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SE-Comps B/Batch C

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OS Experiment 4 : Multithreading

(All source code files are submitted on moodle)

Part 1:

Problem statement: Write a multithreaded program that calculates various statistical values for a list of numbers. This program will be passed a series of numbers on the command line and will then create three separate worker threads. One thread will determine the average of the numbers, the second will determine the maximum value, and the third will determine the median value.

Files used: *Exp4a.c*

Output:

```
shubhan@MSI: ~/programs/C
shubhan@MSI:~/programs/OS$ gcc -pthread Exp4a.c -o ex4
shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
The maximum of the 16 values is 989430
The average of the 16 values is 69960.562500
The median of the 16 values is 1107.00
shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
The maximum of the 16 values is 989430
The median of the 16 values is 1107.00
The average of the 16 values is 69960.562500
shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
The maximum of the 16 values is 989430
The average of the 16 values is 69960.562500
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shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
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shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
The maximum of the 16 values is 989430
The median of the 16 values is 1107.00
The average of the 16 values is 69960.562500
shubhan@MSI:~/programs/OS$ ./ex4 1234 563 23412 54343 123 123 630 7894 598 34892 989430 548 3589 34 976 980
The median of the 16 values is 1107.00
The average of the 16 values is 69960.562500
The maximum of the 16 values is 989430
shubhan@MSI:~/programs/OS$
```

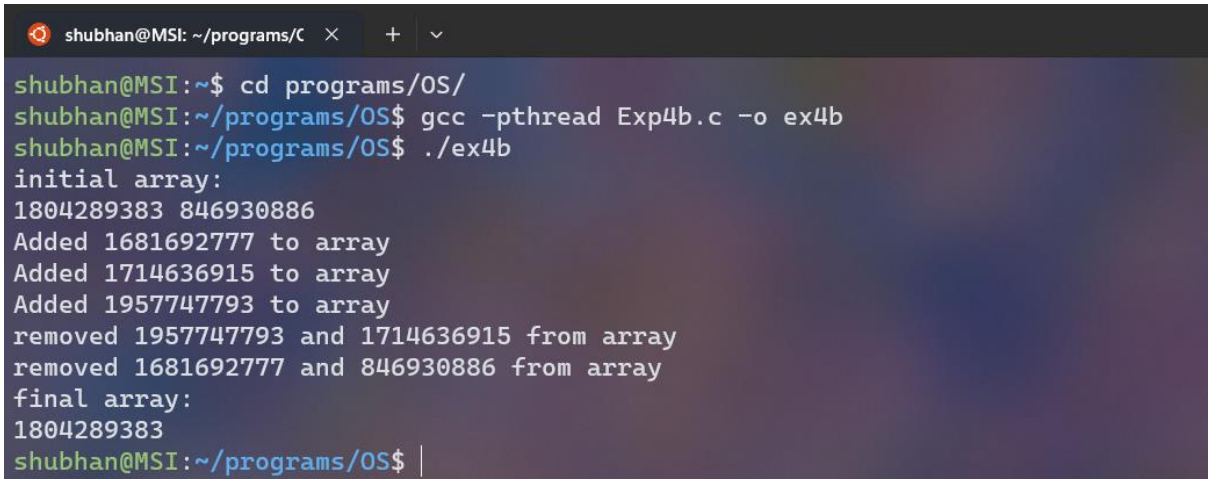
(The order of output changes for the same code)

Part 2:

Aim: Write a multithreaded program that creates two functions one for adding the element from array and other function to delete last two elements in array and print it. The code runs 5 times, addition of elements happens first and then the deletion. Check necessary conditions like minimum 2 elements remain in array.

Files used:

Exp4b.c



(Even though 3 threads are adding an element at once, use of mutex ensures that the control flow is stable)