

Assignment 2 DIP

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Code

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# CS20B1125

# Assignment 2

import numpy as np

import matplotlib.pyplot as plt

import cv2

from skimage.util import random_noise

Lena = cv2.imread("Lena.png")

plt.imshow(Lena)

plt.show()

# Converting Lena to RGB

Lena_RGB = cv2.cvtColor(Lena, cv2.COLOR_BGR2RGB)

plt.imshow(Lena_RGB)

plt.show()

# Converting Lena to Gray

Lena_Gray = cv2.cvtColor(Lena_RGB, cv2.COLOR_BGR2GRAY)

plt.imshow(Lena_Gray, cmap="gray")

plt.show()

# Obtaining noisy images for n = 5

fiveImageList = []
```

```

n = 5

for i in range(0,n):

    noisy_img = random_noise(Lena_Gray,mode = 'gaussian',mean = 0 , var
= 1)
    noisy_img = np.array(255*noisy_img, dtype = 'uint8')
    fiveImageList.append(noisy_img)

# Plotting them
plt.figure(figsize = (20,10))

for i in range(n):
    plt.subplot(2,3,i+1)
    plt.imshow(fiveImageList[i],cmap="gray")
    title = "F"+str(i)
    plt.title(title)

# Calculating the average image for n = 5
avg_image = np.zeros((Lena_Gray.shape[0],Lena_Gray.shape[1]))

for i in range(0,n):
    img = fiveImageList[i]
    avg_image += img

avg_image /= n

# Displaying the average image for when n = 5
plt.imshow(avg_image,cmap="gray")

plt.show()

# Noisy images for when n = 10
ImageList = []

n = 10

for i in range(0,n):
    noisy_img = random_noise(Lena_Gray,mode = 'gaussian',mean = 0 , var
= 1)
    noisy_img = np.array(255*noisy_img, dtype = 'uint8')
    ImageList.append(noisy_img)

# Plotting them
plt.figure(figsize=(20,20))

```

```
for i in range(n):
    plt.subplot(4,3,i+1)
    plt.imshow(ImageList[i],cmap="gray")
    title = "F"+str(i)
    plt.title(title)

# Calculating average image for when n = 10
avg_image = np.zeros((Lena_Gray.shape[0],Lena_Gray.shape[1]))

for i in range(0,n):
    img = ImageList[i]
    avg_image += img

avg_image /= n

# Displaying it
plt.imshow(avg_image,cmap = "gray")

plt.show()

# Obtaining noisy images for when n = 30
ImageList = []

n = 30

for i in range(0,n):

    noisy_img = random_noise(Lena_Gray,mode = 'gaussian',mean = 0 , var = 1)

    noisy_img = np.array(255*noisy_img, dtype = 'uint8')

    ImageList.append(noisy_img)

# plotting the images
plt.figure(figsize=(30,30))

for i in range(n):

    plt.subplot(6,5,i+1)

    plt.imshow(ImageList[i],cmap="gray")

    title = "F"+str(i)
```

```

plt.title(title)

# Calculating the average image for n = 30
avg_image = np.zeros((Lena_Gray.shape[0],Lena_Gray.shape[1]))

for i in range(0,n):

