DIP Assignment 1

CS20B1012
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Problem statement:

1. Convert the given Lena image to grayscale image. Use the cv2.resize() to down sample the image with 4 sizes (128*128, 64*64, 32*32, and 16*16). Display the original image, and down sampled images with the same display size. Observe what happens.
2. Down sample the grayscale Lena image with 8 different intensity ranges of values (0-255, 0-128, 0-64, 0-32, 0-16, 0-8, 0-4, and 0-2). (Note: Size of images are the same). And display all those 8 downsampled images in the same size display area on the screen. Observe what happens.
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Code 1:

```python
# CS20B1012
# Muhammad Fazil K

# Importing necessary modules
import cv2
import matplotlib.pyplot as plt

# Loading the Lena image
img = cv2.imread("lena.png", cv2.IMREAD_GRAYSCALE)

# Creating a list of down-sampled image shapes
imgSizes = [(128, 128), (64, 64), (32, 32), (16, 16)]

# Down-sampling the image using cv2.resize()
dsImages = [cv2.resize(img, shape) for shape in imgSizes]

# Displaying
fig, axs = plt.subplots(1, len(dsImages) + 1, figsize=(15, 15))
axs[0].imshow(img, cmap="gray")
```
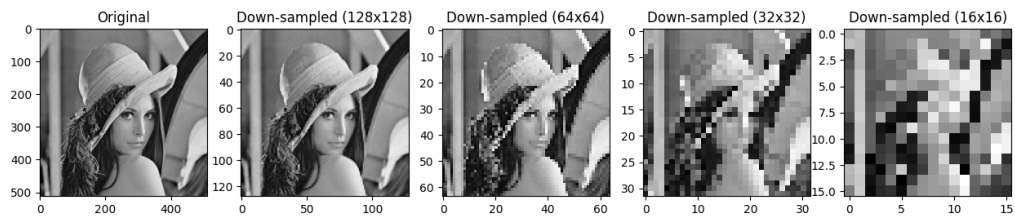
```
axs[0].set_title("Original")
for i, down_img in enumerate(dsImages):
    axs[i + 1].imshow(down_img, cmap="gray")
    axs[i + 1].set_title(f"Down-sampled
({imgSizes[i][0]}x{imgSizes[i][1]})")
plt.show()
```

Output 1 :

Code 2: