```
Last login: Tue Nov 14 19:58:10 on ttys002
Sushmithas-MacBook-Air:p4 sushmithashridhar$ ls
BitMap.c        BitMap.s        Kernel.h        List.c          List.s          Main.o          Runtime.s       System.c        System.s        os              proj4.pdf
BitMap.h        DISK            Kernel.h        List.h          Main.c          Main.s          Switch.o        System.h        index.html      proj4.doc       proj4_files
BitMap.o        Kernel.c        Kernel.s        List.o          Main.h          Runtime.o       Switch.s        System.o        makefile        proj4.htm
Sushmithas-MacBook-Air:p4 sushmithashridhar$ make
kpl Main -unsafe
asm Main.s
lddd Runtime.o Switch.o System.o List.o BitMap.o Kernel.o Main.o -o os
Sushmithas-MacBook-Air:p4 sushmithashridhar$ blitz -g os
Beginning execution...
===================  KPL PROGRAM STARTING  ====================
Initializing Thread Scheduler...
Initializing Thread Manager...
Initializing Frame Manager...


*****  THREAD-MANAGER TEST  *****

123.4.56.71892.10..11...12.4.3136514151.162891718.19.7.2010..4...11...12..3.1365.151.14.2.8.18.20...10..9111612.17..3719..4.15...1482.1318.106..51.9...17.3..19.7.4.15161120...14.13.10.6.5...28917.12.1819
.715..4...1314..110.6516112.8.12...18...7.4920.1413171916..8...3...18.1510716..4591314...6....20..3.212171819115.11.8......10.6.7164.20.3592.11...8..1012613..1714718..13......1619.8415101220.917...
...5.1..132191116814.7......9.4518151631310......7...29194121120516......18.7.915.198.11462......17184..712911.15.3.....1.13.1917.184820.712...15...3516.13114199.17..7...15.18..11.3104.1656..17...13
7..8..151.1811.3..2.16.14...17201310.78.1915..5..3..616412.1411817...11.19..59...20313.61610....8..114192...5.7...20.141.69.12.811.3..418...16.57.2010.1314..19.2.....158.14691617.20...182.1957..12..81
11.15.20...10.32.4..18.13.1412.819..20..105..3.....18.113..14209..16.10113.12...15..61819.17...142.1016.12...9.11.1315620...14.25..19.9.11..1013....14216...12.17..2015.11...6...17.12.16..20...17.12..17...

*****  THREAD-MANAGER TEST COMPLETED SUCCESSFULLY  *****


*****  PROCESS-MANAGER TEST  *****

123.4.657.8129103...11..1213...14..7681514162.17359..18..101920...13...1211.146..7.15816...1.17..18219.104..313.5..129..14.7..1511..8.20171...218.19.313..5.12..916147...4.15.8...2017.2186.31951.10......9
16.415128.2017.1114.2....7...1013.916183.6.519..8....211..47.151.1012..20.93..5....1781311.14..216.4..6.1...2018.710.515..12178.11.....1624..169133.20..14.15.....1217.1118..107.5162....19..20414.18..12617
.913..310....5.1119..418.1520.7..12.2..9.3168.5.617.11...14..13.10.71219...294.18.20.6.11...114..13..3101615.17.2189....7..611.1.195413.203....17..27..810.61115.12...19..20...15714.24.8187...10....1199.20
13.5616.1711...12....10.19143.192.20..8.15....12135.18.10.1914.7..611168.3..15.....12117..13220.414..5631519......1811.12.9171613.7.1.5..10..20...41118..14612.17.19..7.8.9.10.32013..415..14..2.19..17.11
.7.181.6.124.8..1410.3..2.19...17513.1118..16..6..71514.9...20.124..17811.19.16...6.13...5.79.20.312.10..18.1615.4613....14.51..198...1018..94..1614.20..1.3..13....1991615..1.18.8.......18..1615...16.15..

*****  PROCESS-MANAGER TEST COMPLETED SUCCESSFULLY  *****


*****  FRAME-MANAGER TEST  *****

1234567.8..910..1.23..5..46.8..7.910.1.3.2.56.4..8.7...9101.3.52..6.4..8.7910..1.35..26.4..8..791.35.10..4.8.2..76.310.9.4..2.1.75..94.3.2.6.7.5..98.104.5..29..107.3..21.10..35.8.10.4.7.8.9.4.6.8.510..85.
.39..2.4.6.21.10..85..39.4..76..2.110..81..39..4.76..47..108.1..10.92..59.7..53..81..10.62..9.67.6.3.1.4.10.2.5.9.7.8.6.3.1.4.10.2.5.9.7.8.6.3.1.4.10.2.5.9.7.8.6.3.1.4.10..102.10.9.10..98..109....1109..210
..23.10..25..62.9..28...812.10.5..5.4.95...4.385...3.418.....9.234.1.8.10.5.9..2.1..8310.5.4..21.8.3.5.49..1..382.4..15.3.8.10.1.3.8.4.1.3.5.4.1.35...419..104.8..103..52..15.9.1..48..104..210..52.9..13..8
1..48.5.4.2.9.2.3.2.10.8.5.4.7.9.6.1.3.2.10.8.5.4.7..97..67..6.37..6.87..16..7.26..7.56.7..97.3.7.2.10.5.6.5.6.9..63.7.6.7.6.1.6.9.8.3.2..210..210..5.210..5.6.10.2.35..210.9.2.4.2..82.5..72..510..7.510..7
5.10.7.10.4.10..610.6.2.5..51.3..34...3104.6.2..65.1.7..37..4.3.7.43.6.5..105.2.10..2.104..2.34..38..73..7.103..72...37.48...718...7581..3.7.41..2.7.1.58..17..5.41..45..84..108..28..3.18..51.4.1.9..96..9
7..89.7..94..7.19.7..18..31.4.3.5.9.5.9.2.9.6..106..64..76..87.1.8.3.5..54..65.4.9.1.9.8.9.8..96.5..64.5..1.65.7.6.10..64..61.6.9.5..57..510..104...6104.9.6.8..58.5.3.5..104.5.9.1.8.2.2.3..210...423.4..9.
24..107.2..510.2.8.2.4..14.3.4..35.10..82..87..84...683..5.108.2..108.4..63..35..23.1.3.8..4.38..73...2710..97.4.7.8..27..82.3.8.6.10.5.9.7.9.7..92..3.89..310.9..3.79..27.8.7.10..43.4..94.9.1.9..17.
.101..31..41.9.6.9.7.9.10.9.8.9.1..51..21.3.1.4.1.9.1.7.1.7.1.7.4.4.6.4..45..4.53.4..1.54..65..68.5..69.5..106.4..76..16..9.56.9.5.4..42.1.4.10.6..106.5..75.2.8.4.9.10..106..103.1.5.1.4.9.7.6..106..102...
2810..21.10.7.10..57..4.75..27..101.10.8.4.5..65.2..76..21...321...241.7.6.2.3..39.3..910...13.9.710..2.97..69..31..34.1..23..7.92.7.9.2..19..23.10.2.10.7.6.7.1.9.5.3.4..310.3.6.1.6.9..59.8..810..8.73.8.7
..8..58.10.1.10.3.4.7..97.9.8..68..1.68..3.68.7.6..106..6.3.9..89.8.1.8..16.2.6.7.6..8.1.3.2.9.7.5.6..86.1.6.1...3.8.2.9.6.1.3.8.2.9.6.1.3.8..9.6...8..6..6.6.6.

Here is a histogram showing how many times each frame was used:
   0:  ********************************************************************************************************************************************************************************************
********************************************************************************************************************
   1:  ********************************************************************************************************************************************************************************************
*****************************************************************************************************
   2:  ********************************************************************************************************************************************************************************************
************************************************************************************************
   3:  ********************************************************************************************************************************************************************************************
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   4:  ********************************************************************************************************************************************************************************************
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   5:  ********************************************************************************************************************************************************************************************
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   6:  ********************************************************************************************************************************************************************************************
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   7:  ********************************************************************************************************************************************************************************************
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   8:  ********************************************************************************************************************************************************************************************
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   9:  ********************************************************************************************************************************************************************************************
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  10:  ********************************************************************************************************************************************************************************************
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  11:  ********************************************************************************************************************************************************************************************
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  12:  ********************************************************************************************************************************************************************************************
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  13:  ********************************************************************************************************************************************************************************************
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  14:  ********************************************************************************************************************************************************************************************
  15:  ********************************************************************************************************************************************************************************************
  16:  ********************************************************************************************************************************************************************************************
  17:  ********************************************************************************************************************************************************************************************
  18:  ********************************************************************************************************************************************************************************************
  19:  ********************************************************************************************************************************************************************************************
  20:  ********************************************************************************************************************************************************************************************
  21:  ********************************************************************************************************************************************************************************************
  22:  ********************************************************************************************************************************************************************************************
  23:  ********************************************************************************************************************************************************************************************
  24:  ********************************************************************************************************************************************************************************************
  25:  ********************************************************************************************************************************************************************************
  26:  ***********************************************************************************


*****  FRAME-MANAGER TEST COMPLETED SUCCESSFULLY  *****


