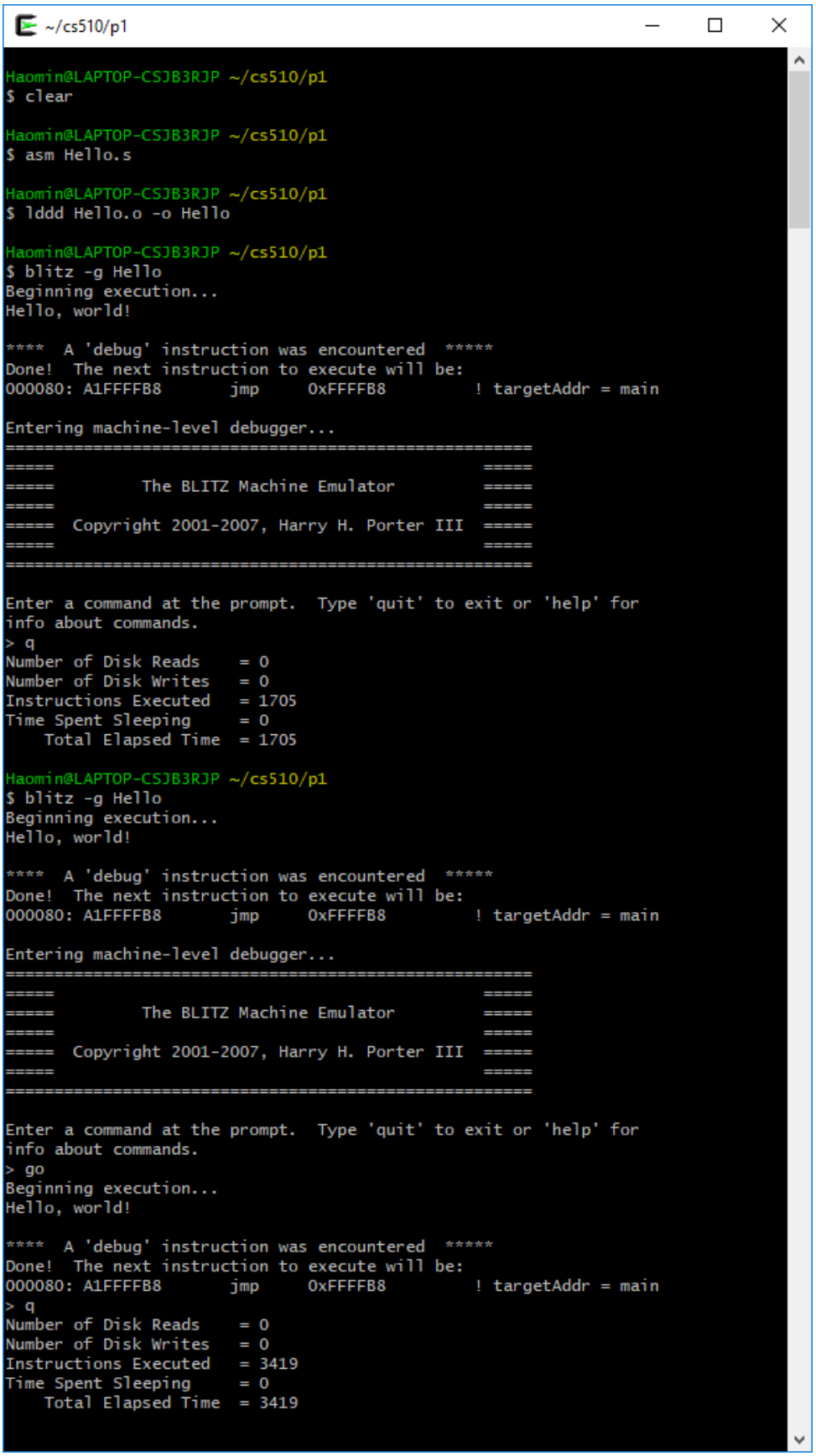
~/cs510/p1
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ clear
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ asm Hello.s
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ lddd Hello.o -o Hello
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz -g Hello
Beginning execution...
Hello, world!
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
000080: A1FFFFB8 jmp 0xFFFFB8 ! targetAddr = main
Entering machine-level debugger...
The BLITZ Machine Emulator
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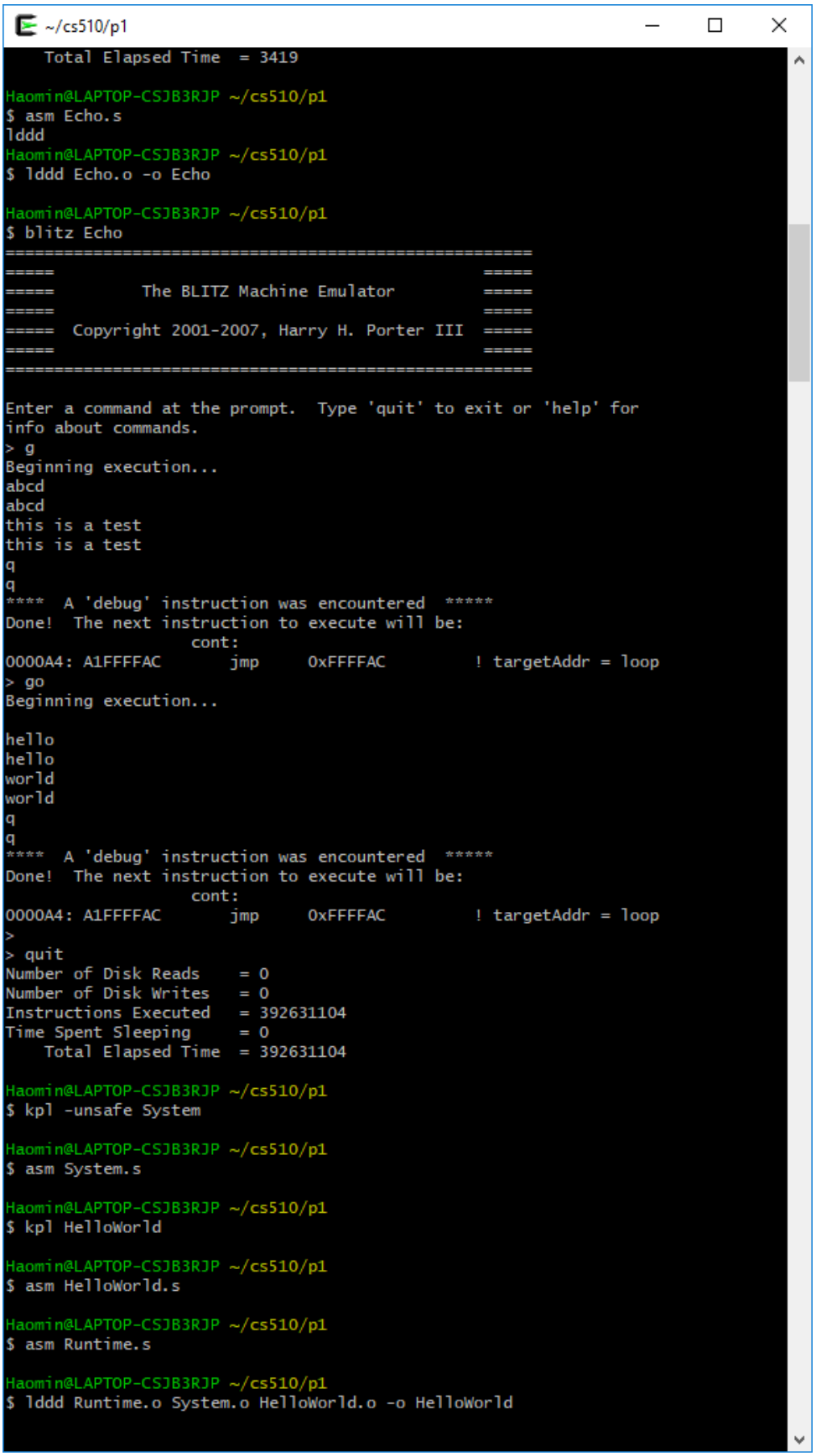
Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> q
Number of Disk Reads = 0
Number of Disk Writes = 0
Instructions Executed = 1705
Time Spent Sleeping = 0
Total Elapsed Time = 1705
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz -g Hello
Beginning execution...
Hello, world!
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
000080: A1FFFFB8 jmp 0xFFFFB8 ! targetAddr = main
Entering machine-level debugger...
The BLITZ Machine Emulator
Copyright 2001-2007, Harry H. Porter III
Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> go
Beginning execution...
Hello, world!
