# Experiment 2 : Histogram Equalisation

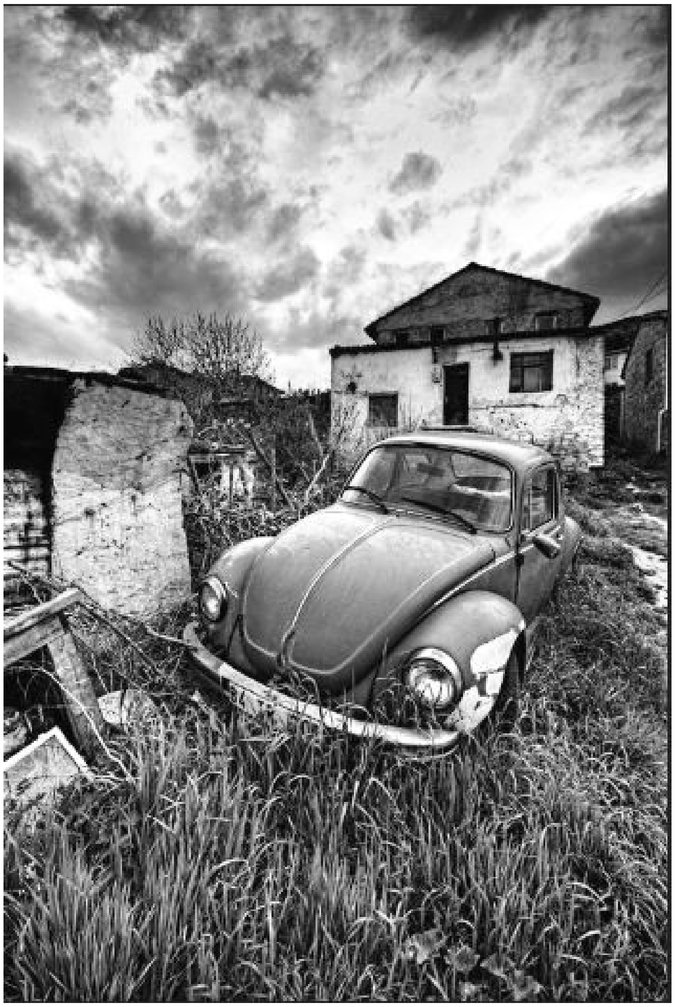
Aim : To perform histogram equalisation

Code :