    img = ImageList[i]
    avg_image += img

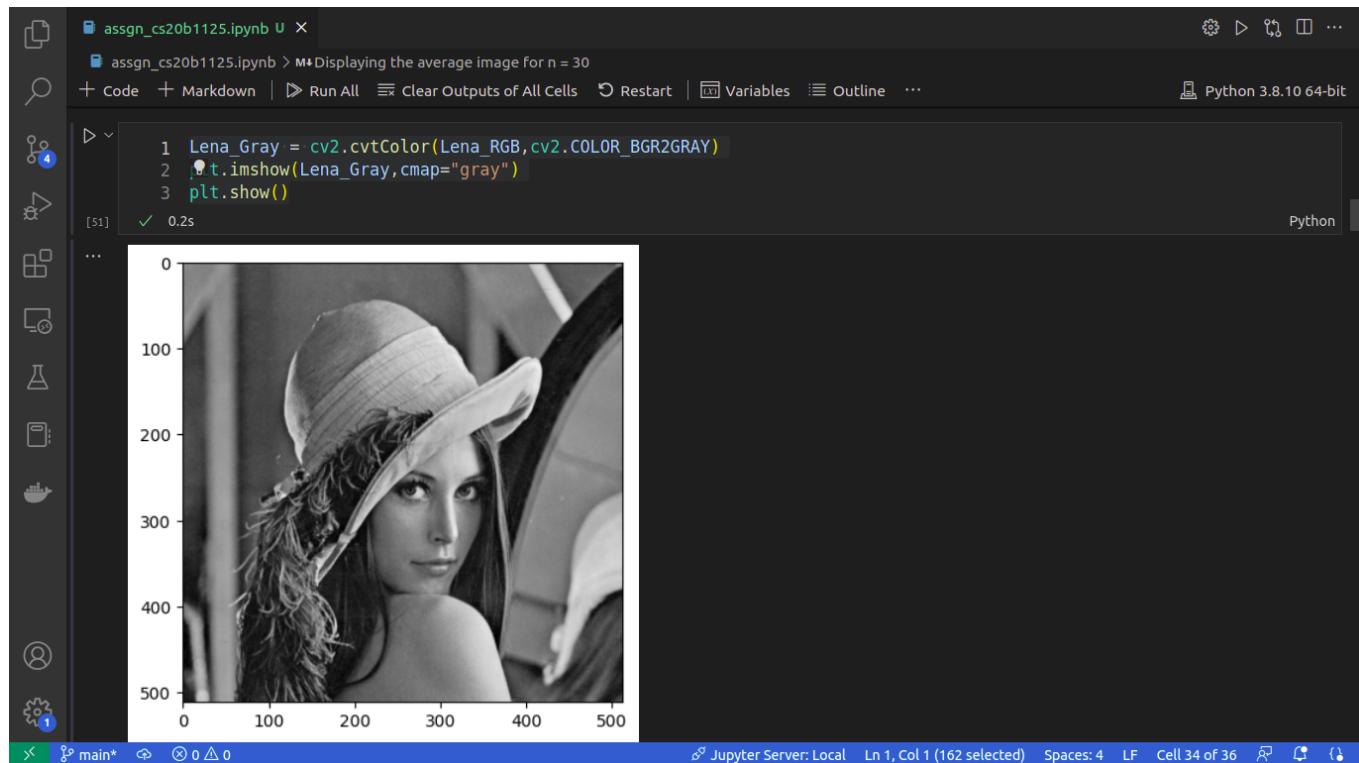
avg_image /= n

# Displaying the average image for n = 30
plt.imshow(avg_image,cmap = "gray")

plt.show()

```

Output:



Obtaining the noising images for n = 5

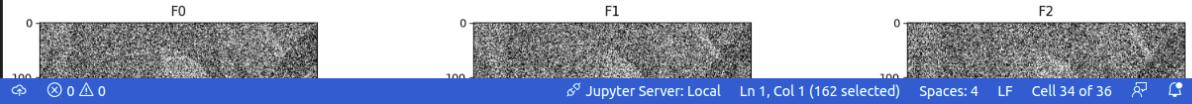
```
1 fiveImageList = []
2 n = 5
3 for i in range(0,n):
4     ... noisy_img = random_noise(Lena_Gray, mode = 'gaussian', mean = 0 , var = 1)
5     ... noisy_img = np.array(255*noisy_img, dtype = 'uint8')
6     ... fiveImageList.append(noisy_img)
