MODULE 1 –

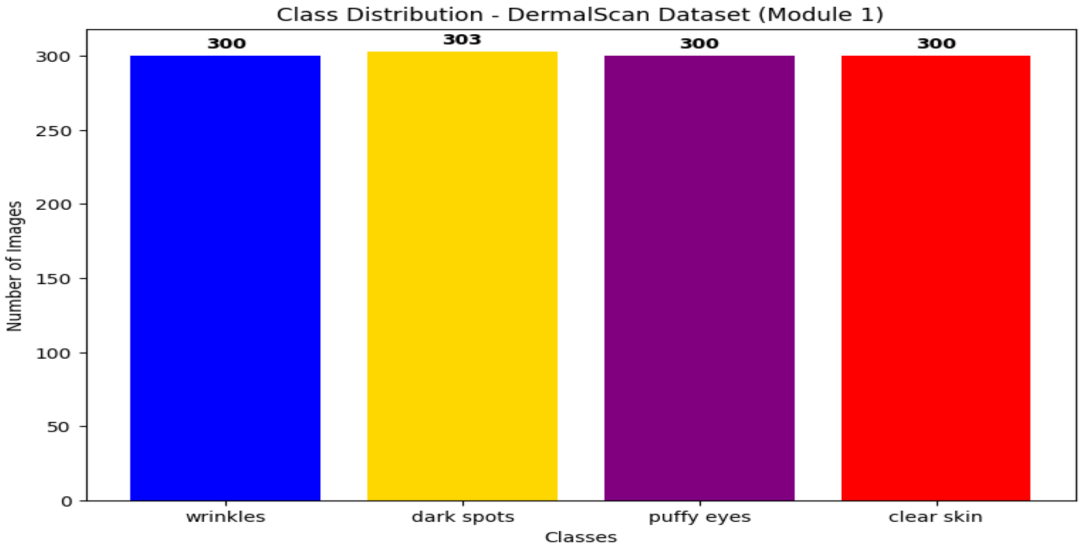
```
import os
data_dir = r"C:\Users\akhta\Downloads\Downloads 2025\Self Development\Projects\DermalScan\Dermal
Scan Main\dataset_clean"

classes = ["wrinkles", "dark spots", "puffy eyes", "clear skin"]

counts = {}

for c in classes:
    folder = os.path.join(data_dir, c)

    img_count = len([file for file in os.listdir(folder) if file.lower().endswith(('.jpg',
'.png', '.jpeg'))])
    counts[c] = img_count

print(counts)
```

OUTPUT –

```
{'wrinkles': 300, 'dark spots': 303, 'puffy eyes': 300, 'clear skin': 300}
```

```
import matplotlib.pyplot as plt

labels = list(counts.keys())
values = list(counts.values())

colors = ['blue', 'gold', 'purple', 'red']

plt.figure(figsize=(9,6))
bars = plt.bar(labels, values, color=colors)

plt.title("Class Distribution - DermalScan Dataset (Module 1)")
plt.xlabel("Classes")
plt.ylabel("Number of Images")

for bar in bars:
    height = bar.get_height()
    plt.text(
        bar.get_x() + bar.get_width() / 2,
        height + 3,
        f"{height}",
        ha='center', va='bottom', fontsize=10, fontweight='bold'
    )

plt.show()
```

