

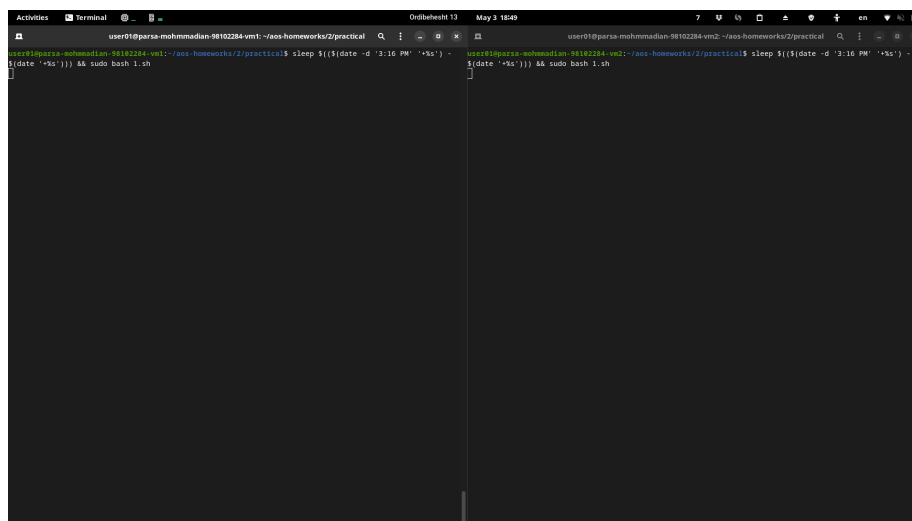
تمرین سری دوم درس سیستم‌های عامل پیشرفته

پارسا محمدیان – ۹۸۱۰۲۲۸۴

۱۴ اردیبهشت ۱۴۰۲

۱

کد مربوط به این بخش در فایل 1.c موجود است. اسکریپت اجرای آن نیز در فایل 1.sh موجود است. اسکریپت همانطور که در تصاویر زیر نشان داده شده، اجرا می‌شود. مقدار sleep ای که قبل از دستور قرار داده شده است، برای این است که اسکریپت به صورت همزمان در هر دو ماشین اجرا شوند. (دقت شود که ساعت سیستم با ساعت دو ماشین هماهنگ نیست ولی ساعت دو ماشین با هم هماهنگ است)



```
user01@parsa-mohammadian-98102284-vm1: /aos-homeworks/2/practical$ sleep $(date -d '3:16 PM' +%s) -
$(date +%s )) && sudo bash 1.sh

user01@parsa-mohammadian-98102284-vm2: /aos-homeworks/2/practical$ sleep $(date -d '3:16 PM' +%s) -
$(date +%s )) && sudo bash 1.sh
```

```
Activities Terminal OnBehesht 10 May 3 16:51
user01@parsa-mohmmadian-98102284-vm1:~/aos-homeworks/2/practical$ sleep $(($(date -d '3:16 PM' +%s') - $(date +%s))) && sudo bash 1.sh
Running 1 with 1 threads
Performance counter stats for './1 1':
    66      page-faults
    1,351    cache-misses
    208,631  dTLB-load-misses # 2.30% of all dTLB cache hits
    9,083,608 dTLB-loads
    9,959,871 dTLB-stores
    0.103882603 seconds time elapsed
    0.068069000 seconds user
    0.036036000 seconds sys

-----
Running 1 with 2 threads
Performance counter stats for './1 2':
    68      page-faults
    1,088    cache-misses
    412,309  dTLB-load-misses # 2.30% of all dTLB cache hits
    17,938,345 dTLB-loads
    19,776,989 dTLB-stores
    0.100759692 seconds time elapsed
    0.114487000 seconds user
    0.082904000 seconds sys

user01@parsa-mohmmadian-98102284-vm1:~/aos-homeworks/2/practical$

user01@parsa-mohmmadian-98102284-vm2:~/aos-homeworks/2/practical$ sleep $(($(date -d '3:16 PM' +%s') - $(date +%s))) && sudo bash 1.sh
Running 1 with 1 threads
Performance counter stats for './1 1':
    63      page-faults
    1,570    cache-misses
    208,701  dTLB-load-misses # 2.29% of all dTLB cache hits
    9,096,343 dTLB-loads
    9,968,360 dTLB-stores
    0.103917866 seconds time elapsed
    0.060072000 seconds user
    0.044052000 seconds sys

-----
Running 1 with 2 threads
Performance counter stats for './1 2':
    64      page-faults
    1,078    cache-misses
    412,514  dTLB-load-misses # 2.30% of all dTLB cache hits
    17,932,761 dTLB-loads
    19,708,259 dTLB-stores
    0.106430098 seconds time elapsed
    0.121090000 seconds user
    0.084763000 seconds sys

user01@parsa-mohmmadian-98102284-vm2:~/aos-homeworks/2/practical$
```

۱.۱

آمار در ماشین مجازی اول به صورت زیر است.

Running 1 with 1 threads

```
Performance counter stats for './1 1':
    66      page-faults
    1,351    cache-misses
    208,631  dTLB-load-misses # 2.30% of all dTLB cache hits
    9,083,608 dTLB-loads
    9,959,871 dTLB-stores
    0.103882603 seconds time elapsed
    0.068069000 seconds user
    0.036036000 seconds sys
```

Running 1 with 2 threads

```
Performance counter stats for './1 2':
    68      page-faults
    1,088    cache-misses
    412,309  dTLB-load-misses # 2.30% of all dTLB cache hits
    17,938,345 dTLB-loads
    19,776,989 dTLB-stores
    0.100759692 seconds time elapsed
    0.114487000 seconds user
    0.082904000 seconds sys
```

آمار در ماشین مجازی دوم به صورت زیر است.

Running 1 with 1 threads

```
Performance counter stats for './1 1':
    63      page-faults
    1,570    cache-misses
    208,701  dTLB-load-misses # 2.29% of all dTLB cache hits
    9,096,343 dTLB-loads
    9,968,360 dTLB-stores
    0.103917866 seconds time elapsed
    0.060072000 seconds user
    0.044052000 seconds sys
```



```
329,574      dTLB-loads
171,898      dTLB-stores

0.003173850 seconds time elapsed

0.001373000 seconds user
0.000000000 seconds sys

Running 2 with ASYNC

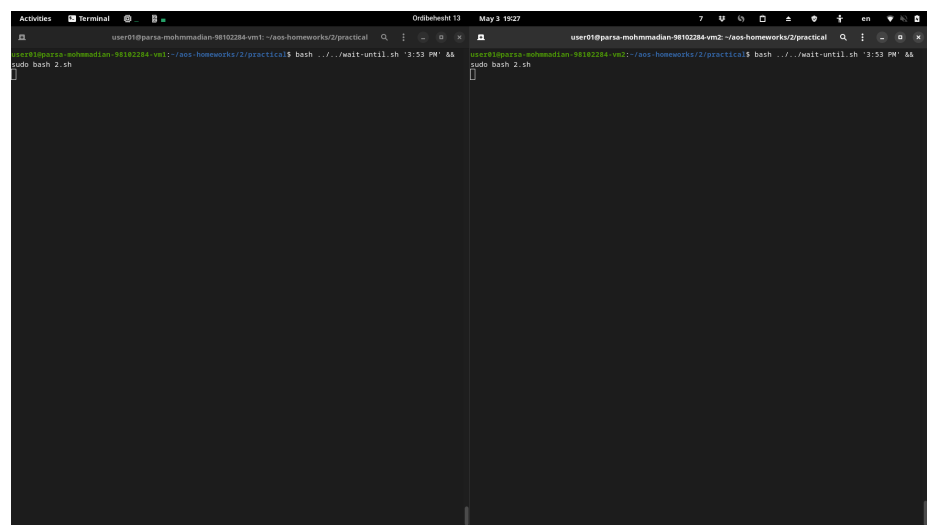
Performance counter stats for './2 ASYNC':

      62      page-faults
    24,961      cache-misses
      1,269      dTLB-load-misses          #    0.41% of all dTLB cache accesses
    306,500      dTLB-loads
    156,641      dTLB-stores

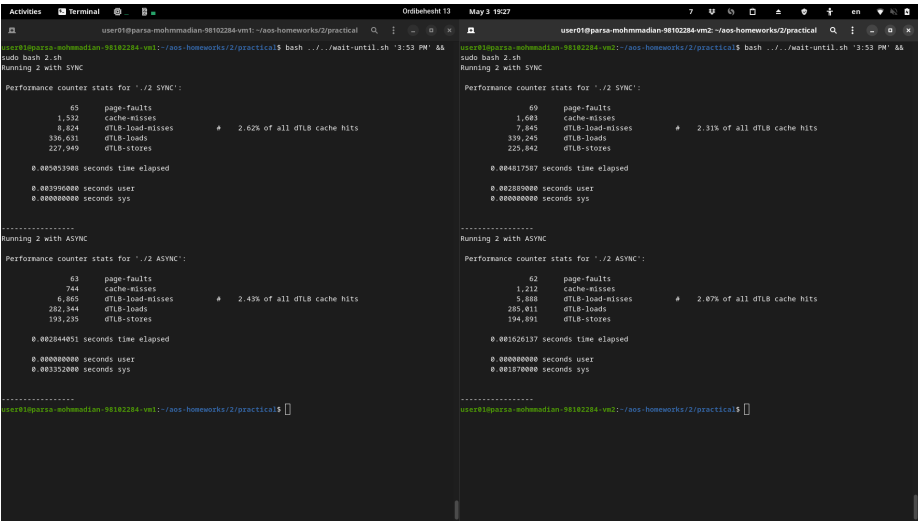
0.000946218 seconds time elapsed

0.000997000 seconds user
0.000000000 seconds sys
```

۲.۲



۴



آمار در ماشین مجازی اول به صورت زیر است.

Running 2 with SYNC

```
Performance counter stats for './2 SYNC':

        65      page-faults
    1,532      cache-misses
    8,824      dTLB-load-misses      #    2.62% of all dTLB cache hits
   336,631      dTLB-loads
    227,949      dTLB-stores

    0.005053908 seconds time elapsed

    0.003996000 seconds user
    0.000000000 seconds sys
```

Running 2 with ASYNC

```
Performance counter stats for './2 ASYNC':

        63      page-faults
        744      cache-misses
    6,865      dTLB-load-misses      #    2.43% of all dTLB cache hits
   282,344      dTLB-loads
    193,235      dTLB-stores

    0.002844051 seconds time elapsed

    0.000000000 seconds user
    0.003352000 seconds sys
```

آمار در ماشین مجازی دوم به صورت زیر است.

Running 2 with SYNC

```
Performance counter stats for './2 SYNC':

        69      page-faults
    1,603      cache-misses
    7,845      dTLB-load-misses      #    2.31% of all dTLB cache hits
   339,245      dTLB-loads
    225,842      dTLB-stores

    0.004817587 seconds time elapsed

    0.002889000 seconds user
    0.000000000 seconds sys
```

Running 2 with ASYNC

```

Performance counter stats for './2 ASYNC':

        62      page-faults
       1,212    cache-misses
       5,888    dTLB-load-misses      #    2.07% of all dTLB cache hits
      285,011   dTLB-loads
      194,891   dTLB-stores

0.001626137 seconds time elapsed

0.000000000 seconds user
0.001870000 seconds sys

```

۳.۲

TODO

۴.۲

همانطور که در خروجی های قسمت الف و ب مشاهده می کنیم، برنامه یک بار برای MS_ASYNC نیز اجرا شده.

TODO

۳

این قسمت کدی به زبان C ندارد. اسکریپت مربوط به این قسمت در فایل 3.sh می باشد.

۱.۳

ابتدا اسکریپت را روی سیستم خودم اجرا کردم.

```

Activities Terminal 0h10m56s 14 May 4 1945
parsa@pcos-manjaro:~/Documents/aos-homeworks/2/practical

510,139 dTLB-load-misses # 0.00% of all dTLB cache accesses
141,000,986,533 dTLB-loads
82,691,243,296 dTLB-stores

30.002024177 seconds time elapsed

213.038211000 seconds user
0.195070000 seconds sys

stress with --vm 4 and --vm-bytes 512M for 30 seconds
stress: info: [10241] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd
stress: info: [10241] successful run completed in 30s

Performance counter stats for 'stress --vm 4 --vm-bytes 512M --timeout 30':

    601,683      page-faults
   10,564,193,883 cache-misses
    2,414,172    dTLB-load-misses      #  0.07% of all dTLB cache accesses
    2,908,347,700 dTLB-loads
    1,723,226,183 dTLB-stores

30.004263060 seconds time elapsed

3.449375000 seconds user
115.788460000 seconds sys

stress with --io 5 for 30 seconds
stress: info: [18279] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd
stress: info: [18279] successful run completed in 30s

Performance counter stats for 'stress --io 5 --timeout 30':

    141      page-faults
   35,276,123 cache-misses
    3,687,164    dTLB-load-misses      #  0.03% of all dTLB cache accesses
   14,634,298,981 dTLB-loads
   10,328,414,193 dTLB-stores

30.001919662 seconds time elapsed

0.574676000 seconds user
129.129620000 seconds sys

```

خروجی به صورت زیر است.

```

Running 3.sh
Stress with --cpu 10 for 30 seconds
stress: info: [18111] dispatching hogs: 10 cpu, 0 io, 0 vm, 0 hdd
7stress: info: [18111] successful run completed in 30s

Performance counter stats for 'stress --cpu 10 --timeout 30':

          254      page-faults
      8,402,004      cache-misses
          516,139      dTLB-load-misses          #    0.00% of all dTLB cache accesses
    141,800,586,533      dTLB-loads
      82,091,243,296      dTLB-stores

      30.002024177 seconds time elapsed

      233.838281000 seconds user
        0.195070000 seconds sys

Stress with --vm 4 and --vm-bytes 512M for 30 seconds
stress: info: [18241] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd
stress: info: [18241] successful run completed in 30s

Performance counter stats for 'stress --vm 4 --vm-bytes 512M --timeout 30':

          601,603      page-faults
    10,564,193,883      cache-misses
          2,114,172      dTLB-load-misses          #    0.07% of all dTLB cache accesses
      2,988,347,700      dTLB-loads
      1,723,228,183      dTLB-stores

      30.004263068 seconds time elapsed

      3.449375000 seconds user
     115.738466000 seconds sys

Stress with --io 5 for 30 seconds
stress: info: [18279] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd
stress: info: [18279] successful run completed in 30s

Performance counter stats for 'stress --io 5 --timeout 30':

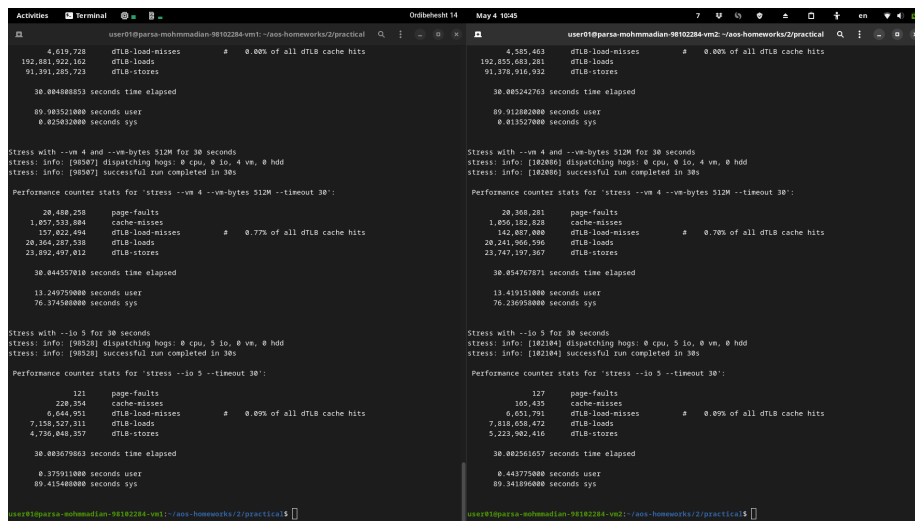
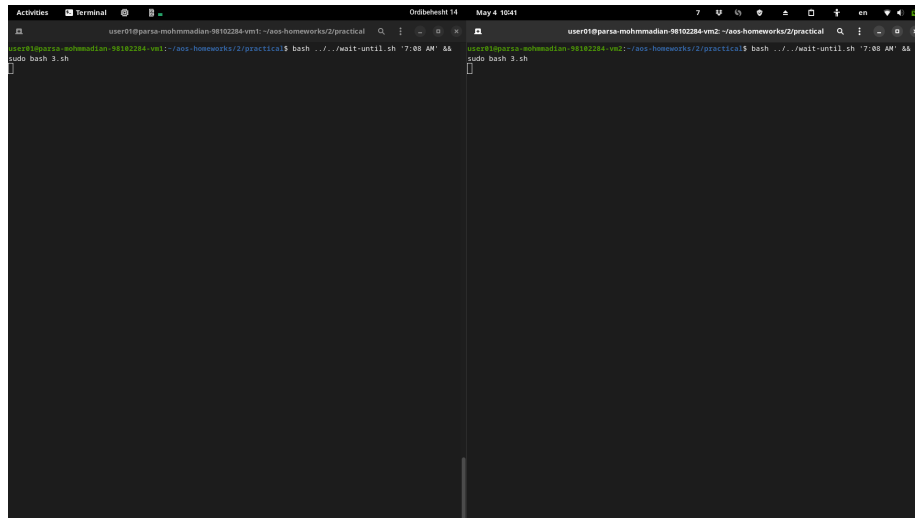
          141      page-faults
      35,274,133      cache-misses
          3,887,164      dTLB-load-misses          #    0.03% of all dTLB cache accesses
    14,634,290,981      dTLB-loads
    10,328,414,193      dTLB-stores

      30.001919662 seconds time elapsed

        0.574676000 seconds user
    125.129620000 seconds sys

```

۲.۳



آمار در ماشین مجازی اول به صورت زیر است.

Running 3.sh
Stress with —cpu 10 for 30 seconds
stress: info: [98481] dispatching hogs: 10 cpu, 0 io, 0 vm, 0 hdd
stress: info: [98481] successful run completed in 30s

Performance counter stats for 'stress —cpu 10 —timeout 30':

199	page-faults		
175,131	cache-misses		
4,619,728	dTLB-load-misses	#	0.00% of all dTLB cache hits
192,881,922,162	dTLB-loads		
91,391,285,723	dTLB-stores		

۸


```

30.004808853 seconds time elapsed

89.903521000 seconds user
0.025032000 seconds sys

Stress with --vm 4 and --vm-bytes 512M for 30 seconds
stress: info: [98507] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd
stress: info: [98507] successful run completed in 30s

Performance counter stats for 'stress --vm 4 --vm-bytes 512M --timeout 30':

    20,480,258      page-faults
    1,057,533,804   cache-misses
    157,022,494     dTLB-load-misses      #    0.77% of all dTLB cache hits
    20,364,287,538   dTLB-loads
    23,892,497,012   dTLB-stores

    30.044557010 seconds time elapsed

    13.249759000 seconds user
    76.374508000 seconds sys

Stress with --io 5 for 30 seconds
stress: info: [98528] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd
stress: info: [98528] successful run completed in 30s

Performance counter stats for 'stress --io 5 --timeout 30':

    121             page-faults
    220,354          cache-misses
    6,644,951        dTLB-load-misses      #    0.09% of all dTLB cache hits
    7,158,527,311    dTLB-loads
    4,736,048,357    dTLB-stores

    30.003679863 seconds time elapsed

    0.375911000 seconds user
    89.415408000 seconds sys

```

آمار در ماشین مجازی دوم به صورت زیر است.

```

Running 3.sh
Stress with --cpu 10 for 30 seconds
stress: info: [102060] dispatching hogs: 10 cpu, 0 io, 0 vm, 0 hdd
stress: info: [102060] successful run completed in 30s

Performance counter stats for 'stress --cpu 10 --timeout 30':

    198             page-faults
    269,601          cache-misses
    4,585,463        dTLB-load-misses      #    0.00% of all dTLB cache hits
    192,855,683,281  dTLB-loads
    91,378,916,932   dTLB-stores

    30.005242763 seconds time elapsed

    89.912802000 seconds user
    0.013527000 seconds sys

Stress with --vm 4 and --vm-bytes 512M for 30 seconds
stress: info: [102086] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd
stress: info: [102086] successful run completed in 30s

Performance counter stats for 'stress --vm 4 --vm-bytes 512M --timeout 30':

    20,368,281      page-faults
    1,056,182,828   cache-misses
    142,087,000     dTLB-load-misses      #    0.70% of all dTLB cache hits
    20,241,966,596   dTLB-loads
    23,747,197,367   dTLB-stores

    30.054767871 seconds time elapsed

    13.419151000 seconds user
    76.236958000 seconds sys

Stress with --io 5 for 30 seconds
stress: info: [102104] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd
stress: info: [102104] successful run completed in 30s

Performance counter stats for 'stress --io 5 --timeout 30':

    127             page-faults
    165,435          cache-misses
    6,651,791        dTLB-load-misses      #    0.09% of all dTLB cache hits

```

7,818,658,472 dTLB-loads
5,223,902,416 dTLB-stores

30.002561657 seconds time elapsed

0.443775000 seconds user
89.341896000 seconds sys

۳.۳
TODO