HW2: PosixProgram Timings Synopsis

Thread counts: 1

```
[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2

          Homework 2 Synopsis:
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Total number of threads: 1
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 100000000 10.000000 0
Attaching to thread 0

>>Total time to create array: 1.997912 seconds

==========================================

Summing the Array

Arguments: 100000000 0
Attaching to thread 0

>>Sum of the array: 500010842.857140
>>Total time to calculate the sum of the array: 0.269570 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 100000000 0.000000 0 5.000108
Attaching to thread 0

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 1.806752 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.833107 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.985024 seconds
[jland@qbert PosixProgram]$
```

Thread counts: 2

```
[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 2
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 50000000 10.000000 0
Arguments: 50000000 10.000000 50000000
Attaching to thread 0
Attaching to thread 1

>>Total time to create array: 6.026697 seconds

==========================================

Summing the Array

Arguments: 50000000 0
Arguments: 50000000 50000000
Attaching to thread 0
Attaching to thread 1

>>Sum of the array: 500010842.857220
>>Total time to calculate the sum of the array: 0.140628 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 50000000 0.000000 0 5.000108
Arguments: 50000000 0.000000 50000000 5.000108
Attaching to thread 0
Attaching to thread 1

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 1.065419 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.814152 seconds

==========================================

Smoothing the Array
```

```
Total time to calculate parallelized array after smooth: 0.511617 seconds
Thread counts: 4

[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 4
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 25000000 10.000000 0
Arguments: 25000000 10.000000 25000000
Arguments: 25000000 10.000000 50000000
Arguments: 25000000 10.000000 75000000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3

>>Total time to create array: 21.519553 seconds

==========================================

Summing the Array

Arguments: 25000000 0
Arguments: 25000000 25000000
Arguments: 25000000 50000000
Arguments: 25000000 75000000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3

>>Sum of the array: 500010842.857398
>>Total time to calculate the sum of the array: 0.083628 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 25000000 0.000000 0 5.000108
Arguments: 25000000 0.000000 25000000 5.000108
Arguments: 25000000 0.000000 50000000 5.000108
Arguments: 25000000 0.000000 75000000 5.000108
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
```

```
>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.683274 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.811824 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.266861 seconds
[jland@qbert PosixProgram]$
```

Thread counts: 8

```
[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 8
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 12500000 10.000000 0
Arguments: 12500000 10.000000 12500000
Arguments: 12500000 10.000000 25000000
Arguments: 12500000 10.000000 37500000
Arguments: 12500000 10.000000 50000000
Arguments: 12500000 10.000000 62500000
Arguments: 12500000 10.000000 75000000
Arguments: 12500000 10.000000 87500000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7

>>Total time to create array: 15.112328 seconds

==========================================

Summing the Array

Arguments: 12500000 0
