OS Lab

Laboratory-6

What is ppm file?

- ppm - Portable Pixmap Image
- 24-bit color image formatted using text format.
- Pixel value 0 to 255

ppm image format

```
P3
4 4
255
0  0  0        100 0  0      0  0  0      255   0 255
0  0  0        0 255 175     0  0  0      0    0  0
0  0  0        0  0  0       0 15 175     0    0  0
255 0 255      0  0  0       0  0  0      255  255 255
```

Image Header

P3 - ppm Image format

4 4 - Number of columns and rows

255 - Maximum color value

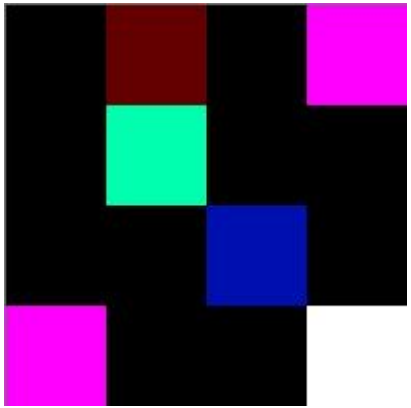
Image body

P3

4 4

255

[0 0 0]	[100 0 0]	[0 0 0]	[255 0 255]
[0 0 0]	[0 255 175]	[0 0 0]	[0 0 0]
[0 0 0]	[0 0 0]	[0 15 175]	[0 0 0]
[255 0 255]	[0 0 0]	[0 0 0]	[255 255 255]



each pixel values is represented by red, green, and blue (RGB)

[r g b]

[0 0 0] -> Represents black

[255 255 255] -> represent white

Lab-5

Part-1

- read this file and store the pixel information in a matrix
- Perform two transformations(T1 and T2) - such as “RGB to grayscale”, “edge detection”, “image blur”, etc
- Write the resultant pixel matrix to a new ppm file
- $ time ./a.out <path-to-original-image> <path-to-transformed-image>

Part-2

1. T1 and T2 are performed by **2 different threads** of the same process. They communicate through the process' address space itself.

    a. Synchronization using atomic operations

    b. Synchronization using semaphores

2. T1 and T2 are performed by **2 different processes** that communicate via **shared memory**. Synchronization using semaphores.

3. T1 and T2 are performed by **2 different processes** that communicate via **pipes**.

Report

- Briefly describe the chosen image transformations in your report.
- Devise a method to prove in each case that the pixels were received as sent, in the sent order. Describe the method in your report.
- Study the run-time and speed-up of each of the approaches and discuss.
- Discuss the relative ease/ difficulty of implementing/ debugging each approach.

Reference links

- https://en.wikipedia.org/wiki/Netpbm#:~:text=The%20P4%20binary%20format%20of,to%20fill%20a%20whole%20byte.
- http://netpbm.sourceforge.net/doc/ppm.html
- https://www.cs.swarthmore.edu/~soni/cs35/f13/Labs/extras/01/ppm_info.html