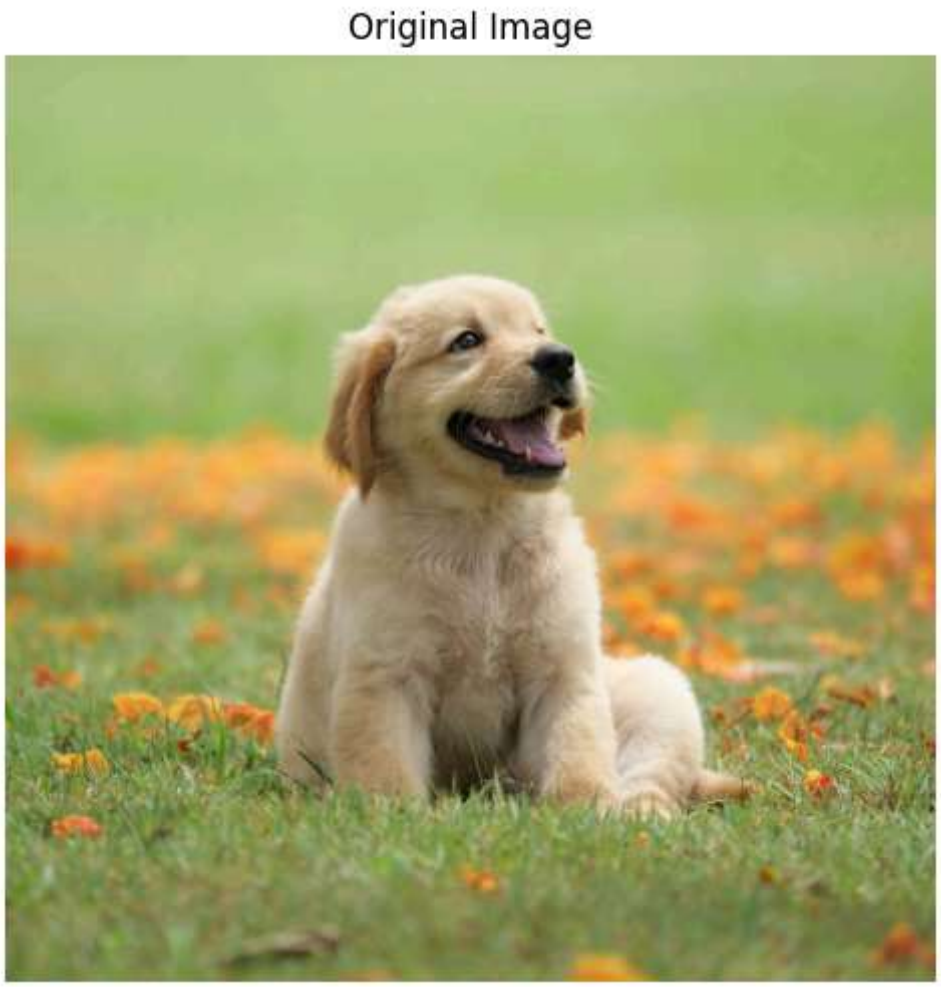
In [ ]:
```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
import cv2
```

In [ ]:
```
# Load sample image
image_bgr = cv2.imread("test_image.jpg")
image = cv2.cvtColor(image_bgr, cv2.COLOR_BGR2RGB)

plt.figure(figsize=(8, 6))
plt.imshow(image_rgb)
plt.title("Original Image")
plt.axis("off")
plt.show()
```



In [ ]:
```
# Reshape the image to a 2D array of pixels
w, h, d = original_shape = tuple(image.shape)
image_array = np.reshape(image, (w * h, d))

# Perform k-means clustering
n_colors = 5  # Number of clusters (colors)
kmeans = KMeans(n_clusters=n_colors, random_state=0)
kmeans.fit(image_array)
```

```
# Get labels and cluster centers
labels = kmeans.predict(image_array)
centers = kmeans.cluster_centers_

# Create segmented image using the cluster centers
segmented_image = np.zeros_like(image_array)
for i in range(len(labels)):
    segmented_image[i] = centers[labels[i]]

# Reshape segmented image to original shape
segmented_image = segmented_image.reshape((w, h, d))

# Display segmented image
plt.figure(figsize=(8, 6))
plt.imshow(segmented_image)
plt.title("Segmented Image")
plt.axis("off")
plt.show()
```

```
c:\Users\a21ma\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\cluster\_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning
  warnings.warn(
```