

Assignment-1

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Write a code (either in Python or MATLAB) to create a checkerboard (or chessboard). Also, introduce the line drop error vertically and diagonally in two separate images at a constant interval of 15 columns.

```
In [1]: import numpy as np
import matplotlib.pyplot as plt
import cv2
```

Initialization:

```
In [2]: img_size = int(input('Enter the size of checkers board:'))
gap = int(input('\nEnter banding gap:'))
Img_array = np.zeros((img_size,img_size))
```

Enter the size of checkers board:40

Enter banding gap:15

```
In [3]: img = Img_array.copy()
for i in range(img_size):
    for j in range(img_size):
        if (i+j)%2 != 0:
            img[i][j] = 255
img_o = img.reshape((img_size,img_size)).astype('uint8')
cv2.imwrite('Checker_board.jpg',img_o)
```

Out[3]: True

Introducing banding in image:

```
In [4]: img_v = img.copy()
c = 0
for i in range(img_size):
    for j in range(img_size):
        if c == 0:
            img_v[i][j]=255
            c = gap
        else:
            c -= 1
    c = 0

img_vb = img_v.reshape((img_size,img_size)).astype('uint8')
cv2.imwrite('Verticle_linedrop_error.jpg',img_vb)
```

Out[4]: True

```
In [5]: img_d = img.copy()
c = gap
a = 1
for i in range(img_size):
    for j in range(img_size):
        if c == gap:
            img_d[i][j]=255
            c = 0
        else:
            c += 1
    c = gap - a
    if(a == gap):
        a = 0
    else:
        a += 1

img_db = img_d.reshape((img_size,img_size)).astype('uint8')
cv2.imwrite('Daigonal_linedrop_error.jpg',img_db)
```

Out[5]: True

Visualizing:

```
In [6]: plt.figure(figsize=(15, 15))

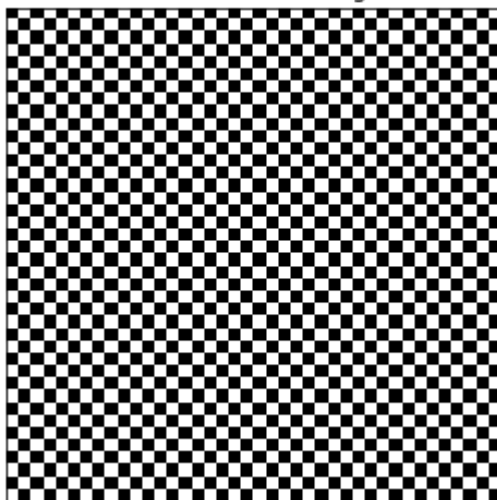
plt.subplot(131)
plt.title('Checker board image')
plt.imshow(img_o, cmap='gray')
plt.xticks([])
plt.yticks([])

plt.subplot(132)
plt.title('Vertical line drop error image')
plt.imshow(img_vb, cmap='gray')
plt.xticks([])
plt.yticks([])

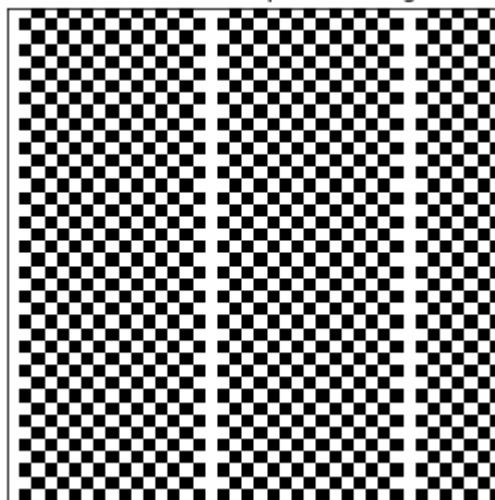
plt.subplot(133)
plt.title('Diagonal line drop error image')
plt.imshow(img_db, cmap='gray')
plt.xticks([])
plt.yticks([])

plt.savefig('Grid.png')
plt.show()
```

Checker board image



Vertical line drop error image



Diagonal line drop error image

