README.md

CO332 - Heterogenous Parallel Computing

Assignment 2


```
Sagar Bharadwaj - 15CO141
Aneesh Aithal   - 15CO107
```


Q1

*Performing vector addition using the **Thrust** library*

10 datasets were generated on a single pair of input files called `input0.raw` and `input1.raw`.
The expected output was stored in `output.raw`.

Running the program

```
g++ dataset_generator.cpp
./a.out
nvcc q1.cu
./a.out output.raw input0.raw input1.raw
```

The final result can be stored in a separate file.
To do so : `./a.out output.raw input0.raw input1.raw result.raw`

Q2

Blurring an image

A header file called `ppmHelper.h` was written for the purpose of reading and writing into .ppm files.
Some new structures namely `PPMpixel` , `PPMimg` , `PPMpixelM` and `PPMimgM` are created. The purpose of each structure is mentioned as a comment.

`wb.h` file was only used for reading Command line arguments.

Input File : `texture.ppm`
Many sample outputs named `blur(X).ppm` are included in the archive. The number suffix indicates the value of the `BLUR_SIZE` used to generate the output. Higher the `BLUR_SIZE` more blurred is the image.

Running the program

```
nvcc solution.cu
./a.out texture.ppm blurx.ppm
```

Q3

*RGB image to **grayscale** image*.

The same header file `ppmHelper.h` was used for reading and writing into a .ppm image file.
Input file : `texture.ppm`
Output file : `mono.ppm`

Running the Program

```
nvcc solution.cu
./a.out texture.ppm mono.ppm
```

Q4

Matrix multiplication

10 datasets were generated. Each dataset contains two input files and one expected output file.

Input file : `input-0-dataset_number.raw` and `input-1-dataset_number.raw`
Output file : `output-dataset_number.raw`

Running the Program

```
g++ dataset_gen.cpp
./a.out
nvcc q4.cu
./a.out output-dataset_number.raw input-0-dataset_number.raw input-1-dataset_number.raw
```

Replace *dataset_number* by an integer from 0-9

Q5

Tiled matrix multiplication

The same dataset generator that was used in the previous question is used here.
10 datasets were generated. Each dataset contains two input files and one expected output file.

Input file : `input-0-dataset_number.raw` and `input-1-dataset_number.raw`
Output file : `output-dataset_number.raw`

Running the Program

```
g++ dataset_gen.cpp
./a.out
nvcc q5.cu
./a.out output-dataset_number.raw input-0-dataset_number.raw input-1-dataset_number.raw
```

Replace *dataset_number* by an integer from 0-9