

تمرین سری اول درس سیستم‌های عامل پیشرفته

پارسا محمدیان – ۹۸۱۰۲۲۸۴

۲۴ فروردین ۱۴۰۲

تئوری

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عملی

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کد مربوط به این بخش در فایل 1.1.c موجود است. همچنین اسکریپت اجرای آن در فایل 1.1.sh قرار دارد.
در تصویر زیر مشاهده می‌کنیم که اسکریپت اجرا شده است. خروجی کامل اسکریپت را در ادامه می‌بینیم.

```

Activities Terminal Apr 13 03:46
parsi.mohammadian.981022@ ~ - ssh - Documents/aos-homeworks/1/practical - P master 1.1.1 - bash 1.1.1h

Running 1.1
Running with page size 4096
Compiling with page size 4096
Running alef
thread_a: allocating 4096B memory
thread_a: allocated 4096B memory
thread_d: reading shared pointer
thread_d: hello world
thread_d: read shared pointer
thread_b: protecting shared pointer from read
thread_b: protected shared pointer from read
thread_c: reading shared pointer
thread_c: hello world
thread_c: read shared pointer

Performance counter stats for './1.1 alef':
        65      page-faults:u
       332      dTLB-load-misses:u      #  0.89% of all dTLB cache accesses
      37,425      dTLB-loads:u
       14,689      dTLB-stores:u

0.001628487 seconds time elapsed

0.001765000 seconds user
0.0000000 seconds sys

-----
Running be
thread_a: allocating 4096B memory
thread_a: allocated 4096B memory
thread_c: reading shared pointer
thread_c: hello world
thread_b: protecting shared pointer from read
thread_d: writing to shared pointer
thread_c: read shared pointer
thread_b: protected shared pointer from read
./1.1: Segmentation fault

Performance counter stats for './1.1 be':
        64      page-faults:u
       364      dTLB-load-misses:u      #  0.84% of all dTLB cache accesses
      36,375      dTLB-loads:u
       14,857      dTLB-stores:u

```

شکل ۱: خروجی اجرای اسکریپت

Running 1.1
Running with page size 4096
Compiling with page size 4096
Running alef
thread_a: allocating 4096B memory
thread_a: allocated 4096B memory
thread_d: reading shared pointer
thread_d: hello world
thread_d: read shared pointer
thread_b: protecting shared pointer from read
thread_b: protected shared pointer from read
thread_c: reading shared pointer
thread_c: hello world
thread_c: read shared pointer

Performance counter stats for './1.1 alef':

65	page-faults:u	
332	dTLB-load-misses:u	#
0.89% of all dTLB cache accesses		
37,425	dTLB-loads:u	
14,689	dTLB-stores:u	

0.001628487 seconds time elapsed

0.001765000 seconds user

0.000000000 seconds sys

Running be

thread_a: allocating 4096B memory
thread_a: allocated 4096B memory
thread_c: reading shared pointer
thread_c: hello world
thread_b: protecting shared pointer from read
thread_d: writing to shared pointer
thread_c: read shared pointer
thread_b: protected shared pointer from read
./1.1: Segmentation fault

Performance counter stats for './1.1 be':

	64	page-faults:u	
	304	dTLB-load-misses:u	#
0.84% of all dTLB cache accesses			
	36,375	dTLB-loads:u	
	14,057	dTLB-stores:u	

0.158606399 seconds time elapsed

0.000000000 seconds user

0.012408000 seconds sys

Running jim

thread_a: allocating 4096B memory
thread_a: allocated 4096B memory
thread_d: writing to shared pointer
thread_d: wrote to shared pointer
thread_b: protecting shared pointer from read
thread_c: writing to shared pointer
thread_b: protected shared pointer from read
./1.1: Segmentation fault

Performance counter stats for './1.1 jim':

	62	page-faults:u	
	332	dTLB-load-misses:u	#
0.92% of all dTLB cache accesses			
	36,252	dTLB-loads:u	

```

13,943      dTLB-stores:u

0.124682004 seconds time elapsed

0.000000000 seconds user
0.009419000 seconds sys

```

```

Running with page size 1024
Compiling with page size 1024
Running alef
thread_a: allocating 1024B memory
thread_a: allocated 1024B memory
thread_d: reading shared pointer
thread_d: hello world
thread_d: read shared pointer
thread_b: protecting shared pointer from read
thread_c: reading shared pointer
thread_c: hello world
thread_c: read shared pointer
thread_b: protected shared pointer from read

```

Performance counter stats for './1.1 alef':

```

           63      page-faults:u
          354      dTLB-load-misses:u      #
0.95% of all dTLB cache accesses
          37,429      dTLB-loads:u
          14,711      dTLB-stores:u

```

```

0.001630073 seconds time elapsed

0.000000000 seconds user
0.001795000 seconds sys