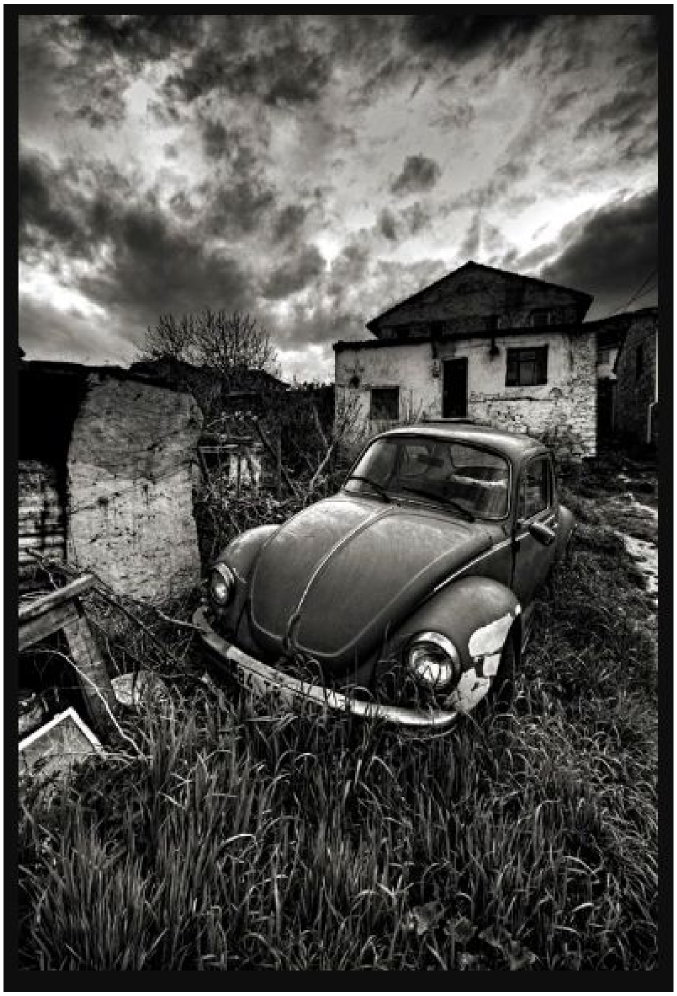
```
from PIL import Image
import matplotlib.pyplot as plt

class histogram_Equalization:
 def __init__(self,wd,ht,im):

   self.w = wd
   self.h = ht
   self.img = im
   self.new_img = Image.new("RGB",(wd,ht),"white")
   self.pixels = self.new_img.load()
   self.new_img = Image.new("RGB",(wd,ht),"white")
   self.pixels = self.new_img.load()

 def plotly(self,lst,n):
   x = [i for i in range(256)]
   plt.plot(x,lst)
   plt.xlabel('Grey-Level')
   plt.ylabel('No. of Pixels')
   if n == 1:
     plt.title("Original Image")
   else:
     plt.title("Equalised Image")
   plt.show()

 def generate(self,sk):

   for wd in range(self.w):
     for ht in range(self.h):
       pix = self.img.getpixel((wd,ht))
       r = pix[0]
       self.pixels[wd,ht] = (round(sk[r]),round(sk[r]),round(sk[r]))
   self.new_img.show()
 def equalise(self):

   gLevel = [0]*256
   pdf = [0]*256
   cf = [0]*256
   sk = [0]*256
   new_gLevel = [0]*256
   for wd in range(self.w):
     for ht in range(self.h):
       pix = self.img.getpixel((wd,ht))
       r = pix[0]
       g = pix[1]
       b = pix[2]
       x = (r+b+g)/3
       # x = r
       gLevel[round(x)] = gLevel[round(x)] + 1
   self.plotly(gLevel,1)
   nk = self.w*self.h
   for i in range(len(gLevel)):
     pdf[i] = gLevel[i]/nk
     if i >= 1:
       cf[i] = pdf[i]+cf[i-1]
     else:
       cf[i] = pdf[0]
     sk[i] = 255*cf[i]
     new_gLevel[round(sk[i])] += gLevel[i]
   print(new_gLevel)
   self.plotly(new_gLevel,2)
   self.generate(sk)


def main():
 img = Image.open("img2.jpg")
 pixel = img.getpixel((50,50))
```

```
print(pixel)
w,h = img.size
histe = histogram_Equalization(w,h,img)
histe.equalise()
if __name__=='__main__':
main()
```

Output :



