Assignment 2

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Algorithm(Q1a)

- Entered color image as input
- Created a column matrix (freq) of zeros of size 256 X 1 that stores the no of pixels of a particular level
- Used a for loop to check whether a pixel has a intensity level p (0 ¡p¡ 255) and if the condition satisfies incremented the value freq(p+1) . The final matrix has total no of pixels corresponding to all intensity values
- created a function Bin calculation that return bin location and bin count
- Created a bin matrix of size n x 4 where n is the no of bins in histogram.
- First column stores the start position of each bin (bi,1) and second column stores the end position of each bin (bi,2) and the (bi,4) stores the no of pixels present in the range [(bi,1) , (b,2)]
- Start position of bin 1 is taken as 0
- Calculated the positions of every bin using the relation
- b(i,2) = b(i,1) + n2 b(i+1,1) = b(i,2) +1 Where n2 is no of intensity levels in each bin n2=256/n . Calculated bin count [b(i,3)] from the column matrix freq b(i,3) = freq(b(i,1)) + — ——— —+ freq(b(i,2))
- Taken average of start and end position of bin as bin location [b(i,1) + b(i,2)]/2 = bin location = b(i,4)
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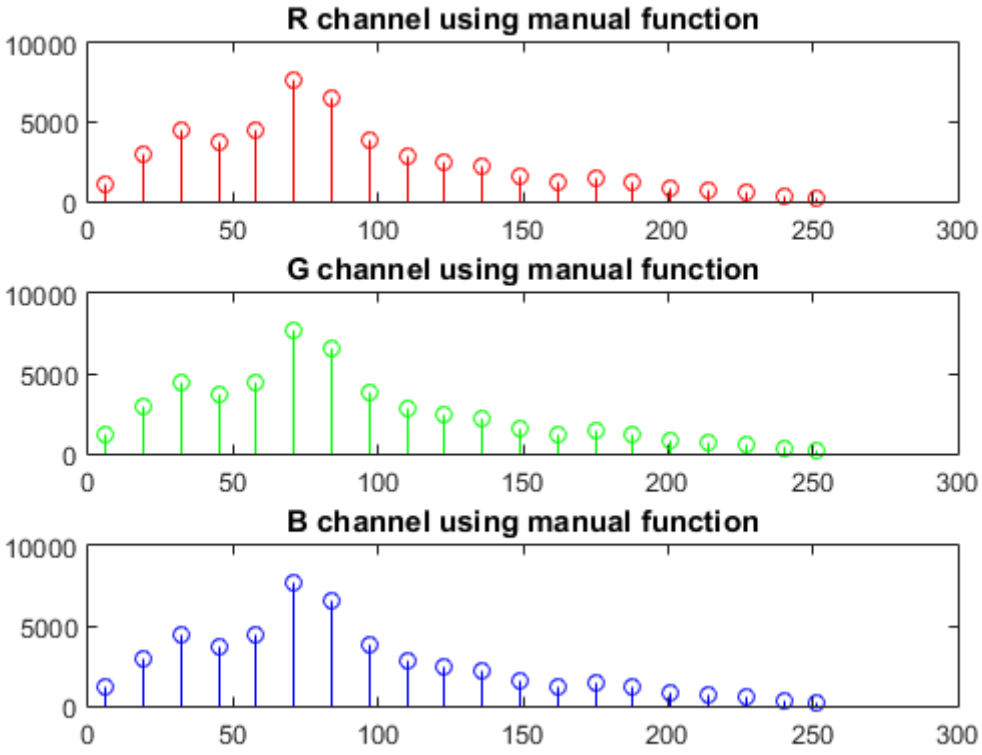
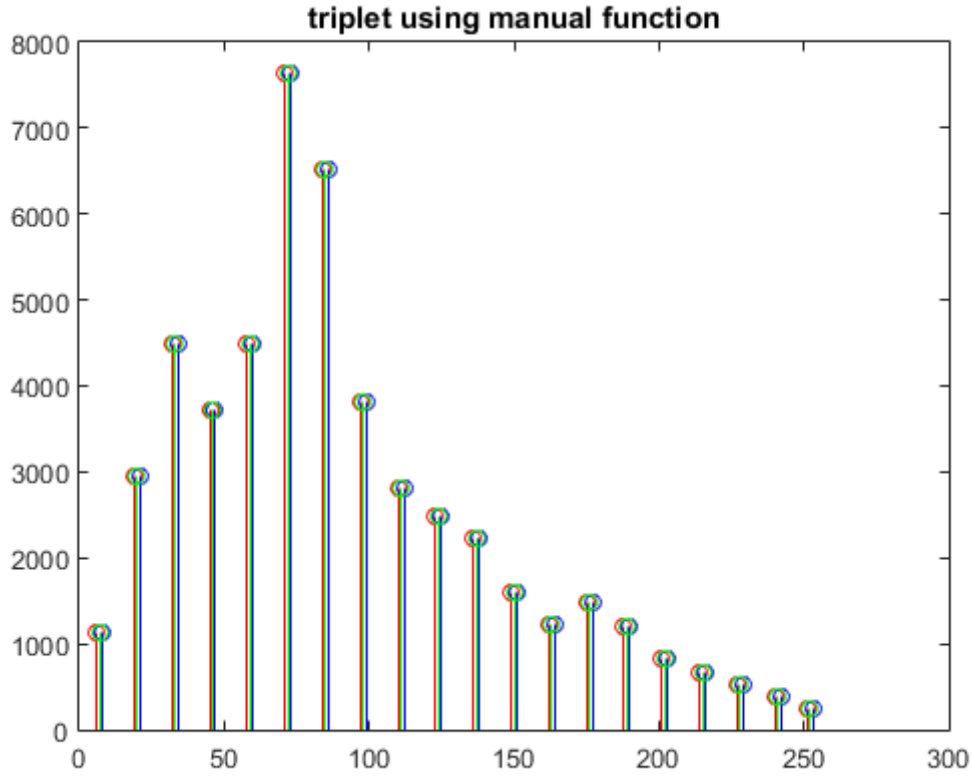
- Used stem function to plot the [b(i,4),b(i,3)] that gives the desired histogram with n bins
- In the same way did for three channel(R ,G ,B)