~~~~~~~~~~~~~~~~    HOARE TEST   ~~~~~~~~~~~~~~~~~


                    ****INCREMENTING****

Thread before Increment : Increment-1
Increment-1...................................WAIT MAXCOUNT REACHED


                    ****INCREMENTING****
```

```
Thread before Increment : Increment-2
Increment-2....................................WAIT MAXCOUNT REACHED


                    ****INCREMENTING****

Thread before Increment : Increment-3
Increment-3....................................WAIT MAXCOUNT REACHED


                    ****DECREMENTING****
Thread after Signal : Decrement-4 = 1

Value After Decrement:  9
Thread before Signal : Decrement-4

....................Handing over the mutex lock....................



                    ****INCREMENTING****

Increment-1......................WOKE UP

Thread before Increment : Increment-1

Value After Increment:  10
Thread before Signal : Increment-1

....................Handing over the mutex lock....................



                    ****DECREMENTING****
Thread after Signal : Decrement-5 = 1

Value After Decrement:  9
Thread before Signal : Decrement-5

....................Handing over the mutex lock....................



                    ****INCREMENTING****

Increment-2......................WOKE UP

Thread before Increment : Increment-2

Value After Increment:  10
Thread before Signal : Increment-2

....................Handing over the mutex lock....................



                    ****DECREMENTING****
Thread after Signal : Decrement-6 = 0

Value After Decrement:  10
Thread before Signal : Decrement-6

....................Handing over the mutex lock....................



                    ****INCREMENTING****

Increment-3......................WOKE UP

Thread before Increment : Increment-3

Value After Increment:  11
Thread before Signal : Increment-3

....................Handing over the mutex lock....................



                    ****DECREMENTING****
Thread after Signal : Decrement-7 = 1

Value After Decrement:  10
Thread before Signal : Decrement-7

....................Handing over the mutex lock....................


*****  A 'wait' instruction was executed and no more interrupts are scheduled... halting emulation!  *****

Done!  The next instruction to execute will be:
001138: 09000000        ret
Number of Disk Reads    = 0
Number of Disk Writes   = 0
Instructions Executed   = 81967624
Time Spent Sleeping     = 0
    Total Elapsed Time  = 81967624
Sushmithas-MacBook-Air:p4 sushmithashridhar$
```