

PROJECT REPORT 4-

Case 1: i) Blocksize = 16* 16 ii) Registers PerBlock = 120 Bytes iii) Shared Memory = 30720

==29959== NVPROF is profiling process 29959, command: ./imrotate dogL.bmp dogR.bmp 4 1

==29959== Profiling application: ./imrotate dogL.bmp dogR.bmp 4 1

==29959== Profiling result:

Time(%)	Time	Calls	Avg	Min	Max	Name
57.95%	43.666ms	6	7.2777ms	6.6629ms	7.6238ms	[CUDA memcpy HtoD]
21.46%	16.172ms	3	5.3907ms	3.4195ms	6.3893ms	lab6_kernel_shared(unsigned char*, unsigned char*, int, int, double, double, double)
20.59%	15.516ms	3	5.1719ms	5.0557ms	5.2677ms	[CUDA memcpy DtoH]

==29959== API calls:

Time(%)	Time	Calls	Avg	Min	Max	Name
61.13%	685.45ms	12	57.120ms	593ns	242.60ms	cudaEventCreate
31.67%	355.10ms	3	118.37ms	114.40ms	121.22ms	cudaDeviceReset
5.51%	61.781ms	9	6.8646ms	5.4135ms	7.9450ms	cudaMemcpy
1.47%	16.535ms	3	5.5117ms	3.5486ms	6.5251ms	cudaDeviceSynchronize
0.08%	870.07us	6	145.01us	96.675us	210.86us	cudaFree
0.08%	865.21us	6	144.20us	125.12us	164.12us	cudaMalloc
0.03%	314.34us	83	3.7870us	124ns	155.33us	cuDeviceGetAttribute
0.01%	127.13us	3	42.377us	36.017us	50.725us	cudaLaunch
0.01%	56.962us	12	4.7460us	3.0600us	6.7090us	cudaEventRecord
0.00%	34.919us	1	34.919us	34.919us	34.919us	cuDeviceTotalMem
0.00%	34.338us	3	11.446us	7.3390us	18.846us	cudaSetDevice
0.00%	31.299us	1	31.299us	31.299us	31.299us	cuDeviceGetName
0.00%	21.011us	12	1.7500us	1.3380us	3.0100us	cudaEventElapsedTime
0.00%	20.395us	12	1.6990us	1.2630us	3.1650us	cudaEventSynchronize
0.00%	13.923us	21	663ns	179ns	7.6600us	cudaSetupArgument
0.00%	12.788us	12	1.0650us	474ns	2.7840us	cudaEventDestroy
0.00%	4.1090us	3	1.3690us	1.1730us	1.7310us	cudaConfigureCall
0.00%	2.8580us	2	1.4290us	572ns	2.2860us	cuDeviceGetCount
0.00%	1.4270us	3	475ns	447ns	497ns	cudaGetLastError
0.00%	711ns	2	355ns	232ns	479ns	cuDeviceGet

Loaded image 'dogL.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 15.97 ms ...

Execution = 6.38 ms ...

Tfr GPU->CPU = 5.42 ms

Total=27.77 ms

Saved image 'dogR001.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 16.25 ms ...

Execution = 3.43 ms ...

Tfr GPU->CPU = 5.51 ms

Total=25.19 ms

Saved image 'dogR002.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 14.46 ms ...

Execution = 6.41 ms ...

Tfr GPU->CPU = 5.58 ms

Total=26.45 ms

Saved image 'dogR003.bmp', size = 2400x3200 (dims = 2).

Case 2: i)Blocksize = 16*16 ii) Registers PerBlock = 120 Bytes iii) Shared Memory = 9216

==30721== NVPROF is profiling process 30721, command: ./imrotate dogL.bmp dogR.bmp 4 2

==30721== Profiling application: ./imrotate dogL.bmp dogR.bmp 4 2

==30721== Profiling result:

Time(%)	Time	Calls	Avg	Min	Max	Name
65.08%	45.036ms	6	7.5060ms	6.8920ms	8.0594ms	[CUDA memcpy HtoD]
26.60%	18.407ms	3	6.1356ms	5.9978ms	6.3069ms	[CUDA memcpy DtoH]
8.33%	5.7620ms	3	1.9207ms	1.1821ms	2.2908ms	lab6_kernel_shared(unsigned char*, unsigned char*, int, int, double, double, double)

==30721== API calls:

