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Geog 489-Summer 1

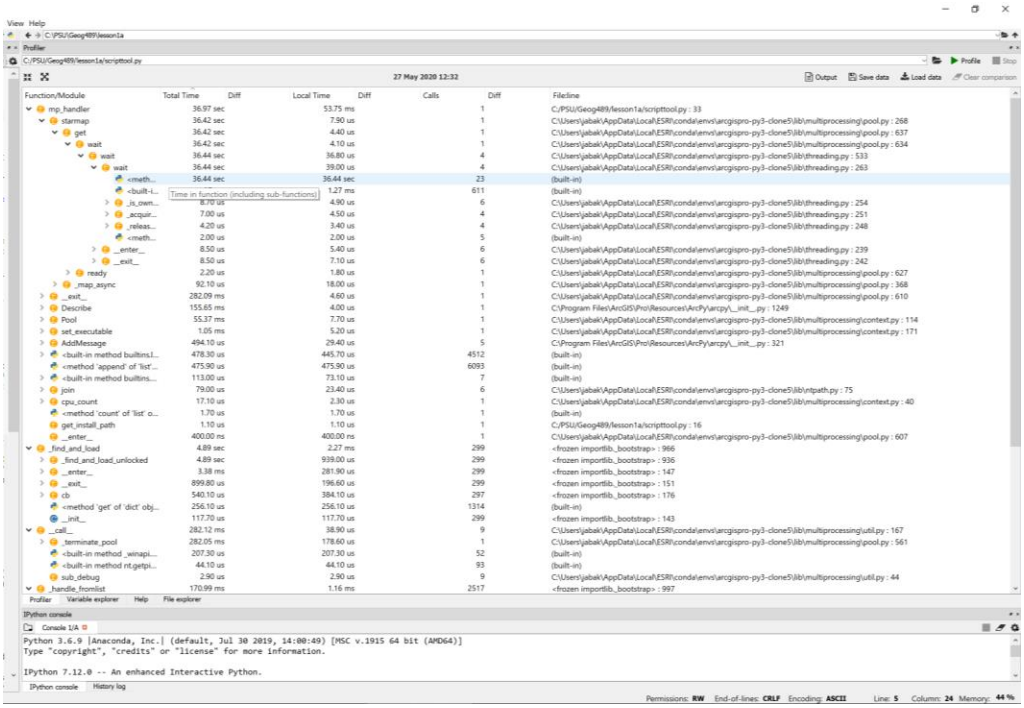
Lesson 1 Deliverable

I would have to express that every lesson has some major component that I have learned, but specifically in this case the most useful for me was the use of the multiprocessor, and reluctantly the lack of use of multithreading. The ability to designate the sequential and parallel processes would seem to be a universal part of some applications outside of arc and while the syntax might be slightly different that would be an arguably small task to tackle. In this lesson on part a I went with the most simplistic modifications to accomplish the result and subsequent toolbox, I was unsure if that was the purpose or if I had done too little, but in the spirit of government work….. As for the second part, I found the challenges were in the workers processing or rather failing. This was a relatively straightforward fix but was easy for me to miss without adding a few messages along the way.

As for the debugging and profiling: I found them both useful and frustrating and as of this writing, the third attempt at profiling the final multi_input version has been running for 20 minutes and shows no signs of life, but the code works great. The issues with the profiler were not present with the previous version of L1 so I suspect it is a known issue with spyder or multiprocessing. The Lesson 1a profile showed as expected that the bulk of time spent was waiting for the module to process the jobs. This would be a great place to further analyze which part of the worker is taking longer than others and how to compartmentalize tasks outside of the worker.

In this case for Over and Above I am uploading to github with the caveat that there were numerous opportunities to go over and above on this lesson with various name changes to files or merging the similar files into singular files etc. That being said, I spent a bit of time with the tool in ArcPro but was having failures where it was working fine in Spyder and had to alter course for time considerations.

The issue with writing to a geodatabase is that it will lock data as a function of the geodatabase, this was discussed earlier in the lesson regarding use of in-memory to circumvent this when possible.


View Help
C:\PSU\Geog489\lesson1a
Profiler
C:/PSU/Geog489/lesson1a/scripttool.py
Profile
Stop
27 May 2020 12:32
Output
Save data
Load data
Clear comparison
Function/Module
Total Time
Diff
Local Time
Diff
Calls
Diff
Fileline
mp_handler 36.97 sec 53.75 ms 1 C:/PSU/Geog489/lesson1a/scripttool.py : 33
starmap 36.42 sec 7.90 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 268
get 36.42 sec 4.40 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 637
wait 36.42 sec 4.10 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 634
wait 36.44 sec 36.80 us 4 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 533
wait 36.44 sec 39.00 us 4 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 263
<meth... 36.44 sec 36.44 sec 23 (built-in)
<built-i... Time in function (including sub-functions) 1.27 ms 611 (built-in)
_is_own... 8.70 us 4.90 us 6 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 254
_acquir... 7.00 us 4.50 us 4 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 251
_releas... 4.20 us 3.40 us 4 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 248
<meth... 2.00 us 2.00 us 5 (built-in)
__enter__ 8.50 us 5.40 us 6 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 239
__exit__ 8.50 us 7.10 us 6 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\threading.py : 242
ready 2.20 us 1.80 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 627
_map_async 92.10 us 18.00 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 368
__exit__ 282.09 ms 4.60 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 610
Describe 155.65 ms 4.00 us 1 C:\Program Files\ArcGIS\Pro\Resources\ArcPy\arcpy__init__.py : 1249
Pool 55.37 ms 7.70 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\context.py : 114
set_executable 1.05 ms 5.20 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\context.py : 171
AddMessage 494.10 us 29.40 us 5 C:\Program Files\ArcGIS\Pro\Resources\ArcPy\arcpy__init__.py : 321
<built-in method builtins.l... 478.30 us 445.70 us 4512 (built-in)
<method 'append' of 'list'... 475.90 us 475.90 us 6093 (built-in)
<built-in method builtins... 113.00 us 73.10 us 7 (built-in)
join 79.00 us 23.40 us 6 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\ntpath.py : 75
cpu_count 17.10 us 2.30 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\context.py : 40
<method 'count' of 'list' o... 1.70 us 1.70 us 1 (built-in)
get_install_path 1.10 us 1.10 us 1 C:/PSU/Geog489/lesson1a/scripttool.py : 16
__enter__ 400.00 ns 400.00 ns 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 607
_find_and_load 4.89 sec 2.27 ms 299 <frozen importlib._bootstrap> : 966
_find_and_load_unlocked 4.89 sec 939.00 us 299 <frozen importlib._bootstrap> : 936
__enter__ 3.38 ms 281.90 us 299 <frozen importlib._bootstrap> : 147
__exit__ 899.80 us 196.60 us 299 <frozen importlib._bootstrap> : 151
cb 540.10 us 384.10 us 297 <frozen importlib._bootstrap> : 176
<method 'get' of 'dict' obj... 256.10 us 256.10 us 1314 (built-in)
__init__ 117.70 us 117.70 us 299 <frozen importlib._bootstrap> : 143
__call__ 282.12 ms 38.90 us 9 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\util.py : 167
_terminate_pool 282.05 ms 178.60 us 1 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\pool.py : 561
<built-in method _winapi.... 207.30 us 207.30 us 52 (built-in)
<built-in method nt.getpi... 44.10 us 44.10 us 93 (built-in)
sub_debug 2.90 us 2.90 us 9 C:\Users\jabak\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone5\lib\multiprocessing\util.py : 44
_handle_fromlist 170.99 ms 1.16 ms 2517 <frozen importlib._bootstrap> : 997
Profiler
Variable explorer
Help
File explorer
IPython console
Console 1/A
Python 3.6.9 |Anaconda, Inc.| (default, Jul 30 2019, 14:00:49) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.
IPython 7.12.0 -- An enhanced Interactive Python.
IPython console
History log
Permissions: RW
End-of-lines: CRLF
Encoding: ASCII
Line: 5
Column: 24
Memory: 44 %