```

[53] 0.8s Python

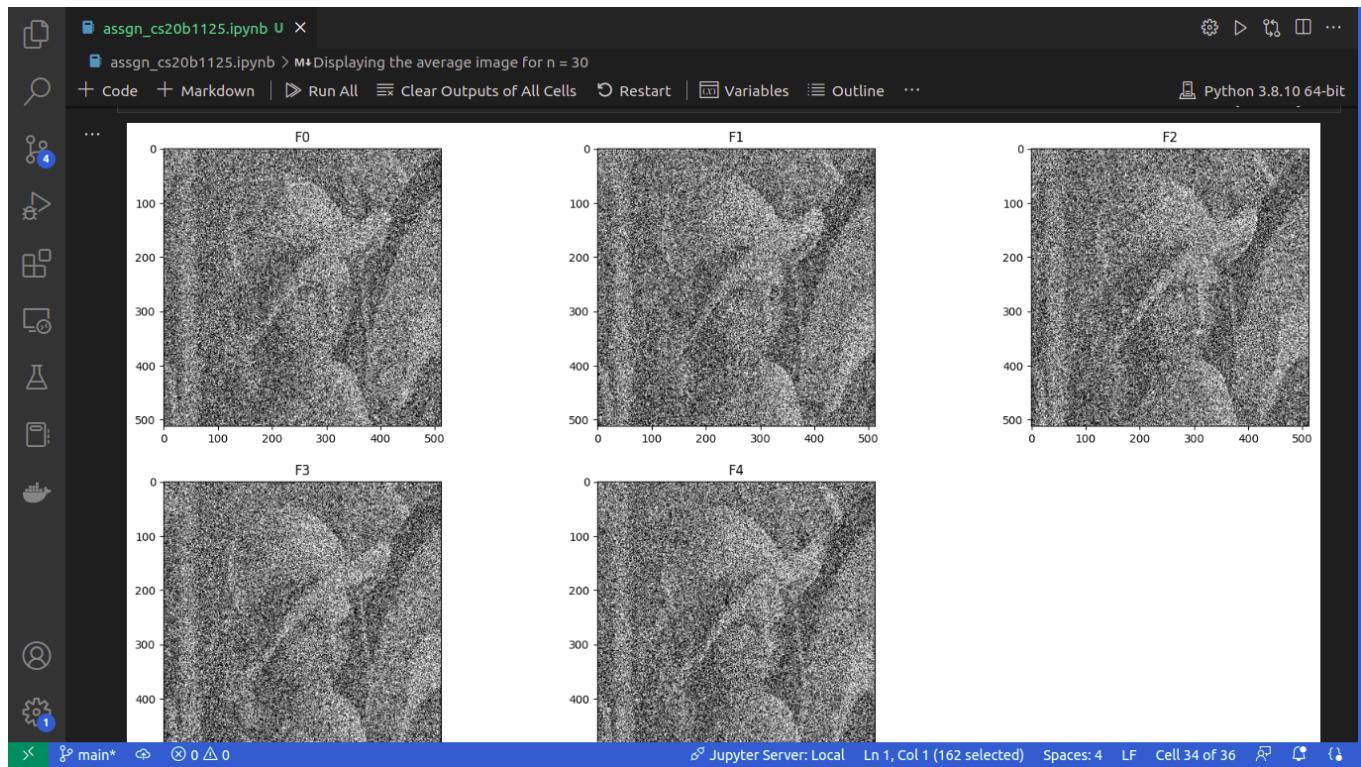
Displaying all the noisy images for when n = 5

```
1 plt.figure(figsize = (20,10))
2 for i in range(n):
3     ... plt.subplot(2,3,i+1)
4     ... plt.imshow(fiveImageList[i],cmap="gray")
5     ... title = "F"+str(i)
6     ... plt.title(title)
```

[57] 1.8s Python Python



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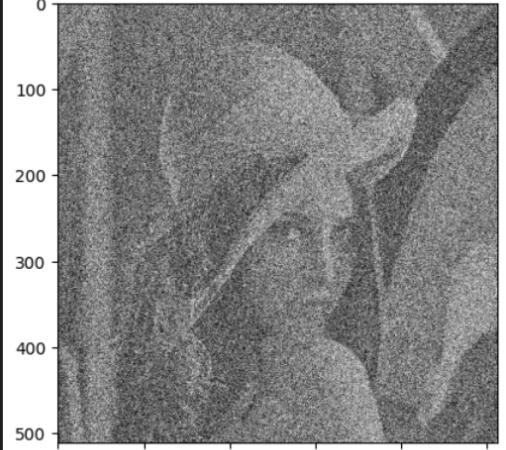


assgn_cs20b1125.ipynb

Displaying the average image when n = 5