Input:

Output:

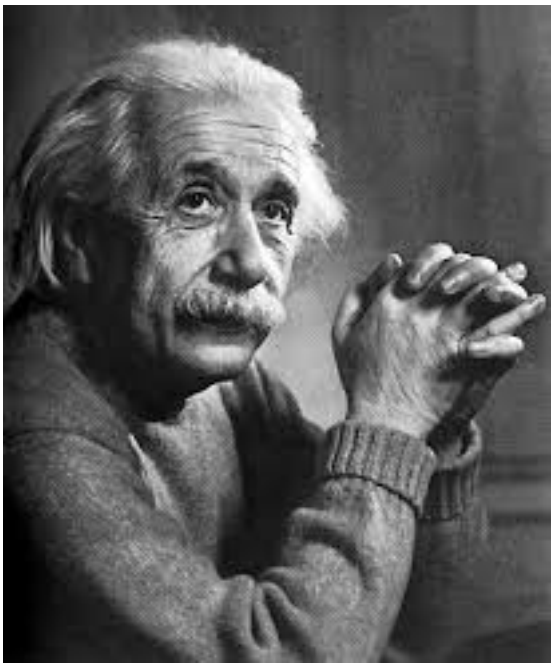

R channel using manual function
10000
5000
0
0
50
100
150
200
250
300
G channel using manual function
10000
5000
0
0
50
100
150
200
250
300
B channel using manual function
10000
5000
0
0
50
100
150
200
250
300


triplet using manual function
8000
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250
300

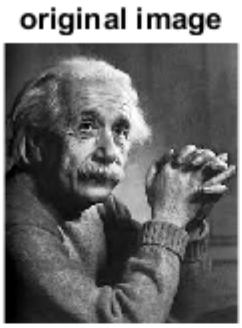
Algorithm(Q1b)