Arguments: 12500000 12500000
Arguments: 12500000 25000000
Arguments: 12500000 37500000
Arguments: 12500000 50000000
Arguments: 12500000 62500000
Arguments: 12500000 75000000
Arguments: 12500000 87500000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
```

```
>>Sum of the array: 500010842.857338
>>Total time to calculate the sum of the array: 0.039096 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 12500000 0.000000 0 5.000108
Arguments: 12500000 0.000000 12500000 5.000108
Arguments: 12500000 0.000000 25000000 5.000108
Arguments: 12500000 0.000000 37500000 5.000108
Arguments: 12500000 0.000000 50000000 5.000108
Arguments: 12500000 0.000000 62500000 5.000108
Arguments: 12500000 0.000000 75000000 5.000108
Arguments: 12500000 0.000000 87500000 5.000108
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.497991 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.815412 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.140621 seconds
```

```
Thread counts: 16

[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 16
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 6250000 10.000000 0
Arguments: 6250000 10.000000 6250000
Arguments: 6250000 10.000000 12500000
Arguments: 6250000 10.000000 18750000
Arguments: 6250000 10.000000 25000000
Arguments: 6250000 10.000000 31250000
Arguments: 6250000 10.000000 37500000
Arguments: 6250000 10.000000 43750000
Arguments: 6250000 10.000000 50000000
Arguments: 6250000 10.000000 56250000
Arguments: 6250000 10.000000 62500000
Arguments: 6250000 10.000000 68750000
Arguments: 6250000 10.000000 75000000
Arguments: 6250000 10.000000 81250000
Arguments: 6250000 10.000000 87500000
Arguments: 6250000 10.000000 93750000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15

>>Total time to create array: 13.778166 seconds

==========================================

Summing the Array
```

```
Arguments: 6250000 0
Arguments: 6250000 6250000
Arguments: 6250000 12500000
Arguments: 6250000 18750000
Arguments: 6250000 25000000
Arguments: 6250000 31250000
Arguments: 6250000 37500000
Arguments: 6250000 43750000
Arguments: 6250000 50000000
Arguments: 6250000 56250000
Arguments: 6250000 62500000
Arguments: 6250000 68750000
Arguments: 6250000 75000000
Arguments: 6250000 81250000
Arguments: 6250000 87500000
Arguments: 6250000 93750000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15

>>Sum of the array: 500010842.857346
>>Total time to calculate the sum of the array: 0.033306 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 6250000 0.000000 0 5.000108
Arguments: 6250000 0.000000 6250000 5.000108
Arguments: 6250000 0.000000 12500000 5.000108
Arguments: 6250000 0.000000 18750000 5.000108
Arguments: 6250000 0.000000 25000000 5.000108
Arguments: 6250000 0.000000 31250000 5.000108
Arguments: 6250000 0.000000 37500000 5.000108
Arguments: 6250000 0.000000 43750000 5.000108
Arguments: 6250000 0.000000 50000000 5.000108
Arguments: 6250000 0.000000 56250000 5.000108
Arguments: 6250000 0.000000 62500000 5.000108
Arguments: 6250000 0.000000 68750000 5.000108
Arguments: 6250000 0.000000 75000000 5.000108
Arguments: 6250000 0.000000 81250000 5.000108
Arguments: 6250000 0.000000 87500000 5.000108
Arguments: 6250000 0.000000 93750000 5.000108
Attaching to thread 0
```

```
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.454945 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.884992 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.109811 seconds
```

```
Thread counts: 32

[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 32
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 3125000 10.000000 0
Arguments: 3125000 10.000000 3125000
Arguments: 3125000 10.000000 6250000
Arguments: 3125000 10.000000 9375000