Original Image



Equalised Image

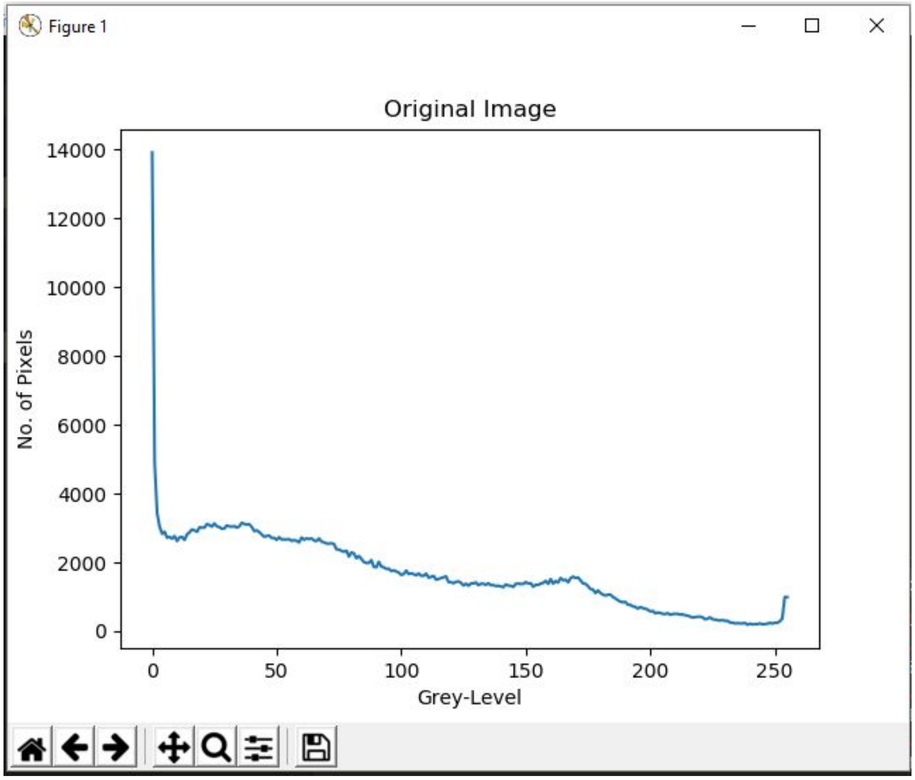


Figure 1
Original Image
No. of Pixels
14000
12000
10000
8000
6000
4000
2000
0
0
50
100
150
200
250
Grey-Level