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
000080: A1FFFFB8 jmp 0xFFFFB8 ! targetAddr = main
> q
Number of Disk Reads = 0
Number of Disk Writes = 0
Instructions Executed = 3419
Time Spent Sleeping = 0
Total Elapsed Time = 3419


~/cs510/p1
Total Elapsed Time = 3419
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ asm Echo.s
lddd
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ lddd Echo.o -o Echo
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz Echo
The BLITZ Machine Emulator
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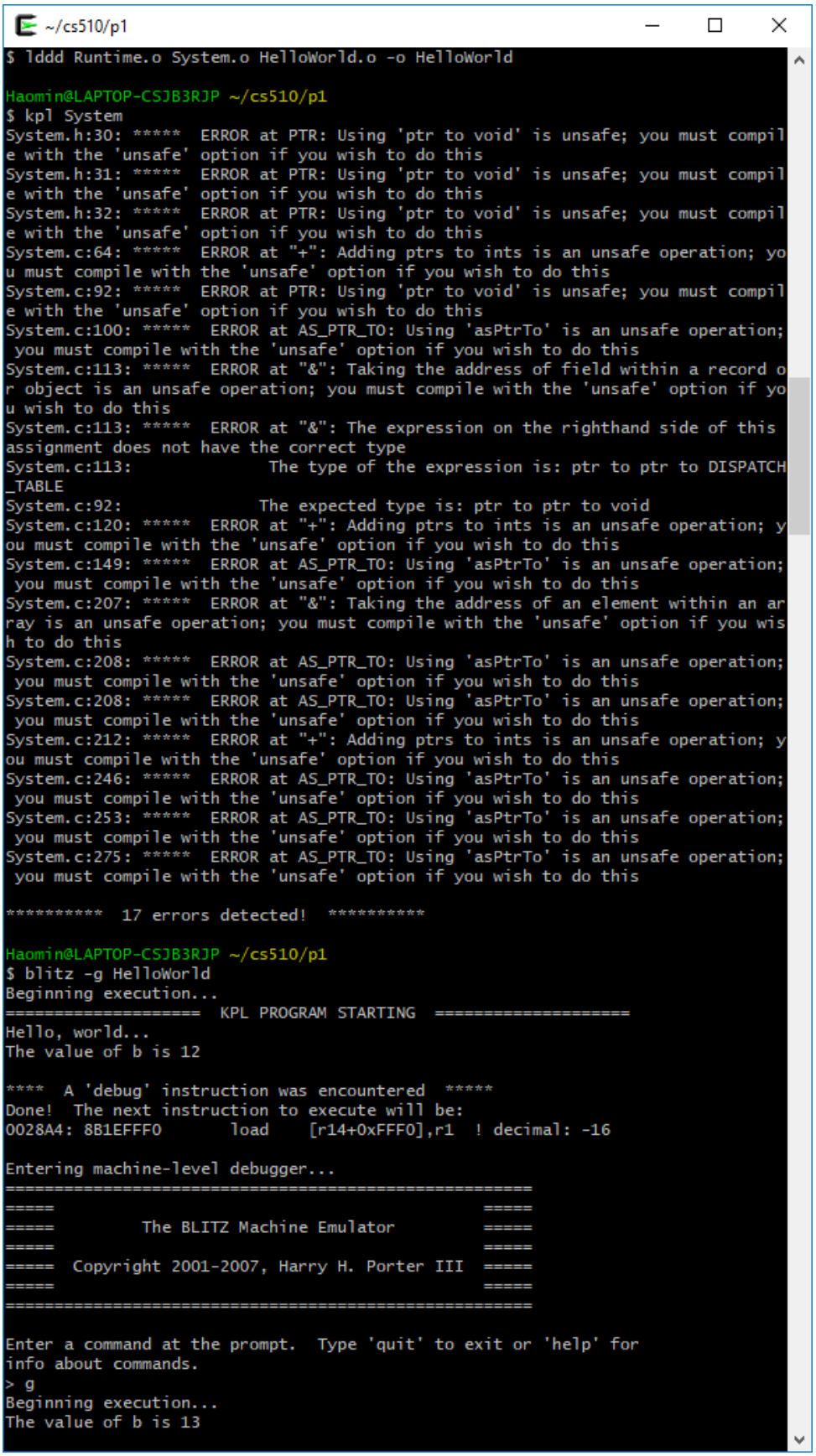
Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> g
Beginning execution...
abcd
abcd
this is a test
this is a test
q
q
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
cont:
0000A4: A1FFFFAC jmp 0xFFFFAC ! targetAddr = loop
> go
Beginning execution...
hello
hello
world
world
q
q
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
cont:
0000A4: A1FFFFAC jmp 0xFFFFAC ! targetAddr = loop
>
> quit
Number of Disk Reads = 0
Number of Disk Writes = 0
Instructions Executed = 392631104
Time Spent Sleeping = 0
Total Elapsed Time = 392631104
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ kpl -unsafe System
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ asm System.s
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ kpl HelloWorld
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ asm HelloWorld.s
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ asm Runtime.s
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ lddd Runtime.o System.o HelloWorld.o -o HelloWorld


~/cs510/p1
$ lddd Runtime.o System.o HelloWorld.o -o HelloWorld
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ kpl System
System.h:30: ***** ERROR at PTR: Using 'ptr to void' is unsafe; you must compil
e with the 'unsafe' option if you wish to do this
System.h:31: ***** ERROR at PTR: Using 'ptr to void' is unsafe; you must compil
e with the 'unsafe' option if you wish to do this
System.h:32: ***** ERROR at PTR: Using 'ptr to void' is unsafe; you must compil
e with the 'unsafe' option if you wish to do this
System.c:64: ***** ERROR at "+": Adding ptrs to ints is an unsafe operation; yo
u must compile with the 'unsafe' option if you wish to do this
System.c:92: ***** ERROR at PTR: Using 'ptr to void' is unsafe; you must compil
e with the 'unsafe' option if you wish to do this
System.c:100: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:113: ***** ERROR at "&": Taking the address of field within a record o
r object is an unsafe operation; you must compile with the 'unsafe' option if yo
u wish to do this
System.c:113: ***** ERROR at "&": The expression on the righthand side of this
assignment does not have the correct type
System.c:113: The type of the expression is: ptr to ptr to DISPATCH
_TABLE