Arguments: 3125000 10.000000 12500000
Arguments: 3125000 10.000000 15625000
Arguments: 3125000 10.000000 18750000
Arguments: 3125000 10.000000 21875000
Arguments: 3125000 10.000000 25000000
Arguments: 3125000 10.000000 28125000
Arguments: 3125000 10.000000 31250000
Arguments: 3125000 10.000000 34375000
Arguments: 3125000 10.000000 37500000
Arguments: 3125000 10.000000 40625000
Arguments: 3125000 10.000000 43750000
Arguments: 3125000 10.000000 46875000
Arguments: 3125000 10.000000 50000000
Arguments: 3125000 10.000000 53125000
Arguments: 3125000 10.000000 56250000
Arguments: 3125000 10.000000 59375000
Arguments: 3125000 10.000000 62500000
Arguments: 3125000 10.000000 65625000
Arguments: 3125000 10.000000 68750000
Arguments: 3125000 10.000000 71875000
Arguments: 3125000 10.000000 75000000
Arguments: 3125000 10.000000 78125000
Arguments: 3125000 10.000000 81250000
Arguments: 3125000 10.000000 84375000
Arguments: 3125000 10.000000 87500000
Arguments: 3125000 10.000000 90625000
Arguments: 3125000 10.000000 93750000
Arguments: 3125000 10.000000 96875000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
```

```
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15
Attaching to thread 16
Attaching to thread 17
Attaching to thread 18
Attaching to thread 19
Attaching to thread 20
Attaching to thread 21
Attaching to thread 22
Attaching to thread 23
Attaching to thread 24
Attaching to thread 25
Attaching to thread 26
Attaching to thread 27
Attaching to thread 28
Attaching to thread 29
Attaching to thread 30
Attaching to thread 31

>>Total time to create array: 14.355054 seconds

==========================================

Summing the Array

Arguments: 3125000 0
Arguments: 3125000 3125000
Arguments: 3125000 6250000
Arguments: 3125000 9375000
Arguments: 3125000 12500000
Arguments: 3125000 15625000
Arguments: 3125000 18750000
Arguments: 3125000 21875000
Arguments: 3125000 25000000
Arguments: 3125000 28125000
Arguments: 3125000 31250000
Arguments: 3125000 34375000
Arguments: 3125000 37500000
Arguments: 3125000 40625000
Arguments: 3125000 43750000
Arguments: 3125000 46875000
Arguments: 3125000 50000000
Arguments: 3125000 53125000
Arguments: 3125000 56250000
Arguments: 3125000 59375000
Arguments: 3125000 62500000
Arguments: 3125000 65625000
Arguments: 3125000 68750000
Arguments: 3125000 71875000
Arguments: 3125000 75000000
```

```
Arguments: 3125000 78125000
Arguments: 3125000 81250000
Arguments: 3125000 84375000
Arguments: 3125000 87500000
Arguments: 3125000 90625000
Arguments: 3125000 93750000
Arguments: 3125000 96875000
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15
Attaching to thread 16
Attaching to thread 17
Attaching to thread 18
Attaching to thread 19
Attaching to thread 20
Attaching to thread 21
Attaching to thread 22
Attaching to thread 23
Attaching to thread 24
Attaching to thread 25
Attaching to thread 26
Attaching to thread 27
Attaching to thread 28
Attaching to thread 29
Attaching to thread 30
Attaching to thread 31

>>Sum of the array: 500010842.857336
>>Total time to calculate the sum of the array: 0.030182 seconds

==========================================

Standard Deviation of the Array(parallelized)

Arguments: 3125000 0.000000 0 5.000108
Arguments: 3125000 0.000000 3125000 5.000108
Arguments: 3125000 0.000000 6250000 5.000108
Arguments: 3125000 0.000000 9375000 5.000108
Arguments: 3125000 -nan 12500000 5.000108
Arguments: 3125000 0.000000 15625000 5.000108
Arguments: 3125000 0.000000 18750000 5.000108
Arguments: 3125000 0.000000 21875000 5.000108
Arguments: 3125000 -nan 25000000 5.000108
Arguments: 3125000 0.000000 28125000 5.000108
```

```
Arguments: 3125000 0.000000 31250000 5.000108
Arguments: 3125000 0.000000 34375000 5.000108
