Assignment 1 Part 2

In this assignment I ran into the problem of being unable to import pymp. I was using PyCharm to implement and run my code however I was unable to run it, I check through the python terminal to see if I had installed the module. Turns out it was installed but PyCharm was pulling something else which I still do not know. I was able to continue working by editing my code through gedit.

It took me about 5 hours to complete my assignment due to the error with PyCharm and figuring out that the more threads doesn’t necessarily mean quicker results.

I implemented the matrix multiply using 1,2,4 and 8 threads and achieved the following results with two matrices = 100\*100.

For thread=1:~ .22 second

For thread=2:~ 3.38 seconds

For thread=4:~ 3.48 seconds

For thread=8:~ 6.81 seconds

The reason I believe the threads increase in seconds especially at 8 is because of the way the work is divided up. The work seems to stop being divided equally once the threads equal 8 and therefore inefficiency starts to kick in.

The cpu info dump is as follows:

processor : 0

vendor\_id : GenuineIntel

cpu family : 6

model : 158

model name : Intel(R) Core(TM) i5-8600K CPU @ 3.60GHz

stepping : 10

microcode : 0x96

cpu MHz : 3600.002

cache size : 9216 KB

physical id : 0

siblings : 4

core id : 0

cpu cores : 4

apicid : 0

initial apicid : 0

fpu : yes

fpu\_exception : yes

cpuid level : 22

wp : yes

flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss ht syscall nx pdpe1gb rdtscp lm constant\_tsc arch\_perfmon nopl xtopology tsc\_reliable nonstop\_tsc cpuid pni pclmulqdq ssse3 fma cx16 pcid sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave avx f16c rdrand hypervisor lahf\_lm abm 3dnowprefetch cpuid\_fault invpcid\_single pti ssbd ibrs ibpb stibp fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xsaves arat flush\_l1d arch\_capabilities

bugs : cpu\_meltdown spectre\_v1 spectre\_v2 spec\_store\_bypass l1tf mds swapgs taa itlb\_multihit

bogomips : 7200.00

clflush size : 64

cache\_alignment : 64

address sizes : 43 bits physical, 48 bits virtual

power management:

processor : 1

vendor\_id : GenuineIntel

cpu family : 6

model : 158

model name : Intel(R) Core(TM) i5-8600K CPU @ 3.60GHz

stepping : 10

microcode : 0x96

cpu MHz : 3600.002

cache size : 9216 KB

physical id : 0

siblings : 4

core id : 1

cpu cores : 4

apicid : 1

initial apicid : 1

fpu : yes

fpu\_exception : yes

cpuid level : 22

wp : yes

flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss ht syscall nx pdpe1gb rdtscp lm constant\_tsc arch\_perfmon nopl xtopology tsc\_reliable nonstop\_tsc cpuid pni pclmulqdq ssse3 fma cx16 pcid sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave avx f16c rdrand hypervisor lahf\_lm abm 3dnowprefetch cpuid\_fault invpcid\_single pti ssbd ibrs ibpb stibp fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xsaves arat flush\_l1d arch\_capabilities

bugs : cpu\_meltdown spectre\_v1 spectre\_v2 spec\_store\_bypass l1tf mds swapgs taa itlb\_multihit

bogomips : 7200.00

clflush size : 64

cache\_alignment : 64

address sizes : 43 bits physical, 48 bits virtual

power management:

processor : 2

vendor\_id : GenuineIntel

cpu family : 6

model : 158

model name : Intel(R) Core(TM) i5-8600K CPU @ 3.60GHz

stepping : 10

microcode : 0x96

cpu MHz : 3600.002

cache size : 9216 KB

physical id : 0

siblings : 4

core id : 2

cpu cores : 4

apicid : 2

initial apicid : 2

fpu : yes

fpu\_exception : yes

cpuid level : 22

wp : yes

flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss ht syscall nx pdpe1gb rdtscp lm constant\_tsc arch\_perfmon nopl xtopology tsc\_reliable nonstop\_tsc cpuid pni pclmulqdq ssse3 fma cx16 pcid sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave avx f16c rdrand hypervisor lahf\_lm abm 3dnowprefetch cpuid\_fault invpcid\_single pti ssbd ibrs ibpb stibp fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xsaves arat flush\_l1d arch\_capabilities

bugs : cpu\_meltdown spectre\_v1 spectre\_v2 spec\_store\_bypass l1tf mds swapgs taa itlb\_multihit

bogomips : 7200.00

clflush size : 64

cache\_alignment : 64

address sizes : 43 bits physical, 48 bits virtual

power management:

processor : 3

vendor\_id : GenuineIntel

cpu family : 6

model : 158

model name : Intel(R) Core(TM) i5-8600K CPU @ 3.60GHz

stepping : 10

microcode : 0x96

cpu MHz : 3600.002

cache size : 9216 KB

physical id : 0

siblings : 4

core id : 3

cpu cores : 4

apicid : 3

initial apicid : 3

fpu : yes

fpu\_exception : yes

cpuid level : 22

wp : yes

flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ss ht syscall nx pdpe1gb rdtscp lm constant\_tsc arch\_perfmon nopl xtopology tsc\_reliable nonstop\_tsc cpuid pni pclmulqdq ssse3 fma cx16 pcid sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave avx f16c rdrand hypervisor lahf\_lm abm 3dnowprefetch cpuid\_fault invpcid\_single pti ssbd ibrs ibpb stibp fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xsaves arat flush\_l1d arch\_capabilities

bugs : cpu\_meltdown spectre\_v1 spectre\_v2 spec\_store\_bypass l1tf mds swapgs taa itlb\_multihit

bogomips : 7200.00

clflush size : 64

cache\_alignment : 64

address sizes : 43 bits physical, 48 bits virtual

power management: