Import Libary

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

Initialize Value

```
In [2]:   r = np.random.randint(0,255,size = (10,10))
          path = "/media/rifat/STUDY/4-1/LAB/Image_Processing/image/paddy.jpeg"
          img = plt.imread(path)
          m,n,cn = img.shape

          r = cv.cvtColor(img, cv.COLOR_RGB2GRAY)

          T1 = 100
          T2 = 150
          c = 2
          p = 5
          epsilon = np.finfo(float).eps
          print(r)
```
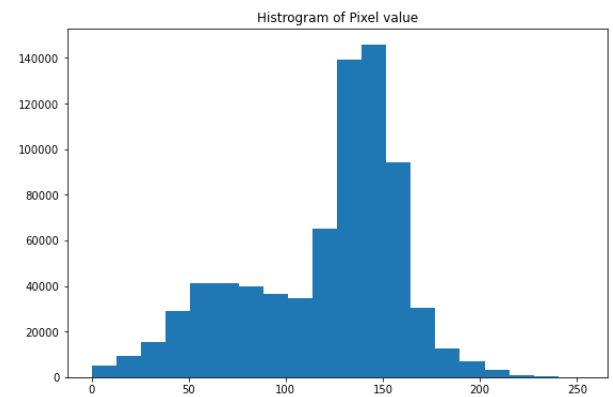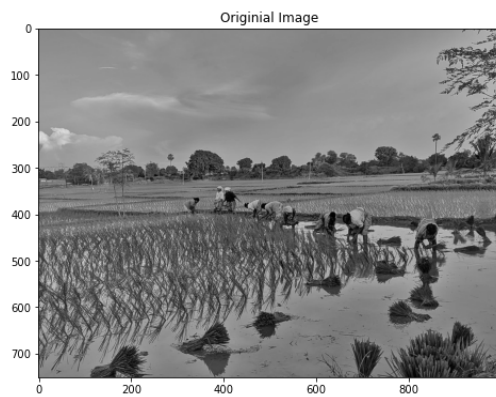
```
[[135 135 135 ... 149 178  98]
 [135 135 135 ... 166 198 195]
 [135 135 135 ... 200 187 193]
 ...
 [131 131 131 ... 106 102  98]
 [131 131 131 ... 105 115 103]
 [130 130 130 ... 103 111  83]]
```

Originial image with Histogram

In [3]:
```python
fig, ax = plt.subplots(1,2, figsize=(20,6))
plt.subplot(1,2,1)
plt.title("Originial Image")
plt.imshow(r,cmap = 'gray')
d = r.flatten()
plt.subplot(1,2,2)
plt.title("Histrogram of Pixel value")
plt.hist(d,bins = 20)


plt.show()
```