Time(%)	Time	Calls	Avg	Min	Max	Name
61.41%	702.54ms	12	58.545ms	539ns	260.11ms	cudaEventCreate
32.03%	366.37ms	3	122.12ms	120.56ms	124.52ms	cudaDeviceReset
5.80%	66.408ms	9	7.3786ms	6.4005ms	8.2924ms	cudaMemcpy
0.53%	6.0920ms	3	2.0307ms	1.3032ms	2.4088ms	cudaDeviceSynchronize
0.08%	935.18us	6	155.86us	99.397us	211.90us	cudaFree
0.08%	932.70us	6	155.45us	132.88us	175.71us	cudaMalloc
0.03%	336.90us	83	4.0590us	123ns	150.37us	cuDeviceGetAttribute
0.01%	133.93us	3	44.643us	39.604us	51.524us	cudaLaunch
0.01%	57.979us	12	4.8310us	3.1650us	8.0220us	cudaEventRecord
0.00%	43.272us	1	43.272us	43.272us	43.272us	cuDeviceTotalMem
0.00%	34.603us	1	34.603us	34.603us	34.603us	cuDeviceGetName
0.00%	29.934us	3	9.9780us	7.6670us	13.814us	cudaSetDevice
0.00%	22.892us	12	1.9070us	1.3620us	3.3800us	cudaEventElapsedTime
0.00%	21.762us	12	1.8130us	1.3290us	3.2810us	cudaEventSynchronize
0.00%	14.069us	12	1.1720us	534ns	3.1580us	cudaEventDestroy
0.00%	13.695us	21	652ns	146ns	8.0920us	cudaSetupArgument
0.00%	4.1330us	3	1.3770us	1.2580us	1.5900us	cudaConfigureCall
0.00%	2.2870us	2	1.1430us	384ns	1.9030us	cuDeviceGetCount
0.00%	1.2420us	3	414ns	393ns	431ns	cudaGetLastError
0.00%	626ns	2	313ns	183ns	443ns	cuDeviceGet

Loaded image 'dogL.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 16.39 ms ...

Execution = 2.31 ms ...

Tfr GPU->CPU = 6.41 ms

Total=25.10 ms

Saved image 'dogR001.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 14.93 ms ...

Execution = 1.20 ms ...

Tfr GPU->CPU = 6.51 ms

Total=22.63 ms

Saved image 'dogR002.bmp', size = 2400x3200 (dims = 2).

Tfr CPU->GPU = 16.91 ms ...

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Execution = 2.31 ms ...
Tfr GPU->CPU = 6.73 ms
Total=25.94 ms
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Saved image 'dogR003.bmp', size = 2400x3200 (dims = 2).
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Case 3: Blocksize = 32*32 Registers PerBlock = 120Bytes Shared Memory = 30720

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==31320== NVPROF is profiling process 31320, command: ./imrotate dogL.bmp dogR.bmp 4 3
==31320== Profiling application: ./imrotate dogL.bmp dogR.bmp 4 3
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==31320== Profiling result:
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Time(%)	Time	Calls	Avg	Min	Max	Name
62.59%	45.942ms	6	7.6570ms	7.1964ms	7.9170ms	[CUDA memcpy HtoD]
25.75%	18.901ms	3	6.3003ms	6.0382ms	6.6028ms	[CUDA memcpy DtoH]
11.67%	8.5633ms	3	2.8544ms	1.3362ms	3.6144ms	lab6_kernel_shared(unsigned char*, unsigned char*, int, int, double, double, double)

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==31320== API calls:
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Time(%)	Time	Calls	Avg	Min	Max	Name
60.67%	698.70ms	12	58.225ms	628ns	256.19ms	cudaEventCreate
32.45%	373.68ms	3	124.56ms	122.15ms	128.55ms	cudaDeviceReset
5.88%	67.751ms	9	7.5279ms	6.4585ms	8.1475ms	cudaMemcpy
0.77%	8.8823ms	3	2.9608ms	1.4516ms	3.7285ms	cudaDeviceSynchronize
0.08%	960.17us	6	160.03us	137.17us	192.92us	cudaMalloc
0.08%	959.19us	6	159.87us	100.14us	218.59us	cudaFree
0.03%	322.80us	83	3.8890us	123ns	141.54us	cuDeviceGetAttribute
0.01%	165.18us	3	55.061us	46.774us	64.270us	cudaLaunch
0.01%	75.247us	12	6.2700us	3.7620us	16.907us	cudaEventRecord
0.00%	42.308us	1	42.308us	42.308us	42.308us	cuDeviceTotalMem
0.00%	33.368us	1	33.368us	33.368us	33.368us	cuDeviceGetName
0.00%	28.241us	3	9.4130us	7.3900us	12.625us	cudaSetDevice
0.00%	23.141us	12	1.9280us	1.4200us	3.6030us	cudaEventSynchronize
0.00%	21.426us	12	1.7850us	1.3720us	3.1750us	cudaEventElapsedTime
0.00%	14.194us	21	675ns	157ns	8.4820us	cudaSetupArgument
0.00%	13.813us	12	1.1510us	559ns	2.9760us	cudaEventDestroy
0.00%	4.1040us	3	1.3680us	1.0950us	1.6300us	cudaConfigureCall
0.00%	2.0900us	2	1.0450us	393ns	1.6970us	cuDeviceGetCount
0.00%	1.9800us	3	660ns	442ns	974ns	cudaGetLastError
0.00%	557ns	2	278ns	157ns	400ns	cuDeviceGet

```
Loaded image 'dogL.bmp', size = 2400x3200 (dims = 2).
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Tfr CPU->GPU = 16.58 ms ...
Execution = 3.63 ms ...
Tfr GPU->CPU = 6.46 ms
Total=26.68 ms
```

