Gebze Technical University
Computer Engineering

CSE 222 - 2019 Spring

HOMEWORK 5 REPORT

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1 INTRODUCTION

1.1 Problem Definition

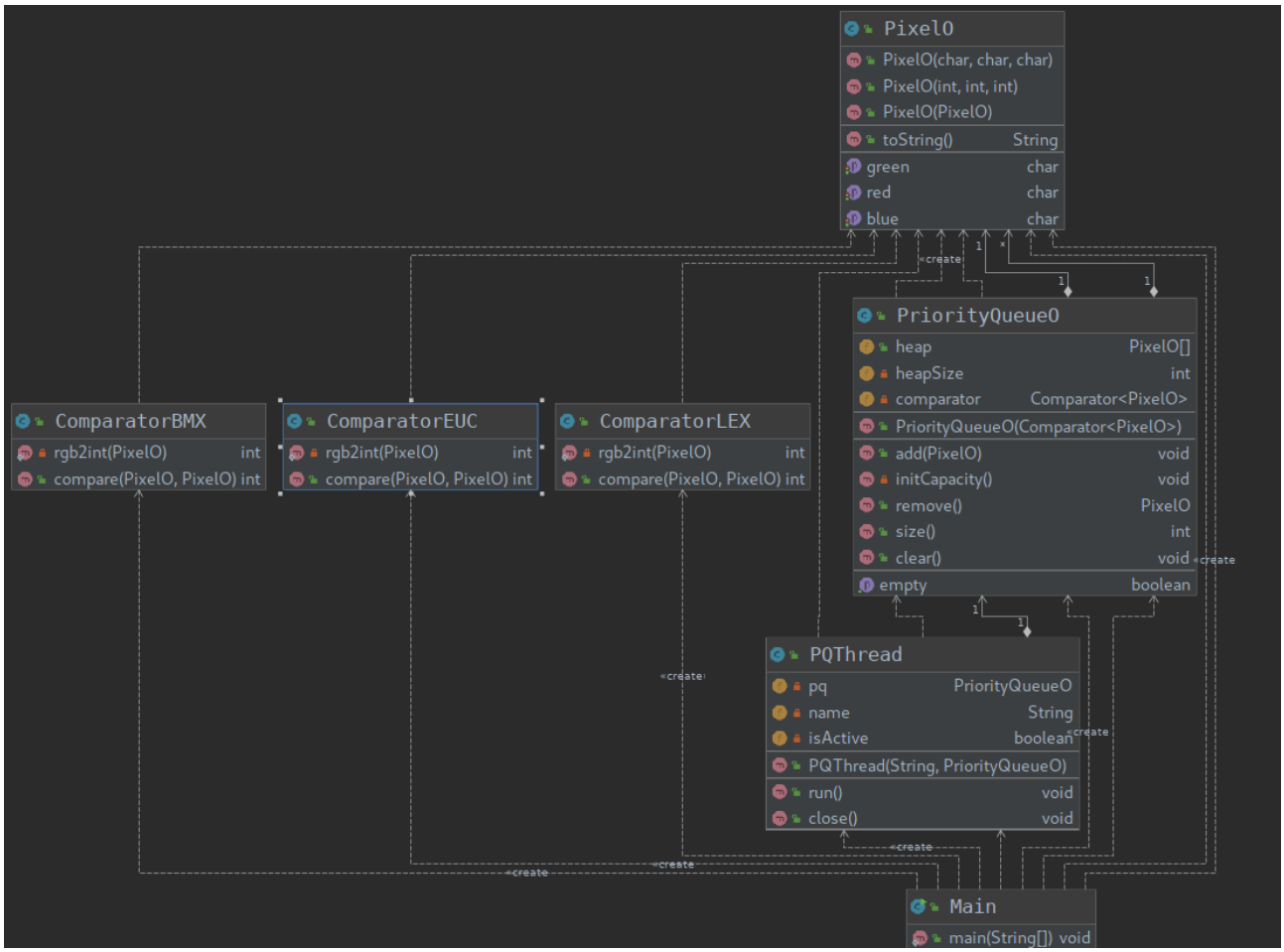
We need to read an image and implement the priority queue data structure that we implement. We need to perform these operations quickly using 4 threads at the same time. We should not use sleep method of Thread and should wait/notify methods which using interrupting.

1.2 System Requirements

A computer and JVM.

2 METHOD

2.1 Class Diagrams



2.2 Use Case Diagrams

Not required.

2.3 Problem Solution Approach

I have written three Comparators, one Thread, one Pixel, and one custom Priority Queue classes. Main Thread is reading the image and adding its pixels to three priority queue objects. While adding, its also calls notify methods every Thread which connected to the queues.

When the first hundred pixels are added, each thread start method will be called. These three threads removing and printing these pixels to the standard output. If the priority queue is empty, it will wait to its next notifying.

After the reading, Main Thread calls the close method and secondary threads break their loops. Finally, for the last time they print and remove their queues elements.

3 RESULT

3.1 Test Cases

I have run the program with a given example image and my own custom images. After some number of pixels, outputs become one by one.

3.2 Running Results

With example.png

```
Thread 1: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread3-PQEUC: [105,147,255]
Thread 1: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread3-PQEUC: [105,147,255]
Thread 1: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread 1: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread3-PQEUC: [105,147,255]
Thread3-PQEUC: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread 1: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread3-PQEUC: [105,147,255]
Thread 1: [105,147,255]
Thread2-PQLEX: [105,147,255]
Thread4-PQBMX: [105,147,255]
Thread3-PQEUC: [105,147,255]
FINISHED
```