System.c:92: The expected type is: ptr to ptr to void
System.c:120: ***** ERROR at "+": Adding ptrs to ints is an unsafe operation; y
ou must compile with the 'unsafe' option if you wish to do this
System.c:149: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:207: ***** ERROR at "&": Taking the address of an element within an ar
ray is an unsafe operation; you must compile with the 'unsafe' option if you wis
h to do this
System.c:208: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:208: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:212: ***** ERROR at "+": Adding ptrs to ints is an unsafe operation; y
ou must compile with the 'unsafe' option if you wish to do this
System.c:246: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:253: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
System.c:275: ***** ERROR at AS_PTR_TO: Using 'asPtrTo' is an unsafe operation;
you must compile with the 'unsafe' option if you wish to do this
********** 17 errors detected! **********
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz -g HelloWorld
Beginning execution...
==================== KPL PROGRAM STARTING ====================
Hello, world...
The value of b is 12
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
Entering machine-level debugger...
=====
=====
=====
=====
=====
=====
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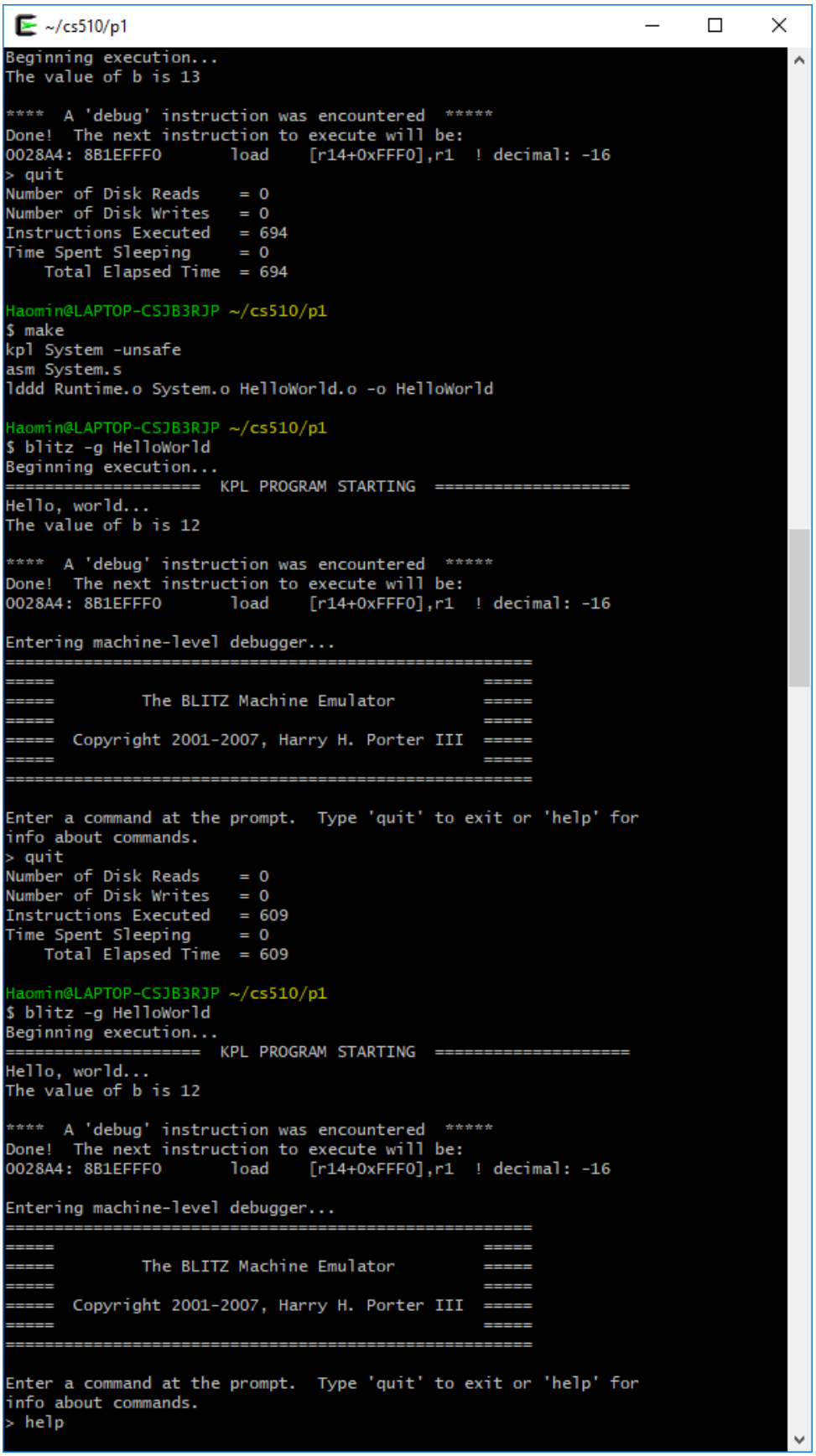
Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> g
Beginning execution...
The value of b is 13


~/cs510/p1
Beginning execution...
The value of b is 13
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
> quit
Number of Disk Reads = 0
Number of Disk Writes = 0
Instructions Executed = 694
Time Spent Sleeping = 0
Total Elapsed Time = 694
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ make
kpl System -unsafe
asm System.s
lddd Runtime.o System.o HelloWorld.o -o HelloWorld
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz -g HelloWorld
Beginning execution...