```

```

Running be
thread_a: allocating 1024B memory
thread_a: allocated 1024B memory
thread_d: writing to shared pointer
thread_d: wrote to shared pointer
thread_b: protecting shared pointer from read
thread_b: protected shared pointer from read
thread_c: reading shared pointer

```

```
thread_c: thread_d was here
thread_c: read shared pointer
```

Performance counter stats for './1.1 be':

	64	page-faults:u	
	331	dTLB-load-misses:u	#
0.89% of all dTLB cache accesses			
	37,251	dTLB-loads:u	
	14,555	dTLB-stores:u	

0.001191988 seconds time elapsed

0.000000000 seconds user

0.001367000 seconds sys

Running jim

```
thread_a: allocating 1024B memory
thread_a: allocated 1024B memory
thread_c: writing to shared pointer
thread_c: wrote to shared pointer
thread_b: protecting shared pointer from read
thread_b: protected shared pointer from read
thread_d: writing to shared pointer
./1.1: Segmentation fault
```

Performance counter stats for './1.1 jim':

	67	page-faults:u	
	324	dTLB-load-misses:u	#
0.90% of all dTLB cache accesses			
	36,151	dTLB-loads:u	
	13,968	dTLB-stores:u	

0.124665005 seconds time elapsed

0.000000000 seconds user

0.008697000 seconds sys

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کد مربوط به این بخش در فایل 1.3.c قرار دارد. همچنین اسکریپت اجرای آن در فایل 1.3.sh قرار دارد.
در تصویر ۲ مشاهده می‌کنیم که این اسکریپت اجرا شده است. خروجی آن را در ادامه می‌بینیم.

```
Activities Terminal Apr 13 02:48 bash 1.3.sh
porsa-mohammadian@1922284: ~$ cd ~/Documents/aas-homeworks/1/practical
porsa-mohammadian@1922284: ~/Documents/aas-homeworks/1/practical$ ./1.3.sh
Running 1.3 with 1 threads
Performance counter stats for './1.3':
    53      page-faults:u
   6,313    cache-misses:u          # 0.52% of all dTLB cache accesses
    167     dTLB-load-misses:u
   31,950   dTLB-loads:u
   11,341   dTLB-stores:u

    0.000851952 seconds time elapsed
    0.00007000 seconds user
    0.00000000 seconds sys

-----
Running 1.3 with 2 threads
Performance counter stats for './1.3':
    51      page-faults:u
   6,206    cache-misses:u          # 0.50% of all dTLB cache accesses
    159     dTLB-load-misses:u
   31,950   dTLB-loads:u
   11,341   dTLB-stores:u

    0.000706024 seconds time elapsed
    0.00011000 seconds user
    0.00000000 seconds sys

-----
Running 1.3 with 3 threads
Performance counter stats for './1.3':
    53      page-faults:u
   5,643    cache-misses:u          # 0.51% of all dTLB cache accesses
    164     dTLB-load-misses:u
   31,950   dTLB-loads:u
   11,341   dTLB-stores:u

    0.000740116 seconds time elapsed
    0.00010000 seconds user
```

شکل ۲: خروجی اجرای اسکریپت

Running 1.3 with 1 threads

Performance counter stats for './1.3':

53	page-faults:u	
6,313	cache-misses:u	
167	dTLB-load-misses:u	#
0.52%	of all dTLB cache accesses	
31,950	dTLB-loads:u	
11,341	dTLB-stores:u	
0.000851952	seconds time elapsed	

```
0.000867000 seconds user
0.000000000 seconds sys
```

Running 1.3 with 2 threads

Performance counter stats for './1.3':

51	page-faults:u	
6,226	cache-misses:u	
159	dTLB-load-misses:u	#
0.50%	of all dTLB cache accesses	
31,950	dTLB-loads:u	
11,341	dTLB-stores:u	

0.000786024 seconds time elapsed

```
0.000811000 seconds user
0.000000000 seconds sys
```

Running 1.3 with 3 threads

Performance counter stats for './1.3':

53	page-faults:u	
5,643	cache-misses:u	
164	dTLB-load-misses:u	#
0.51%	of all dTLB cache accesses	
31,950	dTLB-loads:u	
11,341	dTLB-stores:u	

0.000748116 seconds time elapsed

```
0.000756000 seconds user
0.000000000 seconds sys
```

Running 1.3 with 4 threads

Performance counter stats for './1.3':

	53	page-faults:u	
	5,510	cache-misses:u	
	157	dTLB-load-misses:u	#
0.49% of all dTLB cache accesses			
	31,921	dTLB-loads:u	
	11,341	dTLB-stores:u	

0.001029236 seconds time elapsed

0.001070000 seconds user

0.000000000 seconds sys

Running 1.3 with 5 threads

Performance counter stats for './1.3':