s = 100, if r >= T1 and r <= T2; otherwise s = 10.
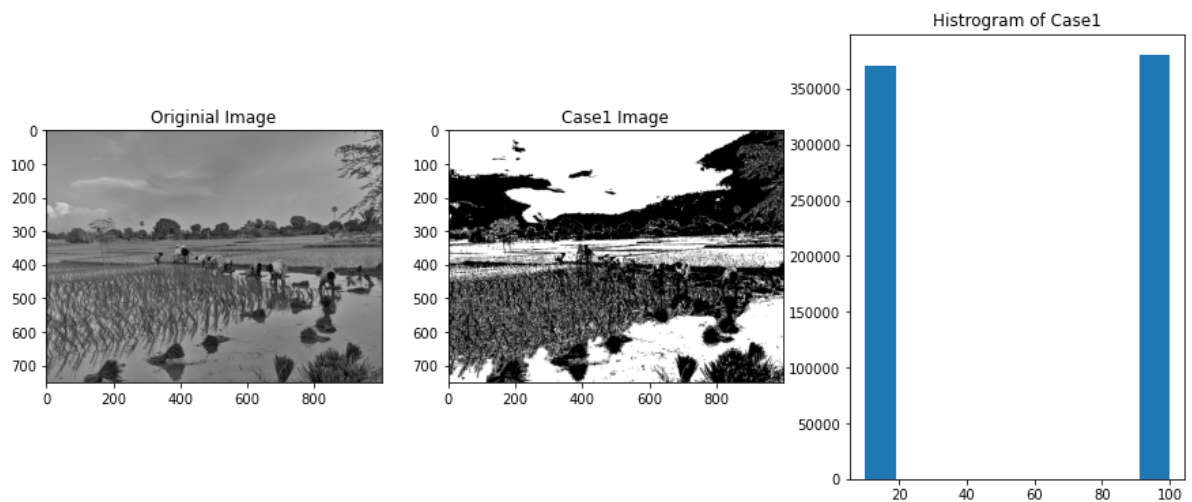
In [4]:
```python
s = []
sz = d.size

for i in range (sz):
    if d[i]>=T1 and d[i]<= T2:
        s.append(100)
    else:
        s.append(10)
```

```
In [5]: fig, ax = plt.subplots(1,3, figsize=(15,6))
        s = np.reshape(s,(m,n))
        plt.subplot(1,3,1)
        plt.title("Originial Image")
        plt.imshow(r,cmap = 'gray')

        plt.subplot(1,3,2)
        plt.title("Case1 Image")
        plt.imshow(s,cmap = 'gray')
        s = s.flatten()
        plt.subplot(1,3,3)
        plt.title("Histrogram of Case1")
        plt.hist(s)


        plt.show()
```
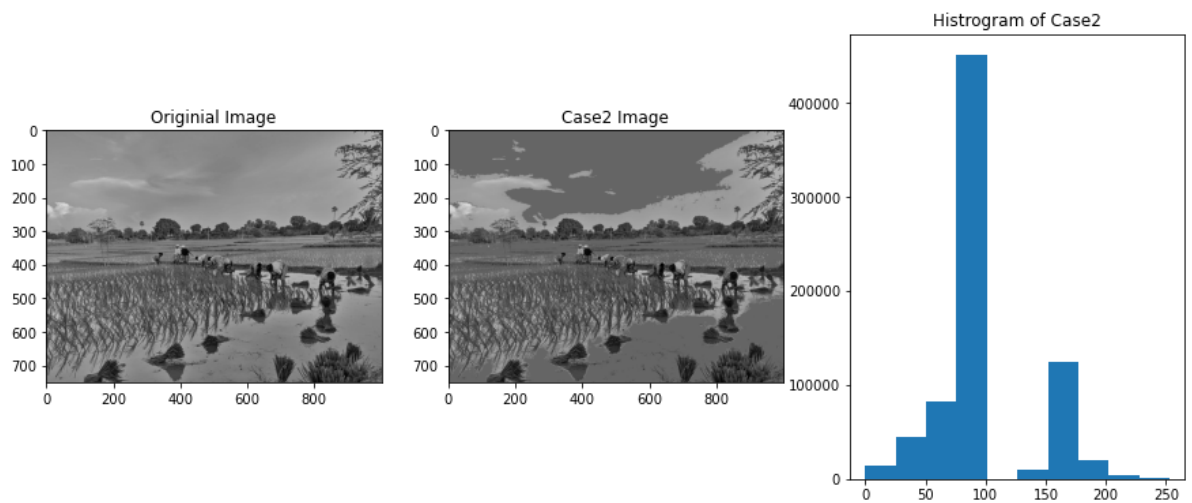

s = 100, if r >= T1 and r <= T2; otherwise s = r.

```
In [6]: s = []
        for i in range (sz):
            if d[i]>=T1 and d[i]<= T2:
                s.append(100)
            else:
                s.append(d[i])
```

In [7]:
```python
fig, ax = plt.subplots(1,3, figsize=(15,6))
s = np.reshape(s,(m,n))
plt.subplot(1,3,1)
plt.title("Originial Image")
plt.imshow(r,cmap = 'gray')

plt.subplot(1,3,2)
plt.title("Case2 Image")
plt.imshow(s,cmap = 'gray')
s = s.flatten()
plt.subplot(1,3,3)
plt.title("Histrogram of Case2")
plt.hist(s)

plt.show()
```


s = c log(1 + r) and s = c (s + epsilon) ^ p

In [8]:
```python
s = []
s1 = []
for i in range (sz):
    x = c * np.log(1+d[i])
    s.append(x)
    x = c * pow(( d[i] + epsilon ),p)
    s1.append(x)
```

