# lab3 实验报告

课程名 <u>高性能计算应用实践</u> 学期 <u>2024年秋季学期</u> 姓名 <u>陈卫喆</u> 学号 2023311F13

## 实验内容

编写一个调用fork的程序,在调用fork前初始化矩阵A、B、C,然后父子进程都调用naive gemm 完成矩阵乘实现C=A\*B+C。记录以下数据:

- a. 执行程序,查看进程对应CPU的利用率
- b. 用pstree查看进程的父子关系
- c. 用time测量程序的运行,记录cpu时间和时钟时间

### a. 进程cpu利用率截图

```
top - 19:38:24 up 1:22, 1 user, load average: 1.51, 0
Tasks: 56 total, 3 running, 53 sleeping, 0 stopped
%Cpu(s): 12.6 us, 0.1 sy, 0.0 ni, 86.9 id, 0.0 wa, 0
MiB Mem: 7840.3 total, 6382.7 free, 1124.5 used,
                                          load average: 1.51, 0.61, 0.49
                                                       je: 1.51,
0 stopped, 0 zombie
0.0 wa, 0.0 hi, 0.3 si, 0.0
0.5 used, 333.1 buff/cache
                                                                                        0.0 st
MiB Swap:
              2048.0 total,
                                  2048.0 free,
     PID USER
                      PR
                                  VIRT
                                                    SHR S %CPU %MEM
                                                                               TIME+ COMMAND
                          NI
                                           RES
                                         99644
                                                   1232 R 100.0
  35391 yushik1
                           Θ
                               101092
                                                                     1.2
                                                                            0:51.45 demo
                      20
  35399 yushik1
5078 yushik1
                                                     68 R 100.0
                                                                            0:51.27 demo
0:57.29 node
                      20
                           Θ
                               101092
                                         98480
                                                                     1.2
                                                  48908 S
                                                                     3.2
                      20
                           0
                                21.4g
                                        253020
                                                              3.0
                                                                            0:27.23 systemd
       1 root
                      20
                           0
                               165720
                                         11020
                                                   8100 S
                                                                     0.1
                                                                            0:00.17 Relay(5565)
0:00.76 node
   5564 root
                      20
                                  2520
                                           128
                                                      0 S
                                                              0.3
                                                                     0.0
   5565 yushik1
                               989716
                                                  38700 S
                      20
                                         46364
                                                              0.3
                                                                     0.6
                                                   3124 R
                                                                     0.0
                                                                            0:00.02 top
  35418 yushik1
                      20
                           0
                                  7796
                                          3724
                                                              0.3
       2 root
7 root
                                                   1384 S
                                                                            0:00.00 init-systemd(Ub
                      20
                           0
                                  2476
                                          1500
                                                              0.0
                                                                     0.0
                                                  132 S
13528 S
                                  2520
                      20
                           Θ
                                           132
                                                              0.0
                                                                     0.0
                                                                            0:00.14 init
      36 root
                      19
                                 47684
                                         14532
                                                              0.0
                                                                     0.2
                                                                            0:00.07 systemd-journal
                           Θ
                                22100
                                                   4500 S
                                                              0.0
                                                                     0.1
                                                                            0:00.24 systemd-udevd
      58 root
                                          5996
                                                                            0:00.00 snapfuse
                               152992
                                                     48 S
      72 root
                      20
                                          2244
                                                              0.0
                                                                     0.0
                                                    384 S
                                                                            0:00.54 snapfuse
      76 root
                      20
                               377284
                                         14092
                                                              0.0
                                                                     0.2
                      20
                                                     44 S
                                                                            0:00.00 snapfuse
      77 root
                           0
                               152992
                                           204
                                                              0.0
                                                                     0.0
                                                     44 S
                                                                            0:00.00 snapfuse
      85 root
                      20
                           Θ
                               153124
                                          2248
                                                              0.0
                                                                     0.0
      91 root
                      20
                           Θ
                               152992
                                           2200
                                                      4 S
                                                              0.0
                                                                     0.0
                                                                            0:00.00 snapfuse
      97 root
                      20
                           0
                                302520
                                          9112
                                                    272 S
                                                              0.0
                                                                     0.1
                                                                            0:00.09 snapfuse
                                                       4 S
                                                                            0:00.00 snapfuse
     101 root
                      20
                               152992
                                          2196
                                                              0.0
                                                                     0.0
                                                    368 S
     106 root
                      20
                               302520
                                         11584
                                                              0.0
                                                                     0.1
                                                                            0:00.84 snapfuse
                                         12444
                                                   8248 S
                                                                     0.2
                                                                            0:00.10 systemd-resolve
                      20
                                 25540
                                                              0.0
     115 systemd+
                                                              0.0
     140 root
                      20
                           Θ
                                  4308
                                          2656
                                                   2416 S
                                                                     0.0
                                                                            0:00.00 cron
                                                                            0:00.01 dbus-daemon
     141 message+
                      20
                            0
                                  8592
                                          4664
                                                   4132 S
                                                              0.0
                                                                     0.1
                                                  10316 S
                                                                     0.2
     161 root
                      20
                            Θ
                                 30108
                                         19112
                                                              0.0
                                                                            0:00.06 networkd-dispat
```

#### b. pstree截图

```
systemd-
           -2*[agetty]
           -cron
          -dbus-daemon
          -init-systemd(Ub-
                               -SessionLeader---Relay(4927)-
                                                                   -cpptools-srv-
                                                                                   -7*[{cpptools-srv}]
                                                                                          node—cpptools—25*[{cpptools}]
-node—6*[{node}]
-11*[{node}]
-node—12*[{node}]
-10*[{node}]
                                                                       —sh——sh-
                                                                                  —node·
                               -6*[{node}]
-6*[{node}]
                               -SessionLeader-
                               -init---{init}
                               -login---bash
                              -{init-systemd(Ub}
          -python3.10
                                            python3
L5*[{python3.10}]
          -subiquity-serve—
          -systemd---(sd-pam)
-systemd-journal
-systemd-logind
           -systemd-resolve
          -systemd-udevd
-unattended-und
```

#### c. 时间数据及(user + sys)/real的值

	time
real	2m17.938s
user	2m17.766s
sys	0m0.170s

(user + sys)/real	1.0024824702756847
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