Import Libary

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

Initialize Value

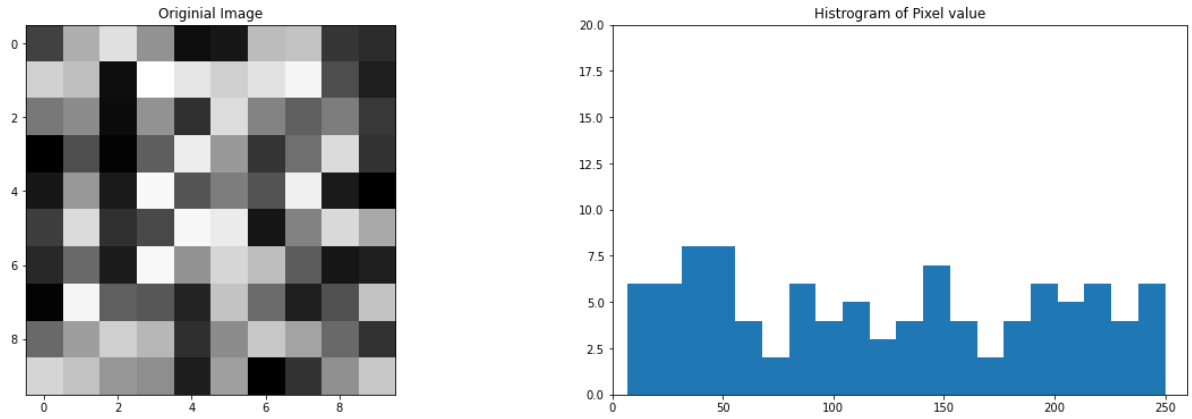
In [2]:
```
r = np.random.randint(0,255,size = (10,10))
T1 = 100
T2 = 150
c = 2
p = 5
epsilon = np.finfo(float).eps
print(r)
```

```
[[ 69 173 220 146  21  29 186 192  59  50]
 [206 189  21 250 226 204 222 240  81  36]
 [121 140  18 146  54 216 133  98 126  62]
 [  7  82  10  97 232 153  58 113 215  55]
 [ 29 152  32 244  87 126  86 235  32   7]
 [ 66 215  54  77 242 231  27 131 214 168]
 [ 46 107  34 243 146 211 188  95  28  37]
 [ 10 240  98  90  43 193 109  36  85 192]
 [107 157 204 181  52 140 196 163 108  55]
 [210 192 150 142  35 158   7  55 144 196]]
```

Originial image with Histogram

In [3]:
```
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.axis([0, 260, 0, 20])

plt.show()
```



s = 100, if r >= T1 and r <= T2; otherwise s = 10.

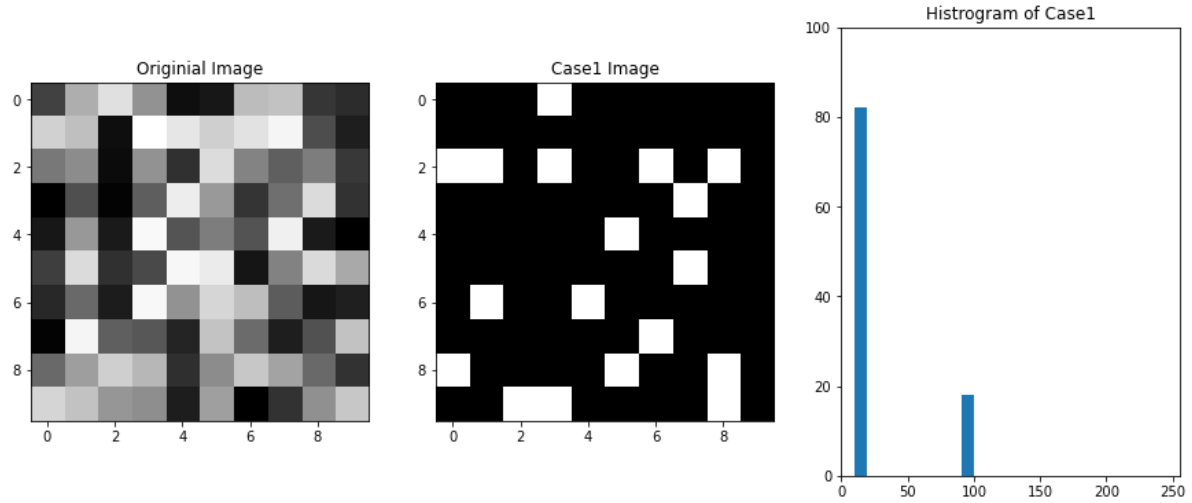
In [4]:
```
s = []
for i in range (100):
    if d[i]>=T1 and d[i]<= T2:
        s.append(100)
    else:
        s.append(10)
print(s)
```

```
[10, 10, 10, 100, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,
10, 10, 10, 100, 100, 10, 100, 10, 10, 100, 10, 100, 10, 10, 10, 10, 1
0, 10, 10, 10, 100, 10, 10, 10, 10, 10, 10, 10, 100, 10, 10, 10, 10, 1
0, 10, 10, 10, 10, 10, 10, 100, 10, 10, 10, 100, 10, 10, 100, 10, 10,
10, 10, 10, 10, 10, 10, 10, 10, 10, 100, 10, 10, 10, 100, 10, 10, 10,
10, 100, 10, 10, 100, 10, 10, 10, 100, 100, 10, 10, 10, 10, 100, 10]
```

