



FACULTY OF SCIENCE UNIVERSITY OF PERADENIYA
DEPARTMENT OF STATISTICS AND COMPUTER SCIENCE
END SEMESTER EXAMINATION - SEMESTER I (2020/2021)
CS314 - IMAGE PROCESSING PRACTICAL (1 Credit)

Answer ALL Questions

Time Allowed: 2 Hours 30 Minutes

Open Book Examination

Create three separate python files S17XXXQ1.py, S17XXXQ2.py, S17XXXQ3.py, to answer the questions where S17XXX is your registration number.

1. [45 Marks]

Write a program to count the number of large and small complete versions of circles separately in the given image (Q1_Circles.jpg). Circle counts should be 17 and 34 for large and small sizes respectively. You should save the final output (Figure 1) as **circle_counts_final.png**. (Hint. You may use image slicing and consider the area of circles for counting purposes).

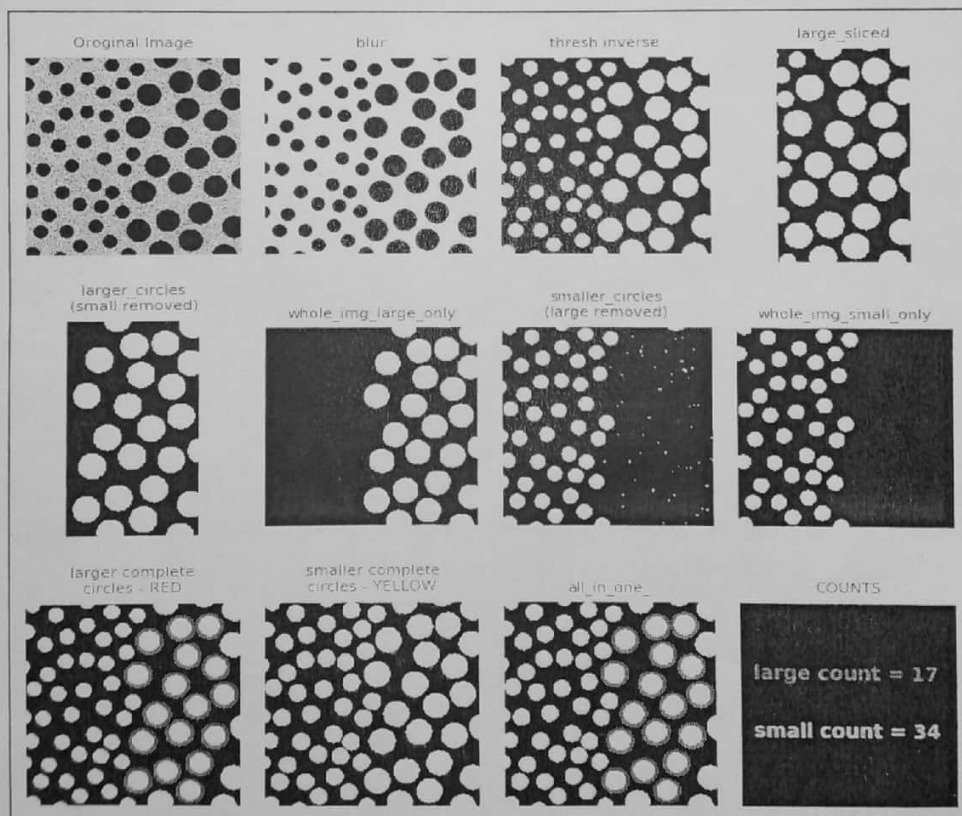


Figure 1: Expected Output of Question 01

2. [40 Marks]

Given **harbour.jpg** (Figure 2 (left)) is an image distorted with patterned noise. Use frequency domain techniques to remove the patterned noise to obtain an output similar to the one given in Figure 2 (right).

(Hint: you may use `cv2.line()` if required)

```
cv2.line(image, start_point, end_point, color, thickness)
```

- a) You should visualize the following results using a single figure (Use 2 by 2 figure style).
 - i) Original Image
 - ii) Shifted Magnitude Spectrum
 - iii) Created Mask
 - iv) Final noise removed image
- b) Save the figure created in part a) as **harbour_intermediary_results.jpg**
- c) You should save the final noise-removed image as **harbour_noise_removed.jpg**.

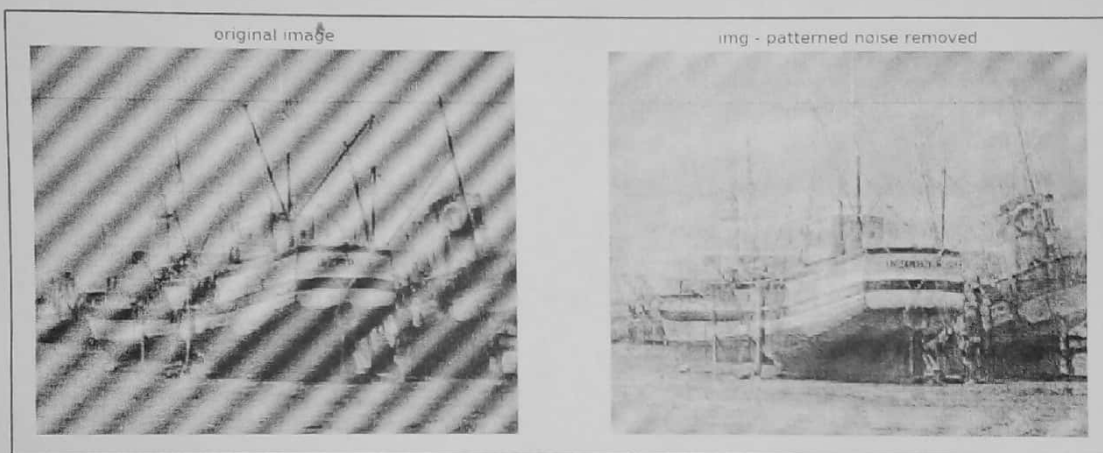


Figure 2: Expected Output of Question 02

3. [15 Marks]

Write a python **function** to perform brightness enhancement on color images and use it to enhance the brightness of the two under exposed images 'messi_1.jpg' and 'messi_2.jpg' given below (Original image 1 and Original image 2).



Figure 3: Expected Output of Question 03