f%%',
startangle=140, colors=['#ff9999','#66b3ff','#99ff99'])
plt.title('Cluster Distribution')
plt.axis('equal') # Equal aspect ratio ensures that pie is
drawn as a circle.
plt.show()
```