Arguments: 3125000 0.000000 37500000 5.000108
Arguments: 3125000 0.000000 40625000 5.000108
Arguments: 3125000 0.000000 43750000 5.000108
Arguments: 3125000 0.000000 46875000 5.000108
Arguments: 3125000 0.000000 50000000 5.000108
Arguments: 3125000 0.000000 53125000 5.000108
Arguments: 3125000 0.000000 56250000 5.000108
Arguments: 3125000 0.000000 59375000 5.000108
Arguments: 3125000 0.000000 62500000 5.000108
Arguments: 3125000 0.000000 65625000 5.000108
Arguments: 3125000 0.000000 68750000 5.000108
Arguments: 3125000 0.000000 71875000 5.000108
Arguments: 3125000 0.000000 75000000 5.000108
Arguments: 3125000 0.000000 78125000 5.000108
Arguments: 3125000 0.000000 81250000 5.000108
Arguments: 3125000 0.000000 84375000 5.000108
Arguments: 3125000 0.000000 87500000 5.000108
Arguments: 3125000 0.000000 90625000 5.000108
Arguments: 3125000 0.000000 93750000 5.000108
Arguments: 3125000 0.000000 96875000 5.000108
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15
Attaching to thread 16
Attaching to thread 17
Attaching to thread 18
Attaching to thread 19
Attaching to thread 20
Attaching to thread 21
Attaching to thread 22
Attaching to thread 23
Attaching to thread 24
Attaching to thread 25
Attaching to thread 26
Attaching to thread 27
Attaching to thread 28
Attaching to thread 29
Attaching to thread 30
Attaching to thread 31

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.452548 seconds
```

```
>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 2.029504 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.093699 seconds
```

```
Thread counts: 64

[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 64
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 1562500 10.000000 0
Arguments: 1562500 10.000000 1562500
Arguments: 1562500 10.000000 3125000
Arguments: 1562500 10.000000 4687500
Arguments: 1562500 10.000000 6250000
Arguments: 1562500 10.000000 7812500
Arguments: 1562500 10.000000 9375000
Arguments: 1562500 10.000000 10937500
Arguments: 1562500 10.000000 12500000
Arguments: 1562500 10.000000 14062500
Arguments: 1562500 10.000000 15625000
Arguments: 1562500 10.000000 17187500
Arguments: 1562500 10.000000 18750000
Arguments: 1562500 10.000000 20312500
Arguments: 1562500 10.000000 21875000
Arguments: 1562500 10.000000 23437500
Arguments: 1562500 10.000000 25000000
Arguments: 1562500 10.000000 26562500
Arguments: 1562500 10.000000 28125000
Arguments: 1562500 10.000000 29687500
Arguments: 1562500 10.000000 31250000
Arguments: 1562500 10.000000 32812500
Arguments: 1562500 10.000000 34375000
Arguments: 1562500 10.000000 35937500
Arguments: 1562500 10.000000 37500000
Arguments: 1562500 10.000000 39062500
Arguments: 1562500 10.000000 40625000
Arguments: 1562500 10.000000 42187500
Arguments: 1562500 10.000000 43750000
Arguments: 1562500 10.000000 45312500
Arguments: 1562500 10.000000 46875000
Arguments: 1562500 10.000000 48437500
Arguments: 1562500 10.000000 50000000
Arguments: 1562500 10.000000 51562500
Arguments: 1562500 10.000000 53125000
Arguments: 1562500 10.000000 54687500
Arguments: 1562500 10.000000 56250000
Arguments: 1562500 10.000000 57812500
Arguments: 1562500 10.000000 59375000
```

```
Arguments: 1562500 10.000000 60937500
Arguments: 1562500 10.000000 62500000
Arguments: 1562500 10.000000 64062500
Arguments: 1562500 10.000000 65625000
Arguments: 1562500 10.000000 67187500
Arguments: 1562500 10.000000 68750000
Arguments: 1562500 10.000000 70312500
Arguments: 1562500 10.000000 71875000
Arguments: 1562500 10.000000 73437500
Arguments: 1562500 10.000000 75000000
Arguments: 1562500 10.000000 76562500
Arguments: 1562500 10.000000 78125000
Arguments: 1562500 10.000000 79687500
Arguments: 1562500 10.000000 81250000
Arguments: 1562500 10.000000 82812500
Arguments: 1562500 10.000000 84375000
Arguments: 1562500 10.000000 85937500
Arguments: 1562500 10.000000 87500000
Arguments: 1562500 10.000000 89062500
Arguments: 1562500 10.000000 90625000
Arguments: 1562500 10.000000 92187500
Arguments: 1562500 10.000000 93750000
Arguments: 1562500 10.000000 95312500
Arguments: 1562500 10.000000 96875000
Arguments: 1562500 10.000000 98437500
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15
Attaching to thread 16
Attaching to thread 17
Attaching to thread 18
Attaching to thread 19
Attaching to thread 20
Attaching to thread 21
Attaching to thread 22
Attaching to thread 23
Attaching to thread 24
Attaching to thread 25
Attaching to thread 26
Attaching to thread 27
Attaching to thread 28
Attaching to thread 29
Attaching to thread 30
Attaching to thread 31
```

```
Attaching to thread 32
Attaching to thread 33
Attaching to thread 34
Attaching to thread 35
Attaching to thread 36
Attaching to thread 37
Attaching to thread 38
Attaching to thread 39
Attaching to thread 40
Attaching to thread 41
Attaching to thread 42
Attaching to thread 43
Attaching to thread 44
Attaching to thread 45
Attaching to thread 46
Attaching to thread 47
Attaching to thread 48
Attaching to thread 49
Attaching to thread 50
Attaching to thread 51
Attaching to thread 52
Attaching to thread 53
Attaching to thread 54
Attaching to thread 55
Attaching to thread 56
Attaching to thread 57
Attaching to thread 58
Attaching to thread 59
Attaching to thread 60
Attaching to thread 61
Attaching to thread 62
Attaching to thread 63

>>Total time to create array: 14.522648 seconds

==========================================

Summing the Array

Arguments: 1562500 0
Arguments: 1562500 1562500
Arguments: 1562500 3125000
Arguments: 1562500 4687500
Arguments: 1562500 6250000
Arguments: 1562500 7812500
Arguments: 1562500 9375000
Arguments: 1562500 10937500
Arguments: 1562500 12500000
Arguments: 1562500 14062500
Arguments: 1562500 15625000
Arguments: 1562500 17187500
Arguments: 1562500 18750000
Arguments: 1562500 20312500
Arguments: 1562500 21875000
Arguments: 1562500 23437500
Arguments: 1562500 25000000
Arguments: 1562500 26562500
```

```
Arguments: 1562500 28125000
Arguments: 1562500 29687500
Arguments: 1562500 31250000
Arguments: 1562500 32812500
Arguments: 1562500 34375000
Arguments: 1562500 35937500
Arguments: 1562500 37500000
Arguments: 1562500 39062500
Arguments: 1562500 40625000
Arguments: 1562500 42187500
Arguments: 1562500 43750000
Arguments: 1562500 45312500
Arguments: 1562500 46875000
Arguments: 1562500 48437500
Arguments: 1562500 50000000
Arguments: 1562500 51562500
Arguments: 1562500 53125000
Arguments: 1562500 54687500
Arguments: 1562500 56250000
Arguments: 1562500 57812500
Arguments: 1562500 59375000
Arguments: 1562500 60937500
Arguments: 1562500 62500000
Arguments: 1562500 64062500
Arguments: 1562500 65625000
Arguments: 1562500 67187500
Arguments: 1562500 68750000
Arguments: 1562500 70312500
Arguments: 1562500 71875000
Arguments: 1562500 73437500
Arguments: 1562500 75000000
Arguments: 1562500 76562500
Arguments: 1562500 78125000
Arguments: 1562500 79687500
Arguments: 1562500 81250000
Arguments: 1562500 82812500
Arguments: 1562500 84375000
Arguments: 1562500 85937500
Arguments: 1562500 87500000
Arguments: 1562500 89062500
Arguments: 1562500 90625000
Arguments: 1562500 92187500
Arguments: 1562500 93750000
Arguments: 1562500 95312500
Arguments: 1562500 96875000
Arguments: 1562500 98437500
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
Attaching to thread 4
Attaching to thread 5
Attaching to thread 6
Attaching to thread 7
Attaching to thread 8
Attaching to thread 9
Attaching to thread 10
```

```
Attaching to thread 11
Attaching to thread 12
Attaching to thread 13
Attaching to thread 14
Attaching to thread 15
Attaching to thread 16
Attaching to thread 17
Attaching to thread 18
Attaching to thread 19
Attaching to thread 20
Attaching to thread 21
Attaching to thread 22
Attaching to thread 23
Attaching to thread 24
Attaching to thread 25
Attaching to thread 26
Attaching to thread 27
Attaching to thread 28
Attaching to thread 29
Attaching to thread 30
Attaching to thread 31
Attaching to thread 32
Attaching to thread 33
Attaching to thread 34
Attaching to thread 35
Attaching to thread 36
Attaching to thread 37
Attaching to thread 38
Attaching to thread 39
Attaching to thread 40
Attaching to thread 41
Attaching to thread 42
Attaching to thread 43
Attaching to thread 44
Attaching to thread 45
Attaching to thread 46
Attaching to thread 47
Attaching to thread 48
Attaching to thread 49
Attaching to thread 50
Attaching to thread 51
Attaching to thread 52
Attaching to thread 53
Attaching to thread 54
Attaching to thread 55
Attaching to thread 56
Attaching to thread 57
Attaching to thread 58
Attaching to thread 59
Attaching to thread 60
Attaching to thread 61
Attaching to thread 62
Attaching to thread 63

>>Sum of the array: 500010842.857344
>>Total time to calculate the sum of the array: 0.035125 seconds
```

==========

Standard Deviation of the Array(parallelized)

Arguments: 1562500 0.000000 0 5.000108
Arguments: 1562500 0.000000 1562500 5.000108
Arguments: 1562500 0.000000 3125000 5.000108
Arguments: 1562500 0.000000 4687500 5.000108
Arguments: 1562500 0.000000 6250000 5.000108
Arguments: 1562500 0.000000 7812500 5.000108
Arguments: 1562500 0.000000 9375000 5.000108
Arguments: 1562500 0.000000 10937500 5.000108
Arguments: 1562500 0.000000 12500000 5.000108
Arguments: 1562500 0.000000 14062500 5.000108
Arguments: 1562500 0.000000 15625000 5.000108
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Arguments: 1562500 0.000000 18750000 5.000108
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Arguments: 1562500 0.000000 71875000 5.000108
Arguments: 1562500 0.000000 73437500 5.000108
Arguments: 1562500 0.000000 75000000 5.000108
Arguments: 1562500 0.000000 76562500 5.000108
Arguments: 1562500 0.000000 78125000 5.000108
Arguments: 1562500 0.000000 79687500 5.000108
Arguments: 1562500 0.000000 81250000 5.000108

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Arguments: 1562500 0.000000 82812500 5.000108
Arguments: 1562500 0.000000 84375000 5.000108
Arguments: 1562500 0.000000 85937500 5.000108
Arguments: 1562500 0.000000 87500000 5.000108
Arguments: 1562500 0.000000 89062500 5.000108
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Arguments: 1562500 0.000000 96875000 5.000108
Arguments: 1562500 0.000000 98437500 5.000108
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Attaching to thread 62
Attaching to thread 63

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.446378 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 2.038107 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.123000 seconds
```

```
Thread counts: 64 (again)

[jland@qbert PosixProgram]$ gcc -g -o PosixProgrammHW2 HW2_posix.c
HW2_posix_main.c -lpthread -lm
[jland@qbert PosixProgram]$ ./PosixProgrammHW2
          Homework 2 Synopsis:
==========================================

Total number of threads: 64
Size of array: 100000000
Weight of smooth: 0.100000

==========================================

Creating the Array

Arguments: 1562500 10.000000 0
Arguments: 1562500 10.000000 1562500
Arguments: 1562500 10.000000 3125000
Arguments: 1562500 10.000000 4687500
Arguments: 1562500 10.000000 6250000
Arguments: 1562500 10.000000 7812500
Arguments: 1562500 10.000000 9375000
Arguments: 1562500 10.000000 10937500
Arguments: 1562500 10.000000 12500000
Arguments: 1562500 10.000000 14062500
Arguments: 1562500 10.000000 15625000
Arguments: 1562500 10.000000 17187500
Arguments: 1562500 10.000000 18750000
Arguments: 1562500 10.000000 20312500
Arguments: 1562500 10.000000 21875000
Arguments: 1562500 10.000000 23437500
Arguments: 1562500 10.000000 25000000
Arguments: 1562500 10.000000 26562500
Arguments: 1562500 10.000000 28125000
Arguments: 1562500 10.000000 29687500
Arguments: 1562500 10.000000 31250000
Arguments: 1562500 10.000000 32812500
Arguments: 1562500 10.000000 34375000
Arguments: 1562500 10.000000 35937500
Arguments: 1562500 10.000000 37500000
Arguments: 1562500 10.000000 39062500
Arguments: 1562500 10.000000 40625000
Arguments: 1562500 10.000000 42187500
Arguments: 1562500 10.000000 43750000
Arguments: 1562500 10.000000 45312500
Arguments: 1562500 10.000000 46875000
Arguments: 1562500 10.000000 48437500
Arguments: 1562500 10.000000 50000000
Arguments: 1562500 10.000000 51562500
Arguments: 1562500 10.000000 53125000
Arguments: 1562500 10.000000 54687500
Arguments: 1562500 10.000000 56250000
Arguments: 1562500 10.000000 57812500
Arguments: 1562500 10.000000 59375000
```

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Arguments: 1562500 10.000000 60937500
Arguments: 1562500 10.000000 62500000
Arguments: 1562500 10.000000 64062500
Arguments: 1562500 10.000000 65625000
Arguments: 1562500 10.000000 67187500
Arguments: 1562500 10.000000 68750000
Arguments: 1562500 10.000000 70312500
Arguments: 1562500 10.000000 71875000
Arguments: 1562500 10.000000 73437500
Arguments: 1562500 10.000000 75000000
Arguments: 1562500 10.000000 76562500
Arguments: 1562500 10.000000 78125000
Arguments: 1562500 10.000000 79687500
Arguments: 1562500 10.000000 81250000
Arguments: 1562500 10.000000 82812500
Arguments: 1562500 10.000000 84375000
Arguments: 1562500 10.000000 85937500
Arguments: 1562500 10.000000 87500000
Arguments: 1562500 10.000000 89062500
Arguments: 1562500 10.000000 90625000
Arguments: 1562500 10.000000 92187500
Arguments: 1562500 10.000000 93750000
Arguments: 1562500 10.000000 95312500
Arguments: 1562500 10.000000 96875000
Arguments: 1562500 10.000000 98437500
Attaching to thread 0
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Attaching to thread 61
Attaching to thread 62
Attaching to thread 63

>>Total time to create array: 14.402203 seconds

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Summing the Array

Arguments: 1562500 0
Arguments: 1562500 1562500
Arguments: 1562500 3125000
Arguments: 1562500 4687500
Arguments: 1562500 6250000
Arguments: 1562500 7812500
Arguments: 1562500 9375000
Arguments: 1562500 10937500
Arguments: 1562500 12500000
Arguments: 1562500 14062500
Arguments: 1562500 15625000
Arguments: 1562500 17187500
Arguments: 1562500 18750000
Arguments: 1562500 20312500
Arguments: 1562500 21875000
Arguments: 1562500 23437500
Arguments: 1562500 25000000
Arguments: 1562500 26562500
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Arguments: 1562500 28125000
Arguments: 1562500 29687500
Arguments: 1562500 31250000
Arguments: 1562500 32812500
Arguments: 1562500 34375000
Arguments: 1562500 35937500
Arguments: 1562500 37500000
Arguments: 1562500 39062500
Arguments: 1562500 40625000
Arguments: 1562500 42187500
Arguments: 1562500 43750000
Arguments: 1562500 45312500
Arguments: 1562500 46875000
Arguments: 1562500 48437500
Arguments: 1562500 50000000
Arguments: 1562500 51562500
Arguments: 1562500 53125000
Arguments: 1562500 54687500
Arguments: 1562500 56250000
Arguments: 1562500 57812500
Arguments: 1562500 59375000
Arguments: 1562500 60937500
Arguments: 1562500 62500000
Arguments: 1562500 64062500
Arguments: 1562500 65625000
Arguments: 1562500 67187500
Arguments: 1562500 68750000
