Fri Feb 16 21:31:36 2018 timeStats.profile

326007706 function calls in 134.143 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 134.143 134.143 {built-in method builtins.exec}

1 0.000 0.000 134.143 134.143 nbody.py:3(<module>)

1 0.607 0.607 134.143 134.143 nbody.py:125(nbody)

2000000 28.036 0.000 133.528 0.000 nbody.py:67(advance)

20000000 35.140 0.000 95.084 0.000 nbody.py:54(update\_vs)

120000000 30.784 0.000 59.944 0.000 nbody.py:47(compute\_b)

120000000 29.160 0.000 29.160 0.000 nbody.py:51(compute\_mag)

10000000 4.023 0.000 4.023 0.000 nbody.py:62(update\_rs)

20002000 3.228 0.000 3.228 0.000 nbody.py:44(compute\_deltas)

20002000 1.784 0.000 1.784 0.000 {method 'append' of 'list' objects}

14001401 1.375 0.000 1.375 0.000 {method 'keys' of 'dict' objects}

200 0.003 0.000 0.004 0.000 nbody.py:88(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody.py:85(compute\_energy)

1 0.000 0.000 0.000 0.000 nbody.py:108(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

Fri Feb 16 21:35:15 2018 timeStats.profile

294007806 function calls in 125.330 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 125.330 125.330 {built-in method builtins.exec}

1 0.000 0.000 125.330 125.330 nbody\_1.py:3(<module>)

1 0.000 0.000 125.330 125.330 nbody\_1.py:138(nbody)

100 59.510 0.595 125.322 1.253 nbody\_1.py:68(advance)

120000000 30.479 0.000 59.410 0.000 nbody\_1.py:47(compute\_b)

120000000 28.931 0.000 28.931 0.000 nbody\_1.py:51(compute\_mag)

20002000 3.319 0.000 3.319 0.000 nbody\_1.py:44(compute\_deltas)

20002000 1.760 0.000 1.760 0.000 {method 'append' of 'list' objects}

14001401 1.325 0.000 1.325 0.000 {method 'keys' of 'dict' objects}

200 0.003 0.000 0.004 0.000 nbody\_1.py:101(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody\_1.py:98(compute\_energy)

1 0.000 0.000 0.000 0.000 nbody\_1.py:121(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

Fri Feb 16 21:38:52 2018 timeStats.profile

306005706 function calls in 127.237 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 127.237 127.237 {built-in method builtins.exec}

1 0.000 0.000 127.237 127.237 nbody\_2.py:3(<module>)

1 0.554 0.554 127.237 127.237 nbody\_2.py:127(nbody)

2000000 23.761 0.000 126.677 0.000 nbody\_2.py:67(advance)

20000000 34.736 0.000 94.508 0.000 nbody\_2.py:54(update\_vs)

120000000 30.891 0.000 59.771 0.000 nbody\_2.py:47(compute\_b)

120000000 28.880 0.000 28.880 0.000 nbody\_2.py:51(compute\_mag)

10000000 4.027 0.000 4.027 0.000 nbody\_2.py:62(update\_rs)

20002000 3.160 0.000 3.160 0.000 nbody\_2.py:44(compute\_deltas)

14001401 1.222 0.000 1.222 0.000 {method 'keys' of 'dict' objects}

200 0.003 0.000 0.004 0.000 nbody\_2.py:89(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody\_2.py:86(compute\_energy)

1 0.000 0.000 0.000 0.000 nbody\_2.py:110(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

326007706 function calls in 134.096 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 134.096 134.096 {built-in method builtins.exec}

1 0.000 0.000 134.096 134.096 nbody\_3.py:3(<module>)

1 0.608 0.608 134.096 134.096 nbody\_3.py:126(nbody)

2000000 28.545 0.000 133.481 0.000 nbody\_3.py:67(advance)

20000000 35.115 0.000 94.522 0.000 nbody\_3.py:54(update\_vs)

120000000 30.463 0.000 59.408 0.000 nbody\_3.py:47(compute\_b)

120000000 28.944 0.000 28.944 0.000 nbody\_3.py:51(compute\_mag)

10000000 3.966 0.000 3.966 0.000 nbody\_3.py:62(update\_rs)

20002000 3.262 0.000 3.262 0.000 nbody\_3.py:44(compute\_deltas)

20002000 1.800 0.000 1.800 0.000 {method 'append' of 'list' objects}

14001401 1.386 0.000 1.386 0.000 {method 'keys' of 'dict' objects}

200 0.003 0.000 0.004 0.000 nbody\_3.py:89(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody\_3.py:86(compute\_energy)

1 0.000 0.000 0.000 0.000 nbody\_3.py:109(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

314006506 function calls in 129.362 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 129.362 129.362 {built-in method builtins.exec}

1 0.000 0.000 129.362 129.362 nbody\_4.py:3(<module>)

1 0.595 0.595 129.362 129.362 nbody\_4.py:129(nbody)

2000000 25.182 0.000 128.761 0.000 nbody\_4.py:67(advance)

20000000 35.231 0.000 94.425 0.000 nbody\_4.py:54(update\_vs)

120000000 30.344 0.000 59.194 0.000 nbody\_4.py:47(compute\_b)

120000000 28.850 0.000 28.850 0.000 nbody\_4.py:51(compute\_mag)

10000000 4.000 0.000 4.000 0.000 nbody\_4.py:62(update\_rs)

20002000 3.193 0.000 3.193 0.000 nbody\_4.py:44(compute\_deltas)

20002000 1.733 0.000 1.733 0.000 {method 'append' of 'list' objects}

2000201 0.229 0.000 0.229 0.000 {method 'keys' of 'dict' objects}

200 0.003 0.000 0.004 0.000 nbody\_4.py:90(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody\_4.py:87(compute\_energy)

1 0.000 0.000 0.000 0.000 nbody\_4.py:112(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

290004706 function calls in 132.152 seconds

Ordered by: cumulative time

ncalls tottime percall cumtime percall filename:lineno(function)

1 0.000 0.000 132.152 132.152 {built-in method builtins.exec}

1 0.000 0.000 132.152 132.152 nbody\_opt.py:3(<module>)

1 0.000 0.000 132.152 132.152 nbody\_opt.py:129(nbody)

100 22.818 0.228 132.144 1.321 nbody\_opt.py:67(advance)

20000000 38.363 0.000 101.617 0.000 nbody\_opt.py:54(update\_vs)

120000000 32.283 0.000 63.255 0.000 nbody\_opt.py:47(compute\_b)

120000000 30.971 0.000 30.971 0.000 nbody\_opt.py:51(compute\_mag)

10000000 4.299 0.000 4.299 0.000 nbody\_opt.py:62(update\_rs)

20002000 3.411 0.000 3.411 0.000 nbody\_opt.py:44(compute\_deltas)

200 0.003 0.000 0.004 0.000 nbody\_opt.py:91(report\_energy)

100 0.003 0.000 0.003 0.000 {built-in method builtins.print}

2000 0.001 0.000 0.001 0.000 nbody\_opt.py:88(compute\_energy)

301 0.000 0.000 0.000 0.000 {method 'keys' of 'dict' objects}

1 0.000 0.000 0.000 0.000 nbody\_opt.py:112(offset\_momentum)

1 0.000 0.000 0.000 0.000 {method 'disable' of '\_lsprof.Profiler' objects}

I did not save that much time. My speedup was 134.143/132.152 = 1.015065984. There was probably some interference with the techniques used in the speedup.