

Assignment 3

“I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work.”

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Program 1:

```
EYeung@EricMac Assignment 3 % clang P1.c -pthread -lm -o test1
EYeung@EricMac Assignment 3 % ./test1
pi = 2.880000
Time taken = 0.000126
EYeung@EricMac Assignment 3 % clang P1.c -pthread -lm -o test1
EYeung@EricMac Assignment 3 % ./test1
pi = 3.088000
Time taken = 0.000205
EYeung@EricMac Assignment 3 % clang P1.c -pthread -lm -o test1
EYeung@EricMac Assignment 3 % ./test1
pi = 3.119600
Time taken = 0.000591
EYeung@EricMac Assignment 3 % clang P1.c -pthread -lm -o test1
EYeung@EricMac Assignment 3 % ./test1
pi = 3.143760
Time taken = 0.003234
EYeung@EricMac Assignment 3 % clang P1.c -pthread -lm -o test1
EYeung@EricMac Assignment 3 % ./test1
pi = 3.142872
Time taken = 0.030621
EYeung@EricMac Assignment 3 % █
```

With program 1, using less points meant the computer was able to compute the approximate value of pi a lot quicker, but it was less accurate. As you increased the number of points, the value of pi gets more accurate but run time increases.

Program 2:

```
EYeung@EricMac Assignment 3 % clang P2.c -pthread -lm -o test2
EYeung@EricMac Assignment 3 % ./test2
pi = 2.880000
Time taken = 0.000002
EYeung@EricMac Assignment 3 % clang P2.c -pthread -lm -o test2
EYeung@EricMac Assignment 3 % ./test2
pi = 3.088000
Time taken = 0.000003
EYeung@EricMac Assignment 3 % clang P2.c -pthread -lm -o test2
EYeung@EricMac Assignment 3 % ./test2
pi = 3.119600
Time taken = 0.000002
EYeung@EricMac Assignment 3 % clang P2.c -pthread -lm -o test2
EYeung@EricMac Assignment 3 % ./test2
^[[A
pi = 3.143760
Time taken = 0.000004
EYeung@EricMac Assignment 3 % clang P2.c -pthread -lm -o test2
EYeung@EricMac Assignment 3 % ./test2
pi = 3.142872
Time taken = 0.000002
EYeung@EricMac Assignment 3 % █
```

Since program 2 uses a multithreaded approach, the run time did not matter as it computed the value of pi very quickly. As we increased the number of points, the value of pi got more and more accurate.

Program 3:

```
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
785245
pi = 3.140980
Time taken = 0.031250
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
784987
pi = 3.139948
Time taken = 0.031250
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
785630
pi = 3.142520
Time taken = 0.031250
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
785852
pi = 3.143408
Time taken = 0.031250
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
786084
pi = 3.144336
Time taken = 0.031250
eric@DESKTOP-E06PVB6:~/projects/helloworld$ clang Assignment\3\ P3.c -pthread -lm -o test3
eric@DESKTOP-E06PVB6:~/projects/helloworld$ ./test3
```

With program 3, the speed of the program did not matter as the computer was able to execute the code quickly enough. Even with the increased number of points that needed to be checked, the computer had no problem doing it. The value of pi was close to program 1 as they had the same number of points to be checked at the end.

Program 4:

```
EYeung@EricMac Assignment 3 % clang P4.c -pthread -lm -o test4
EYeung@EricMac Assignment 3 % ./test4
pi = 3.142872
Time taken = 0.000003
EYeung@EricMac Assignment 3 % █
```

Since this is done in parallel time, it is a lot faster than any of the other programs even with 1000000 points to be checked.