OUTPUT –

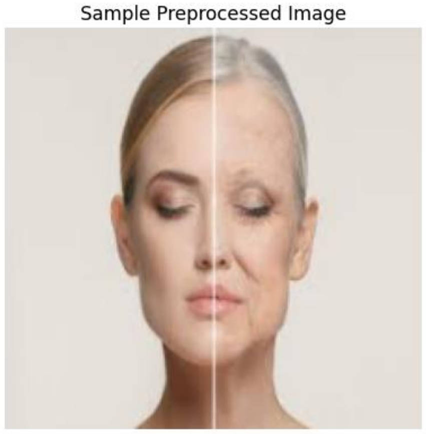


MODULE 2 –

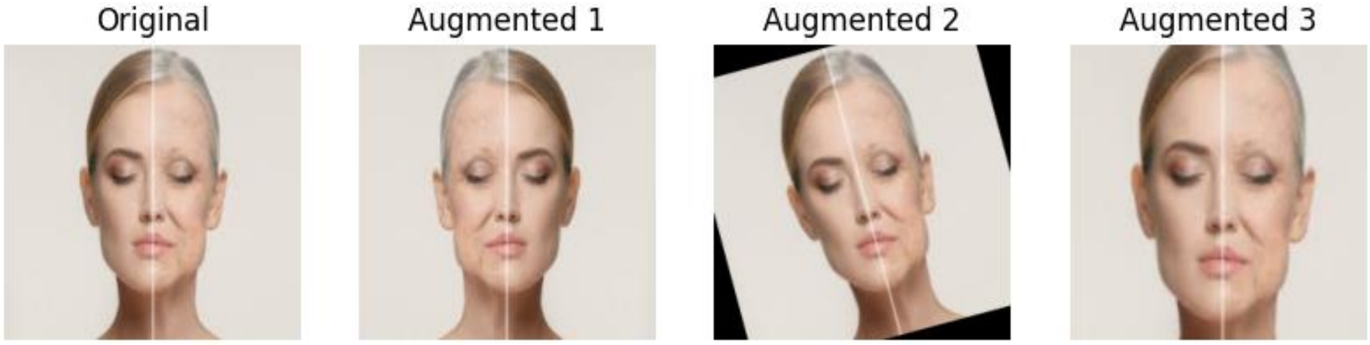
```
import os
import numpy as np
import cv2
import matplotlib.pyplot as plt
data_dir = r"C:\Users\akhta\Downloads\Downloads 2025\Self Development\Projects\DermalScan\Dermal
Scan Main\dataset_clean"

classes = ["wrinkles", "dark spots", "puffy eyes", "clear skin"]
img_size = 224
X = []
y = []

for idx, cls in enumerate(classes):
    folder_path = os.path.join(data_dir, cls)

    for img_name in os.listdir(folder_path):
        if img_name.lower().endswith((".jpg", ".png", ".jpeg")):
            img_path = os.path.join(folder_path, img_name)

            img = cv2.imread(img_path)
            if img is None:
                continue

            img = cv2.resize(img, (img_size, img_size))
            X.append(img)
            y.append(idx)

print("Total images loaded:", len(X))
X = np.array(X, dtype="float32") / 255.0
y = np.array(y)

print("Image data shape:", X.shape)
print("Label data shape:", y.shape)
sample_img = (X[0] * 255).astype("uint8")
sample_img = cv2.cvtColor(sample_img, cv2.COLOR_BGR2RGB)

plt.imshow(sample_img)
plt.title("Sample Preprocessed Image")
plt.axis("off")
plt.show()
def augment_image(img):
    augmented = []

    # horizontal flip
    augmented.append(cv2.flip(img, 1))

    # rotate
    h, w = img.shape[:2]
    M = cv2.getRotationMatrix2D((w//2, h//2), 15, 1)
    augmented.append(cv2.warpAffine(img, M, (w, h)))

    # zoom
    zoom = img[20:200, 20:200]
    zoom = cv2.resize(zoom, (img_size, img_size))
    augmented.append(zoom)

    return augmented
original = (X[0] * 255).astype("uint8")
augmented_imgs = augment_image(original)

plt.figure(figsize=(10,4))

plt.subplot(1,4,1)
plt.imshow(cv2.cvtColor(original, cv2.COLOR_BGR2RGB))
plt.title("Original")
plt.axis("off")

for i, aug in enumerate(augmented_imgs):

    plt.subplot(1,4,i+2)
    plt.imshow(cv2.cvtColor(aug, cv2.COLOR_BGR2RGB))
    plt.title(f"Augmented {i+1}")
    plt.axis("off")

plt.show()
num_classes = len(classes)

y_onehot = np.zeros((y.shape[0], num_classes))
for i, label in enumerate(y):
    y_onehot[i, label] = 1

print("One-hot label shape:", y_onehot.shape)
```

OUTPUT -

```
Total images loaded: 1203
Image data shape: (1203, 224, 224, 3)
Label data shape: (1203,)
```



Sample Preprocessed Image



Original

Augmented 1

Augmented 2

Augmented 3

```
One-hot label shape: (1203, 4)
```