	52	page-faults:u	
	5,868	cache-misses:u	
	159	dTLB-load-misses:u	#
0.50% of all dTLB cache accesses			
	31,950	dTLB-loads:u	
	11,341	dTLB-stores:u	

0.000757058 seconds time elapsed

0.000747000 seconds user

0.000000000 seconds sys

Running 1.3 with 6 threads

Performance counter stats for './1.3':

	51	page-faults:u	
	6,439	cache-misses:u	
	162	dTLB-load-misses:u	#
0.51% of all dTLB cache accesses			
	31,950	dTLB-loads:u	
	11,341	dTLB-stores:u	

0.000781736 seconds time elapsed

0.000827000 seconds user

0.000000000 seconds sys

Running 1.3 with 7 threads

Performance counter stats for './1.3':

52	page-faults:u	
3,688	cache-misses:u	
161	dTLB-load-misses:u	#
0.50%	of all dTLB cache accesses	
31,950	dTLB-loads:u	
11,341	dTLB-stores:u	

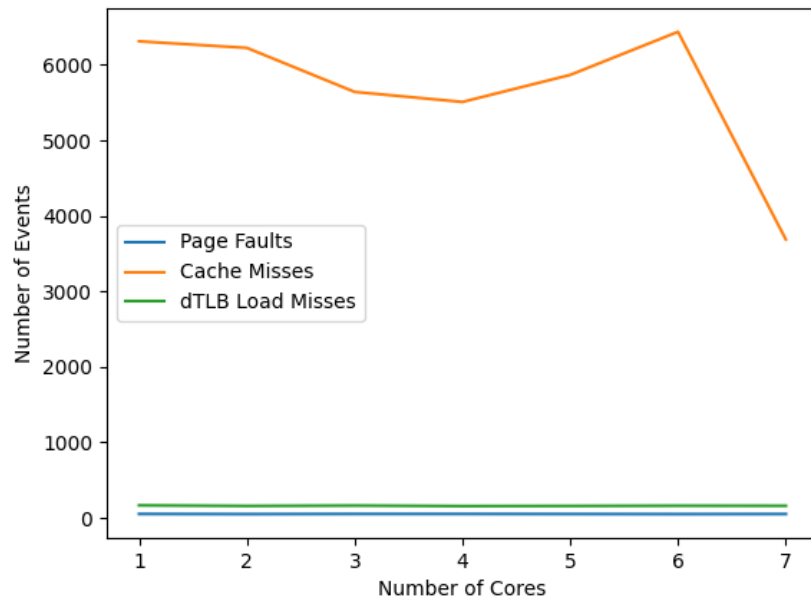
0.000675503 seconds time elapsed

0.000679000 seconds user

0.000000000 seconds sys

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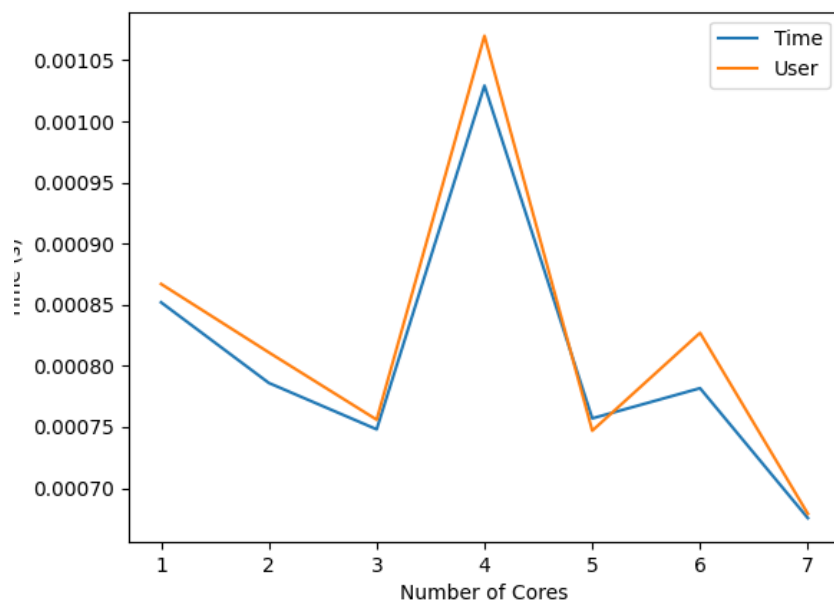
کد مربوط به این نمودار و نمودار قسمت بعد در فایل 1.3.py موجود است.
تصویر این نمودار در اینجا قابل مشاهده است.



شکل ۳: نمودار تاثیر تعداد ریسمان‌ها بر پارامترها

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نمودار خواسته شده در شکل زیر قابل مشاهده است.



شکل ۴: نمودار تاثیر تعداد ریسمان‌ها بر تاخیر زمان اجرای برنامه