In [10]:
```python
# plt.subplots(2,2, figsize=(8,8))
plt.figure(figsize = (10,10))
plt.subplot(2,2,2)
plt.title("Histrogram of Case3")
plt.hist(s)

s = np.reshape(s,(m,n))
plt.subplot(2,2,1)
plt.title("Case3 Image")
plt.imshow(s,cmap = 'gray')

plt.subplot(2,2,4)
plt.title("Histrogram of Case4")
plt.hist(s1)

s1 = np.reshape(s1,(m,n))
plt.subplot(2,2,3)
plt.title("Case4 Image")
plt.imshow(s1,cmap = 'gray')

plt.show()
```
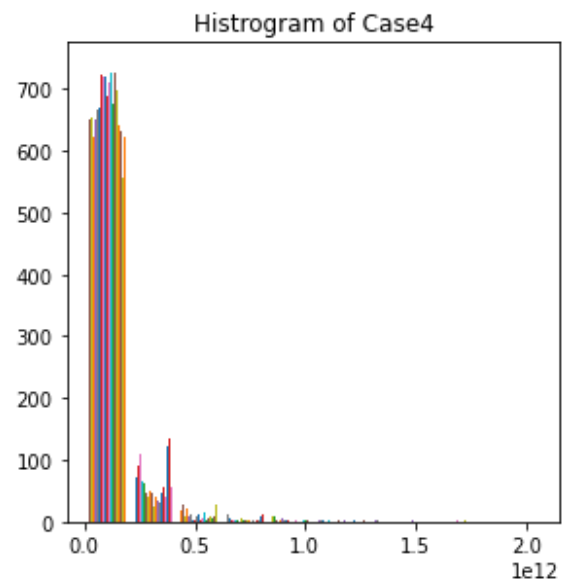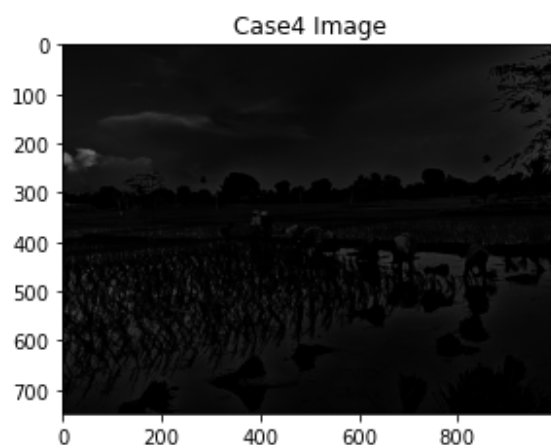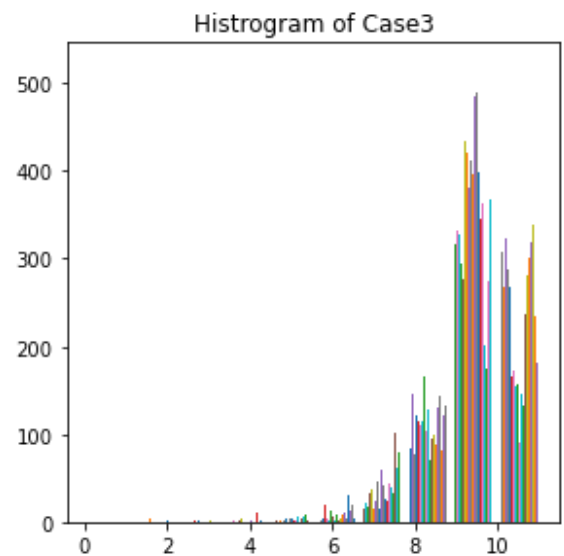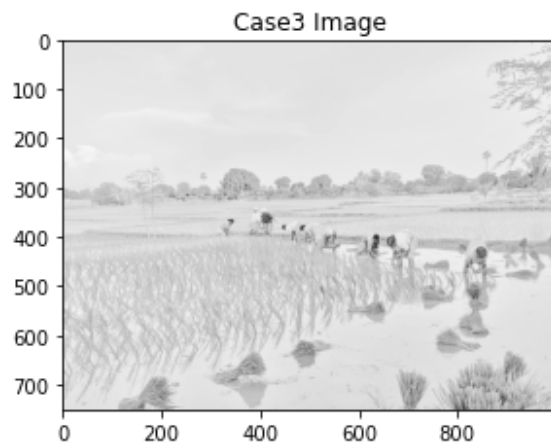

Case3 Image

Histrogram of Case3

Case4 Image

Histrogram of Case4

In [ ]: