

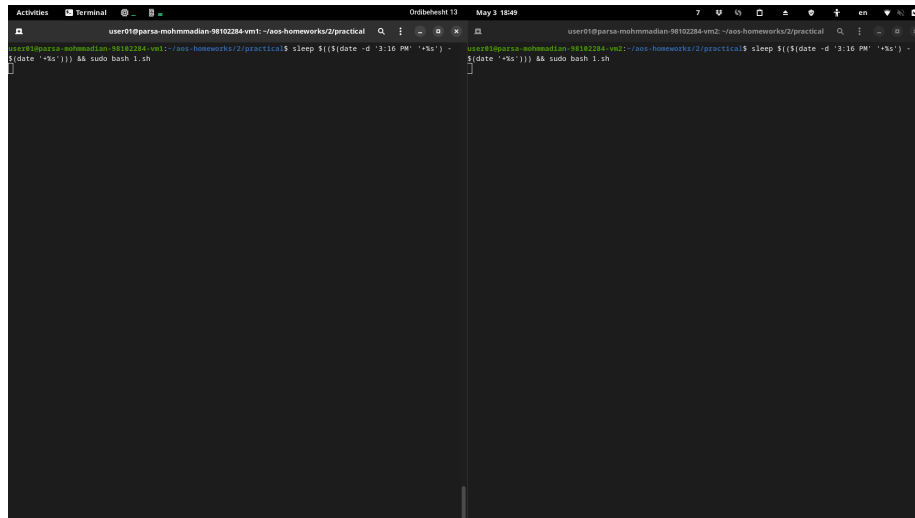
## تمرین سری دوم درس سیستم‌های عامل پیشرفته

پارسا محمدیان – ۹۸۱۰۲۲۸۴

۱۳ اردیبهشت ۱۴۰۲

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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@para-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
    0.186438098 seconds time elapsed
    0.114457000 seconds user
    0.082384000 seconds sys

user01@para-mohmmadian-98102284-vm1:~/aos-homeworks/2/practical$
user01@para-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
    1,178   cache-misses
    208,781 dTLB-load-misses # 2.29% of all dTLB cache hits
    9,086,343 dTLB-loads
    9,969,368 dTLB-stores
    0.103917866 seconds time elapsed
    0.068072000 seconds user
    0.044023000 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
    19,788,259 dTLB-stores
    0.186438098 seconds time elapsed
    0.114457000 seconds user
    0.082384000 seconds sys

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

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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 h
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 h
17,932,761	dTLB-loads		
19,780,259	dTLB-stores		

0.106430090 seconds time elapsed

0.121090000 seconds user

0.084763000 seconds sys

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TODO

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ابتدا این برنامه را بر روی سیستم خودم اجرا کردم.

```

Activities Terminal 0
Orlbeheh13 May 3 19:23
parisa@asus-manjaro:~/Documents/aos-homeworks/2/practical
$ ./2 SYNC
Running 2 with SYNC
Performance counter stats for './2 SYNC':
      67      page-faults
 66,468      cache-misses
    1,726      dTLB-load-misses      # 0.52% of all dTLB cache accesses
 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
    1,200      dTLB-load-misses      # 0.41% of all dTLB cache accesses
 306,500      dTLB-loads
 150,641      dTLB-stores

    0.000940218 seconds time elapsed
    0.000997000 seconds user
    0.000000000 seconds sys
  
```

نتایج به صورت زیر هستند.

Running 2 with SYNC

Performance counter stats for './2 SYNC':

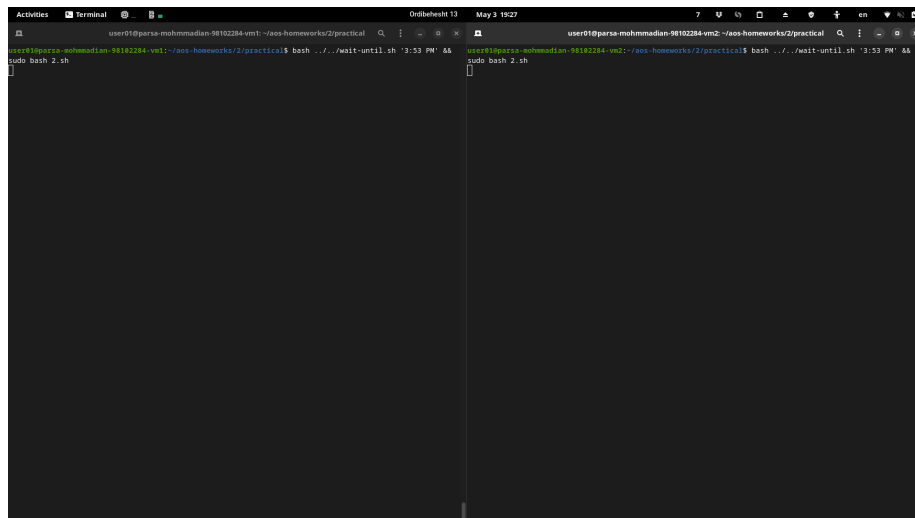
67	page-faults	
66,468	cache-misses	
1,726	dTLB-load-misses	#
0.52%	of all dTLB cache accesses	
329,574	dTLB-loads	
171,898	dTLB-stores	
0.003173850 seconds time elapsed		
0.001373000 seconds user		
0.000000000 seconds sys		