Arguments: 1562500 70312500
Arguments: 1562500 71875000
Arguments: 1562500 73437500
Arguments: 1562500 75000000
Arguments: 1562500 76562500
Arguments: 1562500 78125000
Arguments: 1562500 79687500
Arguments: 1562500 81250000
Arguments: 1562500 82812500
Arguments: 1562500 84375000
Arguments: 1562500 85937500
Arguments: 1562500 87500000
Arguments: 1562500 89062500
Arguments: 1562500 90625000
Arguments: 1562500 92187500
Arguments: 1562500 93750000
Arguments: 1562500 95312500
Arguments: 1562500 96875000
Arguments: 1562500 98437500
Attaching to thread 0
Attaching to thread 1
Attaching to thread 2
Attaching to thread 3
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Attaching to thread 62
Attaching to thread 63

>>Sum of the array: 500010842.857344
>>Total time to calculate the sum of the array: 0.025149 seconds
```

```
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Standard Deviation of the Array(parallelized)

Arguments: 1562500 0.000000 0 5.000108
Arguments: 1562500 0.000000 1562500 5.000108
Arguments: 1562500 0.000000 3125000 5.000108
Arguments: 1562500 0.000000 4687500 5.000108
Arguments: 1562500 0.000000 6250000 5.000108
Arguments: 1562500 0.000000 7812500 5.000108
Arguments: 1562500 0.000000 9375000 5.000108
Arguments: 1562500 0.000000 10937500 5.000108
Arguments: 1562500 0.000000 12500000 5.000108
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Arguments: 1562500 0.000000 37500000 5.000108
Arguments: 1562500 0.000000 39062500 5.000108
Arguments: 1562500 0.000000 40625000 5.000108
Arguments: 1562500 0.000000 42187500 5.000108
Arguments: 1562500 0.000000 43750000 5.000108
Arguments: 1562500 0.000000 45312500 5.000108
Arguments: 1562500 0.000000 46875000 5.000108
Arguments: 1562500 0.000000 48437500 5.000108
Arguments: 1562500 0.000000 50000000 5.000108
Arguments: 1562500 0.000000 51562500 5.000108
Arguments: 1562500 0.000000 53125000 5.000108
Arguments: 1562500 0.000000 54687500 5.000108
Arguments: 1562500 0.000000 56250000 5.000108
Arguments: 1562500 0.000000 57812500 5.000108
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Arguments: 1562500 0.000000 60937500 5.000108
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Arguments: 1562500 0.000000 64062500 5.000108
Arguments: 1562500 0.000000 65625000 5.000108
Arguments: 1562500 0.000000 67187500 5.000108
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Arguments: 1562500 0.000000 75000000 5.000108
Arguments: 1562500 0.000000 76562500 5.000108
Arguments: 1562500 0.000000 78125000 5.000108
Arguments: 1562500 0.000000 79687500 5.000108
Arguments: 1562500 0.000000 81250000 5.000108
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Arguments: 1562500 0.000000 82812500 5.000108
Arguments: 1562500 0.000000 84375000 5.000108
Arguments: 1562500 0.000000 85937500 5.000108
Arguments: 1562500 0.000000 87500000 5.000108
Arguments: 1562500 0.000000 89062500 5.000108
Arguments: 1562500 0.000000 90625000 5.000108
Arguments: 1562500 0.000000 92187500 5.000108
Arguments: 1562500 0.000000 93750000 5.000108
Arguments: 1562500 0.000000 95312500 5.000108
Arguments: 1562500 0.000000 96875000 5.000108
Arguments: 1562500 0.000000 98437500 5.000108
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Attaching to thread 63

>>Standard deviation of parallelized array: 2.886603
>>Total time to calculate parallelized standard deviation: 0.386584 seconds

>>Standard deviation of original/serial array: 2.886603

>>Result of original/serial standard deviation (i.e., HW1): 2.886603
>>Total time to calculate original/serial standard deviation: 1.823138 seconds

==========================================

Smoothing the Array

Total time to calculate parallelized array after smooth: 0.076865 seconds
```