```
1 plt.imshow(avg_image,cmap="gray")
2 plt.show()
```

[60] 0.3s Python



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assgn_cs20b1125.ipynb

Displaying the average image for n = 30

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+ Code + Markdown | Run All Clear Outputs of All Cells Restart | Variables Outline ... Python 3.8.10 64-bit
```

Obtaining noising images when n = 10

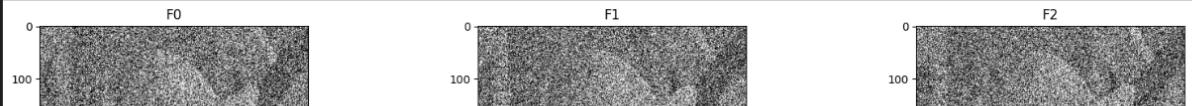
```
1 ImageList = []
2 n = 10
3 for i in range(0,n):
4     noisy_img = random_noise(Lena_Gray,mode = 'gaussian',mean = 0 , var = 1)
5     noisy_img = np.array(255*noisy_img, dtype = 'uint8')
6     ImageList.append(noisy_img)
```

[62] 0.3s Python

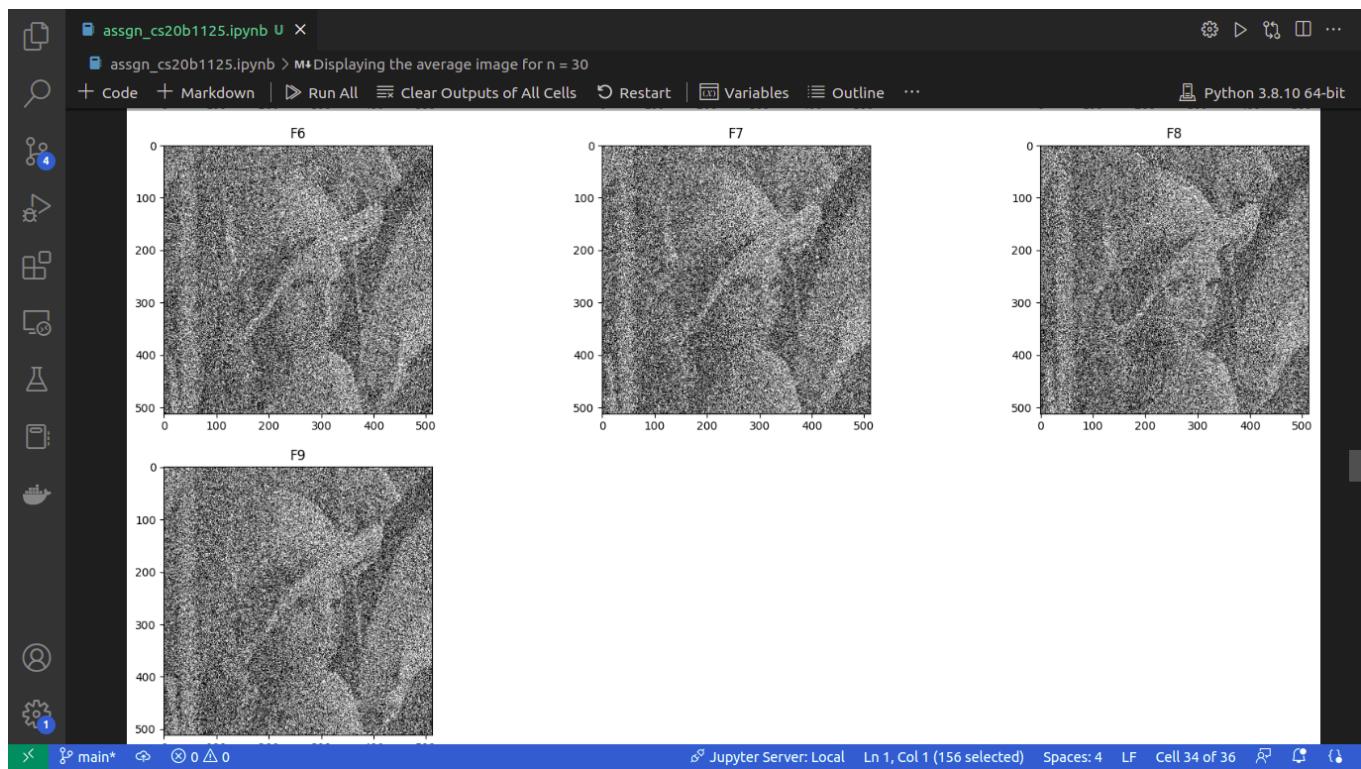
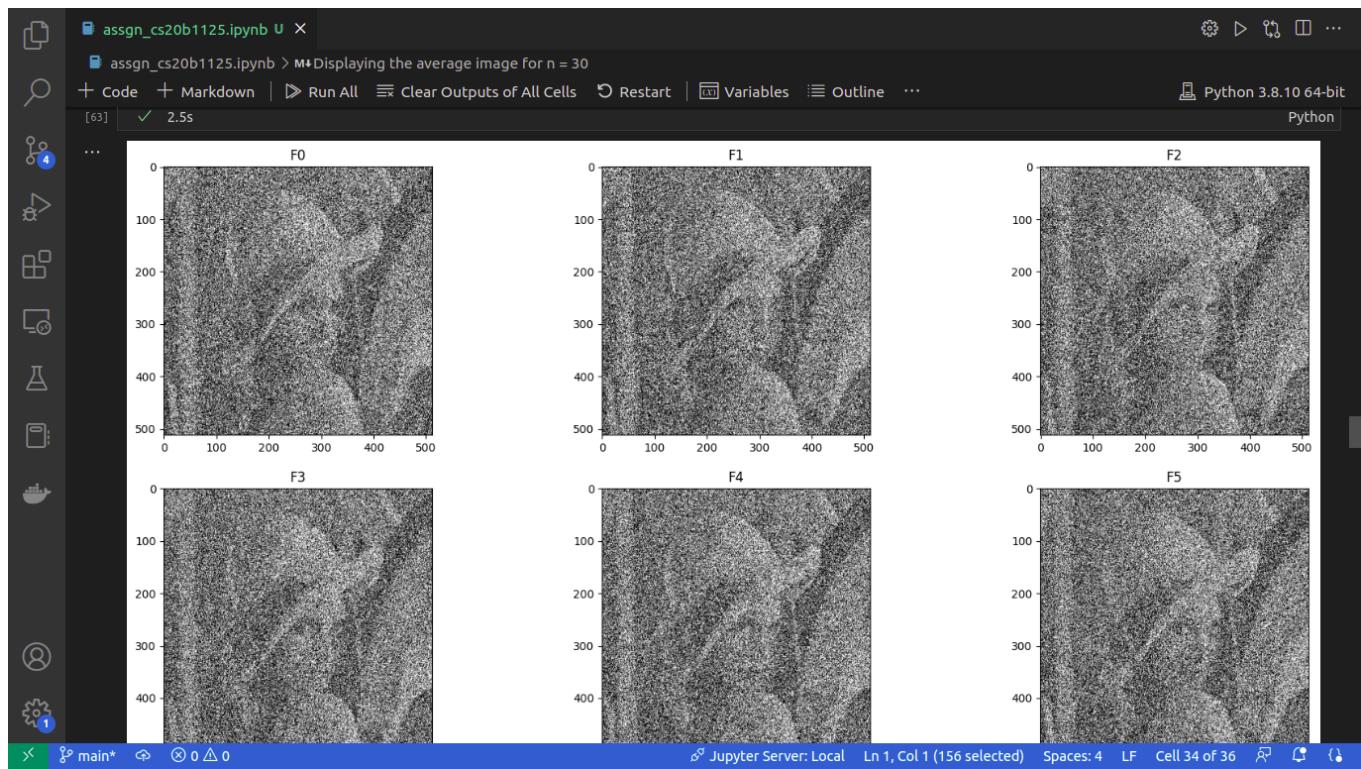
Displaying the noisy images

```
1 plt.figure(figsize=(20,20))
2 for i in range(n):
3     plt.subplot(4,3,i+1)
4     plt.imshow(ImageList[i],cmap="gray")
5     title = "F"+str(i)
6     plt.title(title)
```