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			

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```
Activities Terminal OnBehesht 13 May 3 19:27
user01@para-mohmmadian-98102284-vm1:~/aos-homeworks/2/practical$ ./2 SYNC
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
0.003020000 seconds sys

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

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
339,245	dTLB-loads		
225,842	dTLB-stores		

0.004817587 seconds time elapsed

0.002889000 seconds user

0.000000000 seconds sys

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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
285,011	dTLB-loads		
194,891	dTLB-stores		

0.001626137 seconds time elapsed

0.000000000 seconds user

0.001870000 seconds sys

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

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```
Activities Terminal 13 May 3 19:44
parisa@asus-manjaro:~/Documents/aos-homeworks/2/practical

40,139 dTLB-load-misses # 0.00% of all dTLB cache accesses
14,601,481,747 dTLB-loads
8,453,054,195 dTLB-stores
3.002095545 seconds time elapsed
21.720410800 seconds user
0.000000000 seconds sys

Stress with --vm 4 and --vm-bytes 512M for 3 seconds
stress: info: [15837] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd
stress: info: [15837] successful run completed in 3s

Performance counter stats for 'stress --vm 4 --vm-bytes 512M --timeout 3':
   67,552      page-faults
  1,168,546,994 cache-misses
   189,917      dTLB-load-misses # 0.00% of all dTLB cache accesses
   333,679,196 dTLB-loads
   192,906,882 dTLB-stores
   3.003246134 seconds time elapsed
   0.348566000 seconds user
  11.572867000 seconds sys

Stress with --io 5 for 3 seconds
stress: info: [15847] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd
stress: info: [15847] successful run completed in 3s

Performance counter stats for 'stress --io 5 --timeout 3':
    152      page-faults
   456,272 cache-misses
  1,678,624,471 dTLB-load-misses # 0.02% of all dTLB cache accesses
  1,184,417,684 dTLB-loads
   3.001386920 seconds time elapsed
   0.056395000 seconds user
  12.314625000 seconds sys
```

خروجی به صورت زیر است.

Running 3.sh

Stress with —cpu 10 for 3 seconds

stress: info: [15825] dispatching hogs: 10 cpu, 0 io, 0 vm, 0 hdd

stress: info: [15825] successful run completed in 3s

Performance counter stats for 'stress —cpu 10 —timeout 3':

249	page-faults	
424,524	cache-misses	
40,139	dTLB-load-misses	#
0.00%	of all dTLB cache accesses	
14,601,481,747	dTLB-loads	
8,453,054,195	dTLB-stores	

3.002095545 seconds time elapsed

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23.729431000 seconds user  
0.000000000 seconds sys

Stress with `—vm 4` and `—vm-bytes 512M` for 3 seconds  
stress: info: [15837] dispatching hogs: 0 cpu, 0 io, 4 vm, 0 hdd  
stress: info: [15837] successful run completed in 3s

Performance counter stats for 'stress `—vm 4 —vm-bytes 512M —timeout 3`':

67,552	page-faults	
1,168,546,994	cache-misses	
189,917	dTLB-load-misses	#
0.06%	of all dTLB cache accesses	
333,679,196	dTLB-loads	
192,506,882	dTLB-stores	

3.003246134 seconds time elapsed

0.348566000 seconds user  
11.572867000 seconds sys

Stress with `—io 5` for 3 seconds  
stress: info: [15847] dispatching hogs: 0 cpu, 5 io, 0 vm, 0 hdd  
stress: info: [15847] successful run completed in 3s

Performance counter stats for 'stress `—io 5 —timeout 3`':

152	page-faults	
456,272	cache-misses	
295,050	dTLB-load-misses	#
0.02%	of all dTLB cache accesses	
1,678,024,471	dTLB-loads	
1,184,417,634	dTLB-stores	

3.001306920 seconds time elapsed

0.056395000 seconds user  
12.314625000 seconds sys

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