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Saved image 'dogR001.bmp', size = 2400x3200 (dims = 2).
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Tfr CPU->GPU = 15.89 ms ...
Execution = 1.35 ms ...
Tfr GPU->CPU = 7.00 ms
Total=24.24 ms
```

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Saved image 'dogR002.bmp', size = 2400x3200 (dims = 2).
```

```
Tfr CPU->GPU = 16.65 ms ...
Execution = 3.63 ms ...
Tfr GPU->CPU = 6.69 ms
Total=26.97 ms
```

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Saved image 'dogR003.bmp', size = 2400x3200 (dims = 2).
```

Case 4: i) Blocksize = 32* 32 ii) Registers PerBlock = 120 Bytes iii) Shared Memory = 9126

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==31624== NVPROF is profiling process 31624, command: ./imrotate dogL.bmp dogR.bmp 4 4
==31624== Profiling application: ./imrotate dogL.bmp dogR.bmp 4 4
```

```
==31624== Profiling result:
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Time(%)	Time	Calls	Avg	Min	Max	Name
57.11%	41.885ms	6	6.9808ms	6.7637ms	7.1543ms	[CUDA memcpy HtoD]
32.64%	23.935ms	3	7.9782ms	5.4404ms	12.353ms	[CUDA memcpy DtoH]
10.25%	7.5181ms	3	2.5060ms	1.6572ms	2.9349ms	lab6_kernel_shared(unsigned char*, unsigned char*, int, int, double, double, double)

```
==31624== API calls:
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Time(%)	Time	Calls	Avg	Min	Max	Name
55.79%	841.15ms	12	70.096ms	588ns	315.26ms	cudaEventCreate
38.35%	578.20ms	3	192.73ms	118.63ms	272.26ms	cudaDeviceReset
4.69%	70.706ms	9	7.8562ms	5.7712ms	15.027ms	cudaMemcpy
0.54%	8.1551ms	6	1.3592ms	102.14us	7.3991ms	cudaFree
0.52%	7.8568ms	3	2.6190ms	1.7700ms	3.0517ms	cudaDeviceSynchronize
0.06%	876.03us	6	146.00us	129.77us	175.62us	cudaMalloc
0.02%	281.65us	83	3.3930us	120ns	130.14us	cuDeviceGetAttribute
0.01%	137.83us	3	45.943us	40.177us	50.358us	cudaLaunch
0.00%	73.843us	12	6.1530us	3.1300us	19.401us	cudaEventRecord
0.00%	33.329us	1	33.329us	33.329us	33.329us	cuDeviceTotalMem
0.00%	32.641us	3	10.880us	6.4500us	18.751us	cudaSetDevice
0.00%	30.574us	1	30.574us	30.574us	30.574us	cuDeviceGetName
0.00%	22.266us	12	1.8550us	1.3880us	3.3310us	cudaEventSynchronize
0.00%	21.682us	12	1.8060us	1.3500us	3.4520us	cudaEventElapsedTime
0.00%	14.098us	12	1.1740us	528ns	3.2910us	cudaEventDestroy
0.00%	11.820us	21	562ns	154ns	6.3460us	cudaSetupArgument
0.00%	4.7510us	3	1.5830us	1.1410us	2.4670us	cudaConfigureCall
0.00%	3.0770us	2	1.5380us	521ns	2.5560us	cuDeviceGetCount
0.00%	1.4870us	3	495ns	471ns	530ns	cudaGetLastError
0.00%	805ns	2	402ns	220ns	585ns	cuDeviceGet

```
Loaded image 'dogL.bmp', size = 2400x3200 (dims = 2).
```

```
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Tfr CPU->GPU = 14.90 ms ...
Execution = 2.95 ms ...
Tfr GPU->CPU = 15.05 ms
Total=32.90 ms
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```
-----
Saved image 'dogR001.bmp', size = 2400x3200 (dims = 2).
```

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Tfr CPU->GPU = 15.06 ms ...
Execution = 1.67 ms ...
Tfr GPU->CPU = 6.49 ms
Total=23.22 ms
```

```
-----
Saved image 'dogR002.bmp', size = 2400x3200 (dims = 2).
```

Tfr CPU->GPU = 14.86 ms ...

Execution = 2.94 ms ...

Tfr GPU->CPU = 5.78 ms

Total=23.58 ms

Saved image 'dogR003.bmp', size = 2400x3200 (dims = 2).

salloc: Relinquishing job allocation 6302044