

Labwork_5

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1 Implementation of Gaussian Blur filter

To implement a Gaussian Blur filter, we take inspiration from the course presentation where the functioning of the filter was exposed. We take the code from labwork 4 and modify the main function to greyscaling into a blur filter. The blur filter is based on a convolution with a matrix which here was taken from the presentation. The rest of the function not using shared memory is the same code from labwork 4. For the code that uses shared memory, we have to allocate memory for threads. Each pixel and the neighboring pixels from the threads are loaded in the shared memory. We also have to synchronize the threads.

Here is the result of a blur image :



Figure 1: Result of blur filter

2 Comparison of the results

Here are the results and graph of different block size values without shared memory :

```

Block size = 4 x 4 -> Time taken : 0.195017 sec
Block size = 8 x 8 -> Time taken : 0.002028 sec
Block size = 12 x 12 -> Time taken : 0.002167 sec
Block size = 16 x 16 -> Time taken : 0.001791 sec
Block size = 20 x 20 -> Time taken : 0.001823 sec
Block size = 24 x 24 -> Time taken : 0.001989 sec
Block size = 28 x 28 -> Time taken : 0.001771 sec
Block size = 32 x 32 -> Time taken : 0.002193 sec

```

Figure 2: Result time taken with different block size values without shared memory

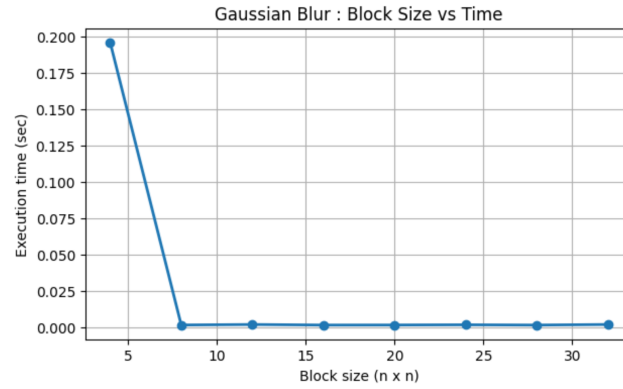


Figure 3: Graph different block size values without shared memory

Here are the results and graph of different block size values with shared memory :

```

Block size = 4 x 4 -> Time taken : 0.285604 sec
Block size = 8 x 8 -> Time taken : 0.002195 sec
Block size = 12 x 12 -> Time taken : 0.002119 sec
Block size = 16 x 16 -> Time taken : 0.001880 sec
Block size = 20 x 20 -> Time taken : 0.001903 sec
Block size = 24 x 24 -> Time taken : 0.002050 sec

```

Figure 4: Result time taken with different block size values with shared memory

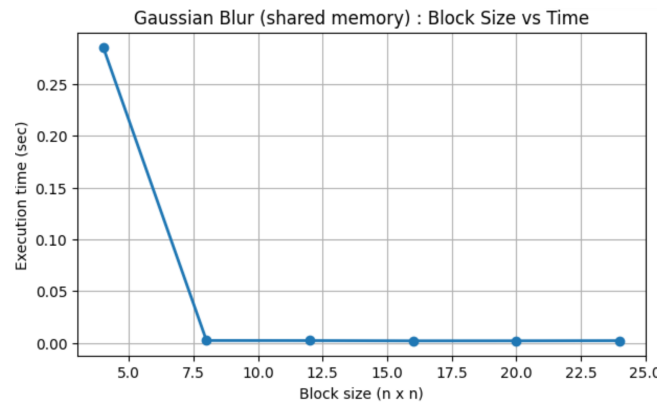


Figure 5: Graph different block size values with shared memory

Finally, we don't observe a major difference of time taken between the method without and with shared memory.