In [5]:
```
fig, ax = plt.subplots(1,3, figsize=(15,6))
s = np.reshape(s,(10,10))
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.axis([0, 255, 0, 100])

plt.show()
```



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

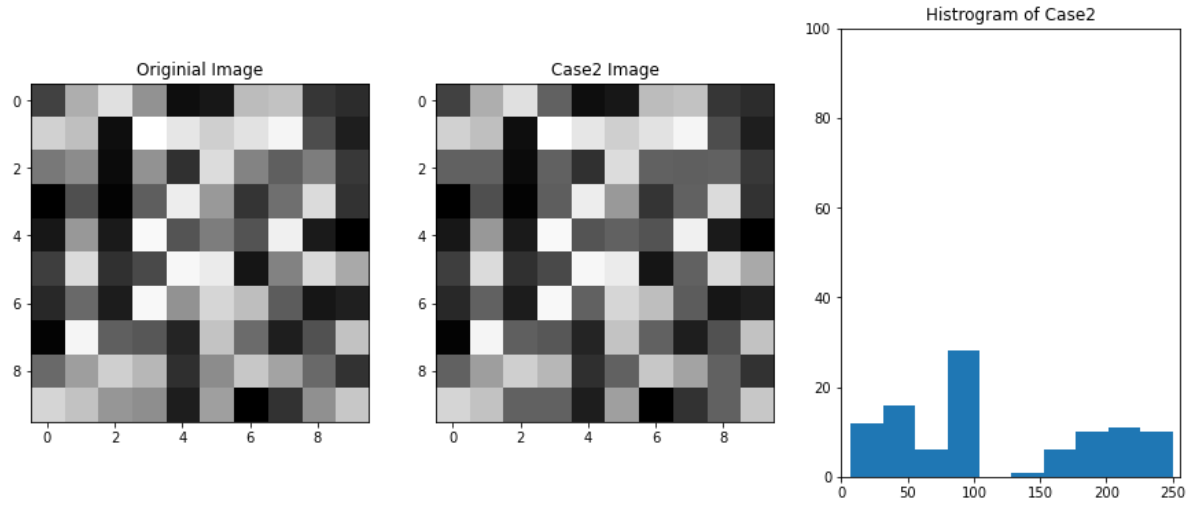
In [6]:
```
s = []
for i in range (100):
    if d[i]>=T1 and d[i]<= T2:
        s.append(100)
    else:
        s.append(d[i])
print(s)
```

```
[69, 173, 220, 100, 21, 29, 186, 192, 59, 50, 206, 189, 21, 250, 226,
204, 222, 240, 81, 36, 100, 100, 18, 100, 54, 216, 100, 98, 100, 62,
7, 82, 10, 97, 232, 153, 58, 100, 215, 55, 29, 152, 32, 244, 87, 100,
86, 235, 32, 7, 66, 215, 54, 77, 242, 231, 27, 100, 214, 168, 46, 100,
34, 243, 100, 211, 188, 95, 28, 37, 10, 240, 98, 90, 43, 193, 100, 36,
85, 192, 100, 157, 204, 181, 52, 100, 196, 163, 100, 55, 210, 192, 10
0, 100, 35, 158, 7, 55, 100, 196]
```

In [7]:
```
fig, ax = plt.subplots(1,3, figsize=(15,6))
s = np.reshape(s,(10,10))
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.axis([0, 255, 0, 100])

plt.show()
```



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

In [11]:
```
s = []
s1 = []
for i in range (100):
    x = c * np.log(1+d[i])
    s.append(x)
    x = c * pow(( d[i] + epsilon ),p)
    s1.append(x)
```

In [18]:
```
# plt.subplots(2,2, figsize=(8,8))
plt.subplot(2,2,2)
plt.title("Histrogram of Case3")
plt.hist(s)

s = np.reshape(s,(10,10))
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,(10,10))
plt.subplot(2,2,3)
plt.title("Case4 Image")
plt.imshow(s1,cmap = 'gray')

plt.show()
```