[63] 2.5s Python



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assgn_cs20b1125.ipynb

Displaying the average image for n = 10

```
1 plt.imshow(avg_image,cmap = "gray")
2 plt.show()
```

0.3s

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assgn_cs20b1125.ipynb

Displaying the average image for n = 30

```
1 ImageList = []
2 n = 30
3 for i in range(0,n):
4     noisy_img = random_noise(Lena_Gray,mode = 'gaussian',mean = 0 , var = 1)
5     noisy_img = np.array(255*noisy_img, dtype = 'uint8')
6     ImageList.append(noisy_img)
```

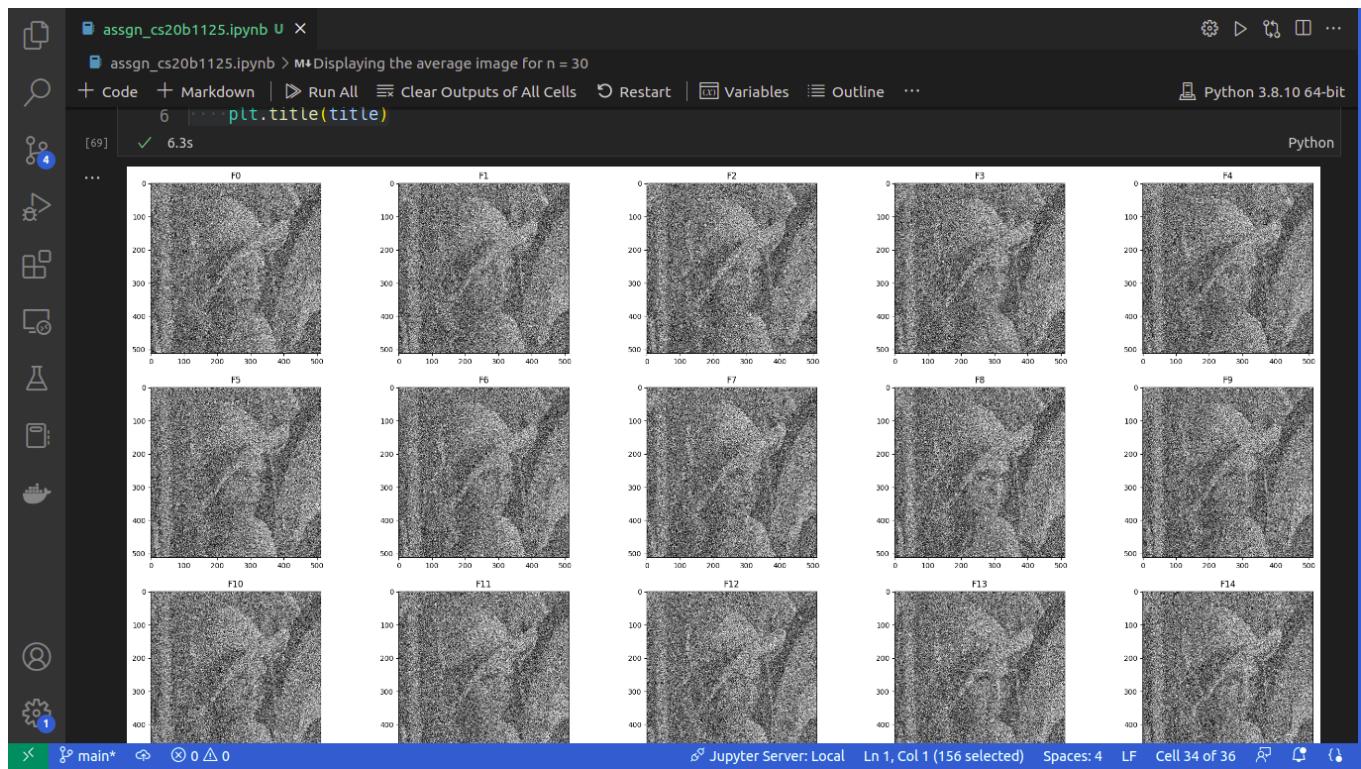
0.5s

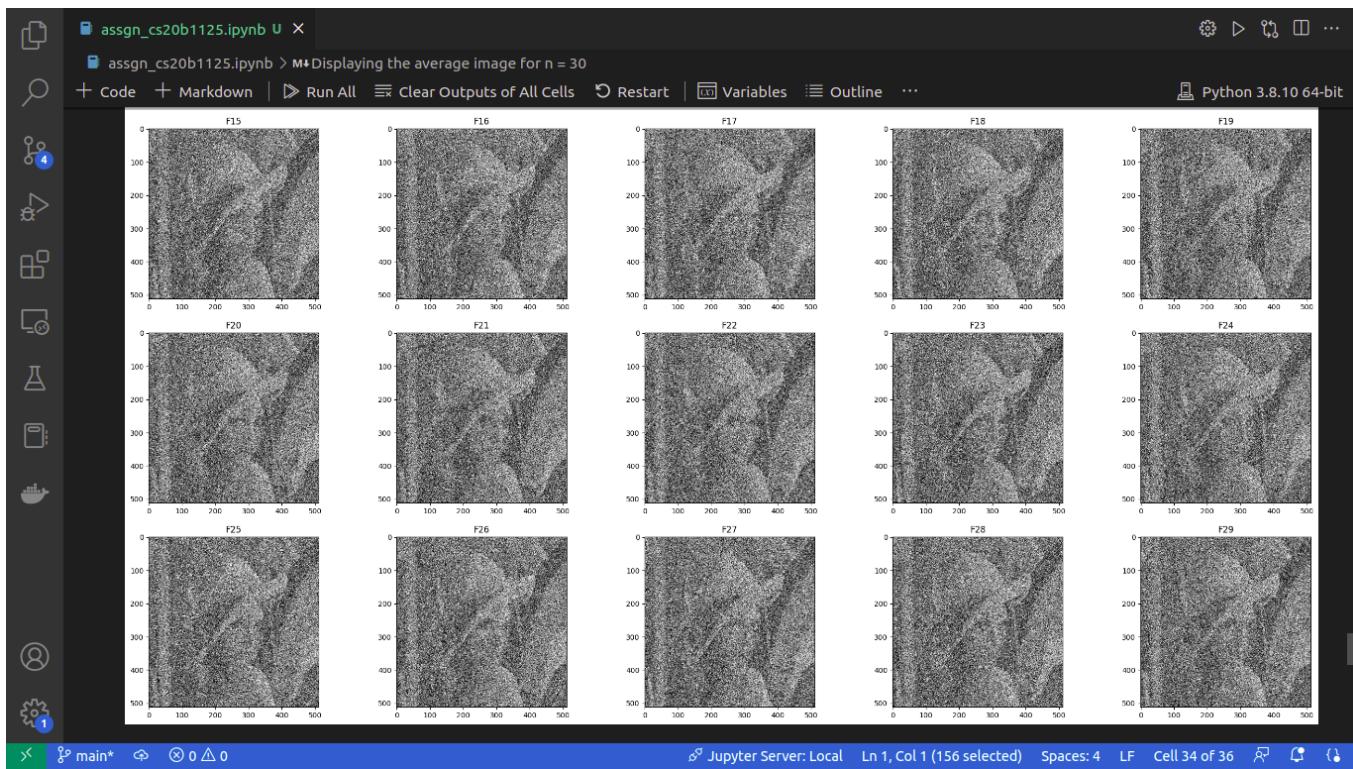
Obtaining noisy images for n = 30

```
1 plt.figure(figsize=(30,30))
2 for i in range(n):
3     plt.subplot(6,5,i+1)
4     plt.imshow(ImageList[i],cmap="gray")
5     title = "F"+str(i)
6     plt.title(title)
```

6.3s

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Displaying the average image for n = 30

```
1 plt.imshow(avg_image,cmap = "gray")
2 plt.show()
```

[46] 0.2s Python