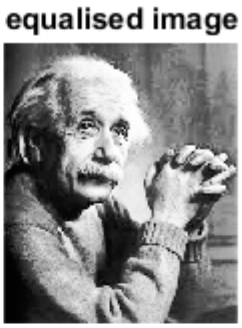
- Created a column matrix (fre) of zeros of size 256 X 1 that stores the no of pixels of a particular level
- Used a for loop to check whether a pixel has a intensity level p (0 ¡p¡ 255) and if the condition satisfies incremented the value fre(p+1)
- The final matrix has total no of pixels corresponding to all intensity value.
- Normalized the matrix by multiplying 1/mn to the column matrix The obtained matrix contains probabilities of all intensity values P(I) where I is pixel intensity 0¡ I ¡ 255
- Used the below formula and rounded the obtained value to get the transformation
- s(i)=255 x[(p(1)+p(2)+ - —- —- – —+P(i)]
- Replaced every pixel of intensity of i with S(i) to obtain equalized image

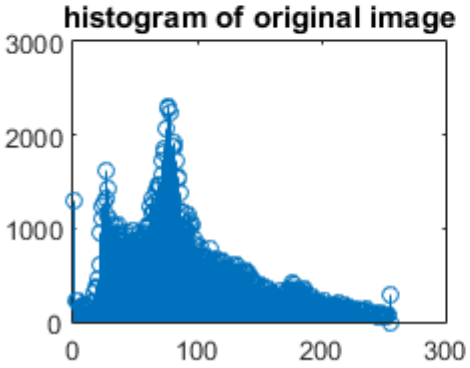
input:

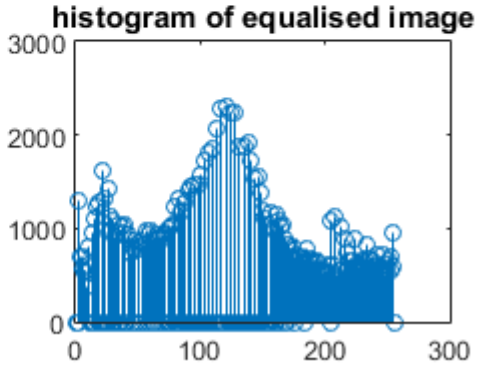


Output:





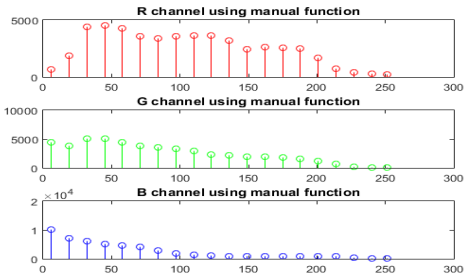


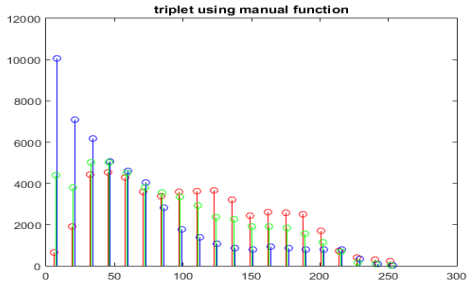


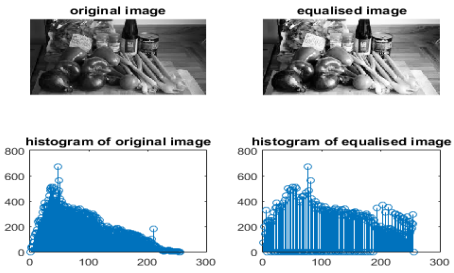
Observation(Q1c)

input:

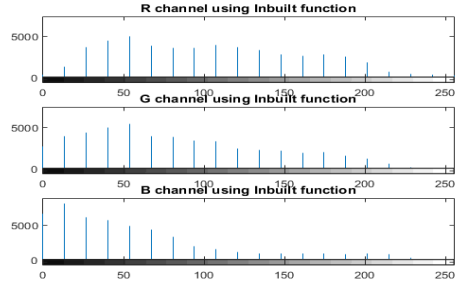
- first we called in built function to create histogram of an image

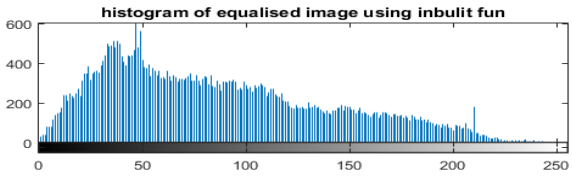






- then plotted histogram using in built function imhist and histeq





- time taken by manual function = 0.4348 sec
- time taken by inbuilt function = 0.7284 sec