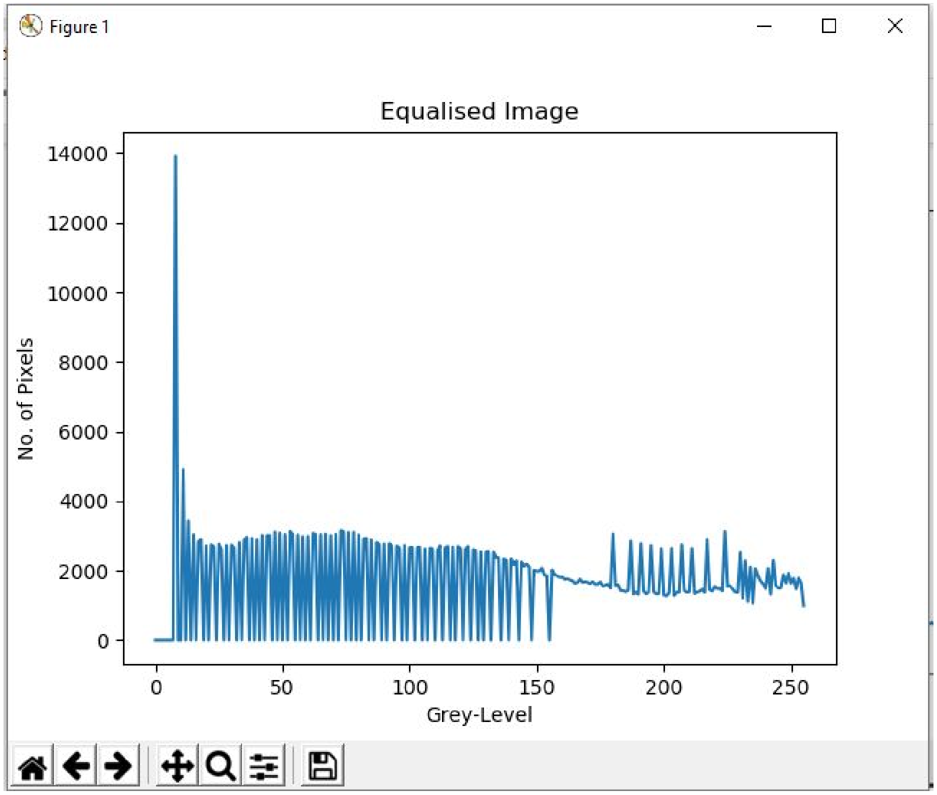


Figure 1
Equalised Image
No. of Pixels
14000
12000
10000
8000
6000
4000
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0
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50
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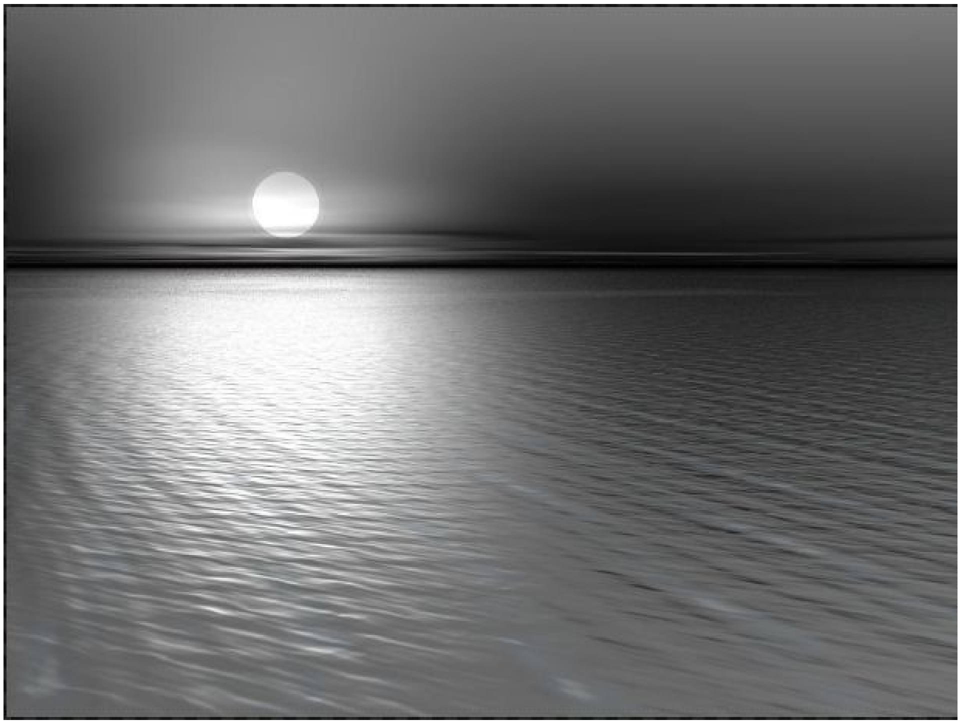
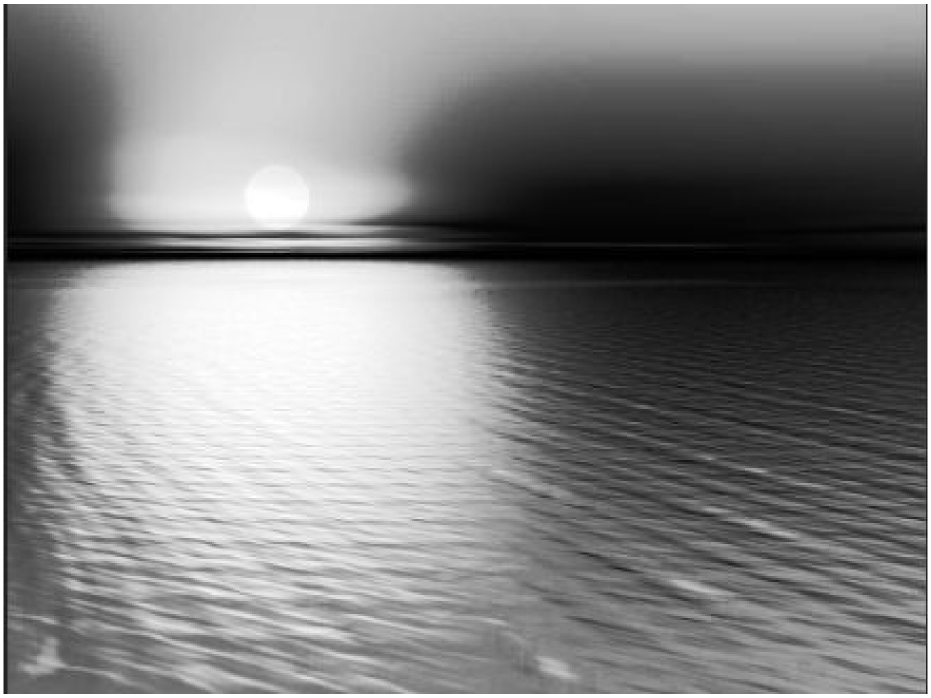
200
250
Grey-Level



Original Image



Equalised Image