================== KPL PROGRAM STARTING ==================
Hello, world...
The value of b is 12
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
Entering machine-level debugger...
=====
The BLITZ Machine Emulator
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Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> quit
Number of Disk Reads = 0
Number of Disk Writes = 0
Instructions Executed = 609
Time Spent Sleeping = 0
Total Elapsed Time = 609
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$ blitz -g HelloWorld
Beginning execution...
================== KPL PROGRAM STARTING ==================
Hello, world...
The value of b is 12
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
Entering machine-level debugger...
=====
The BLITZ Machine Emulator
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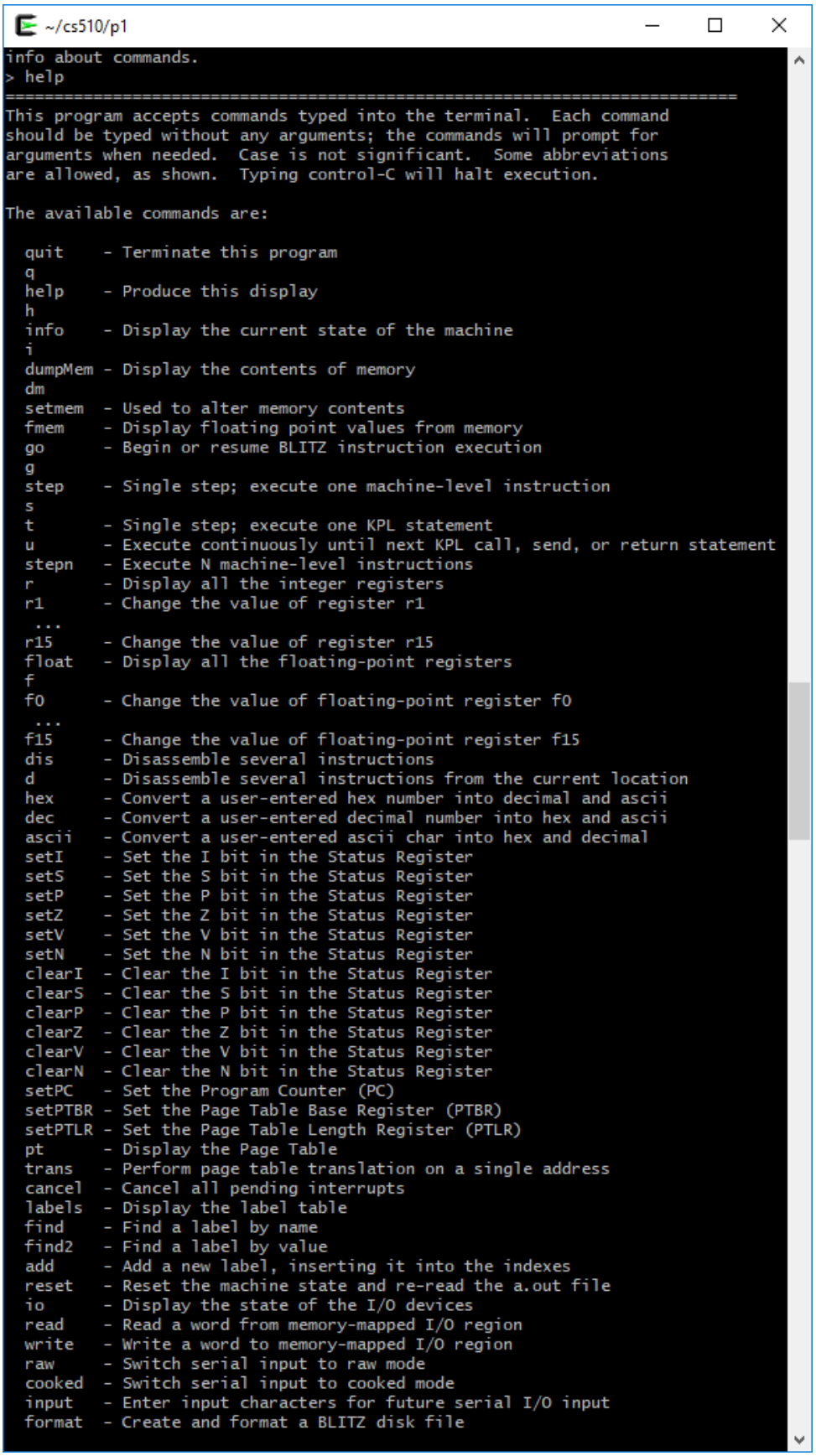
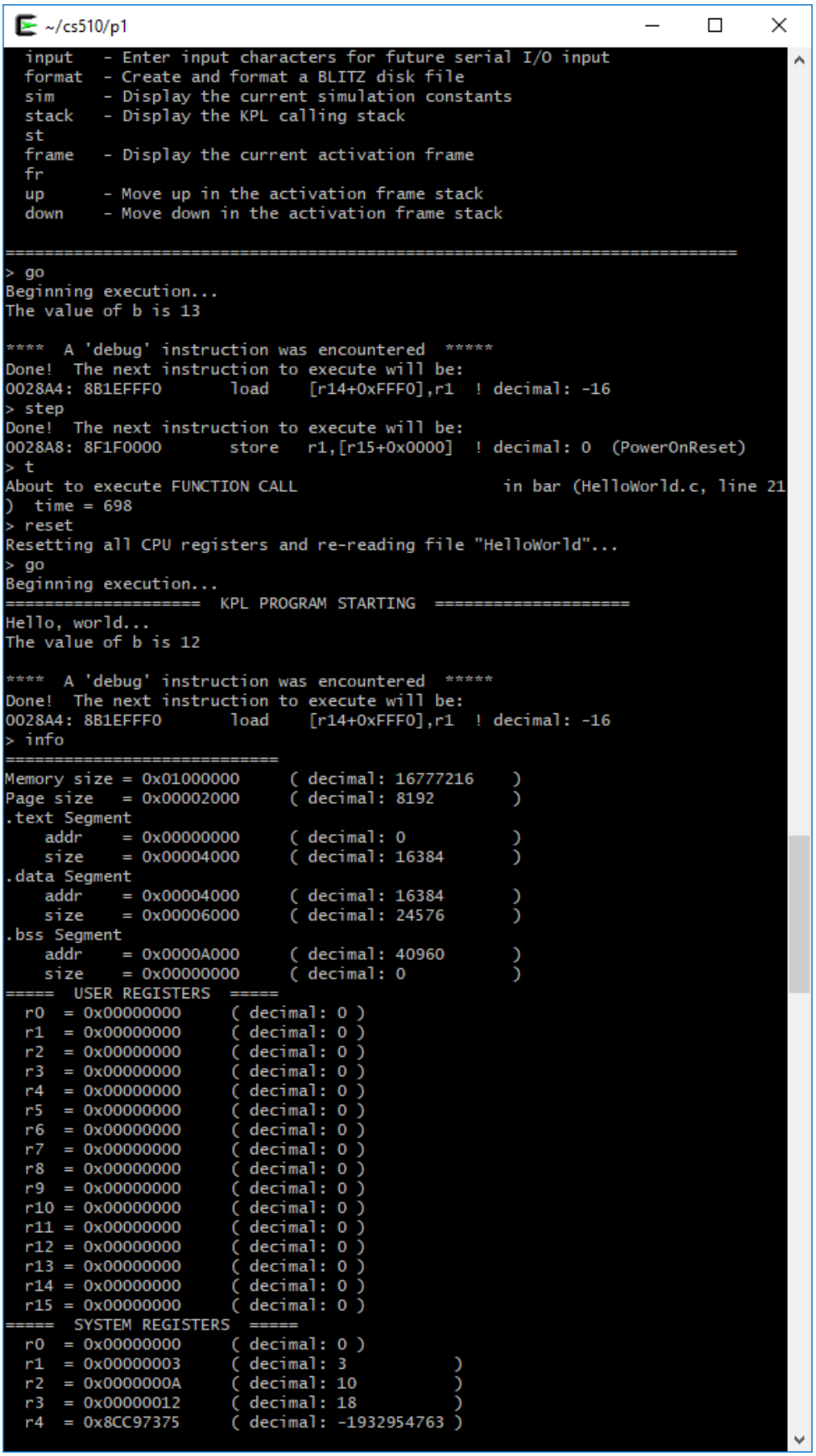
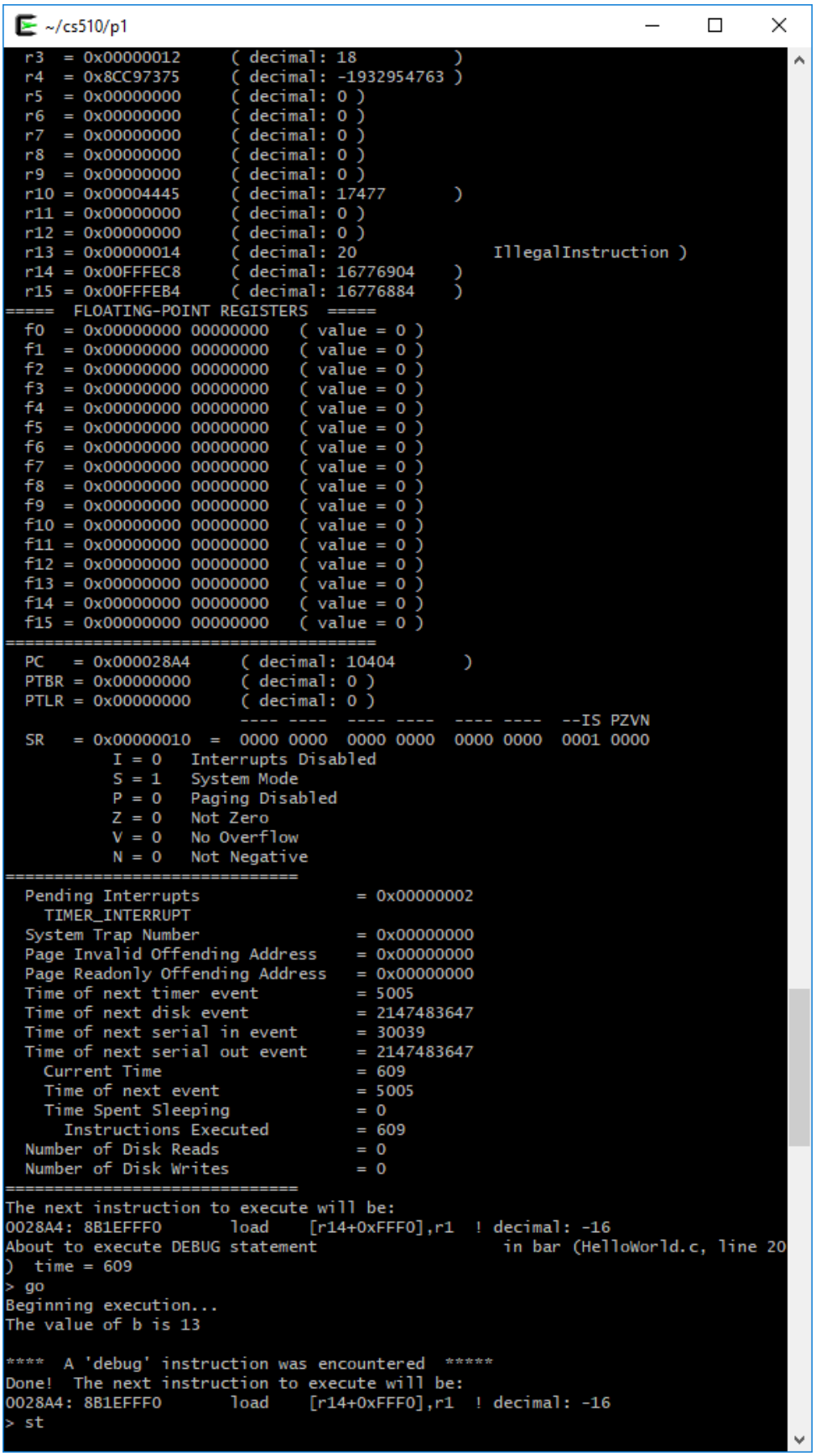
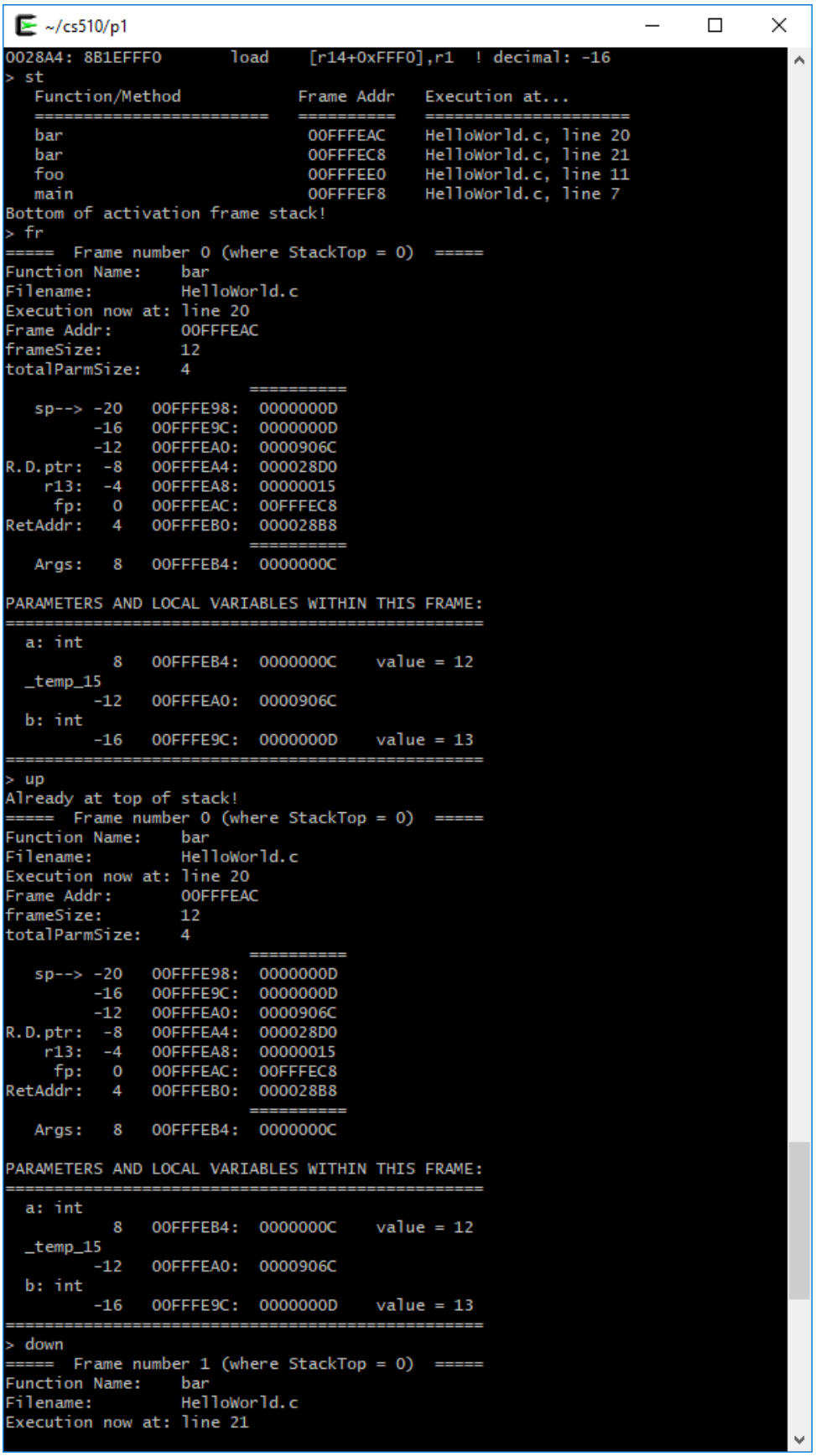
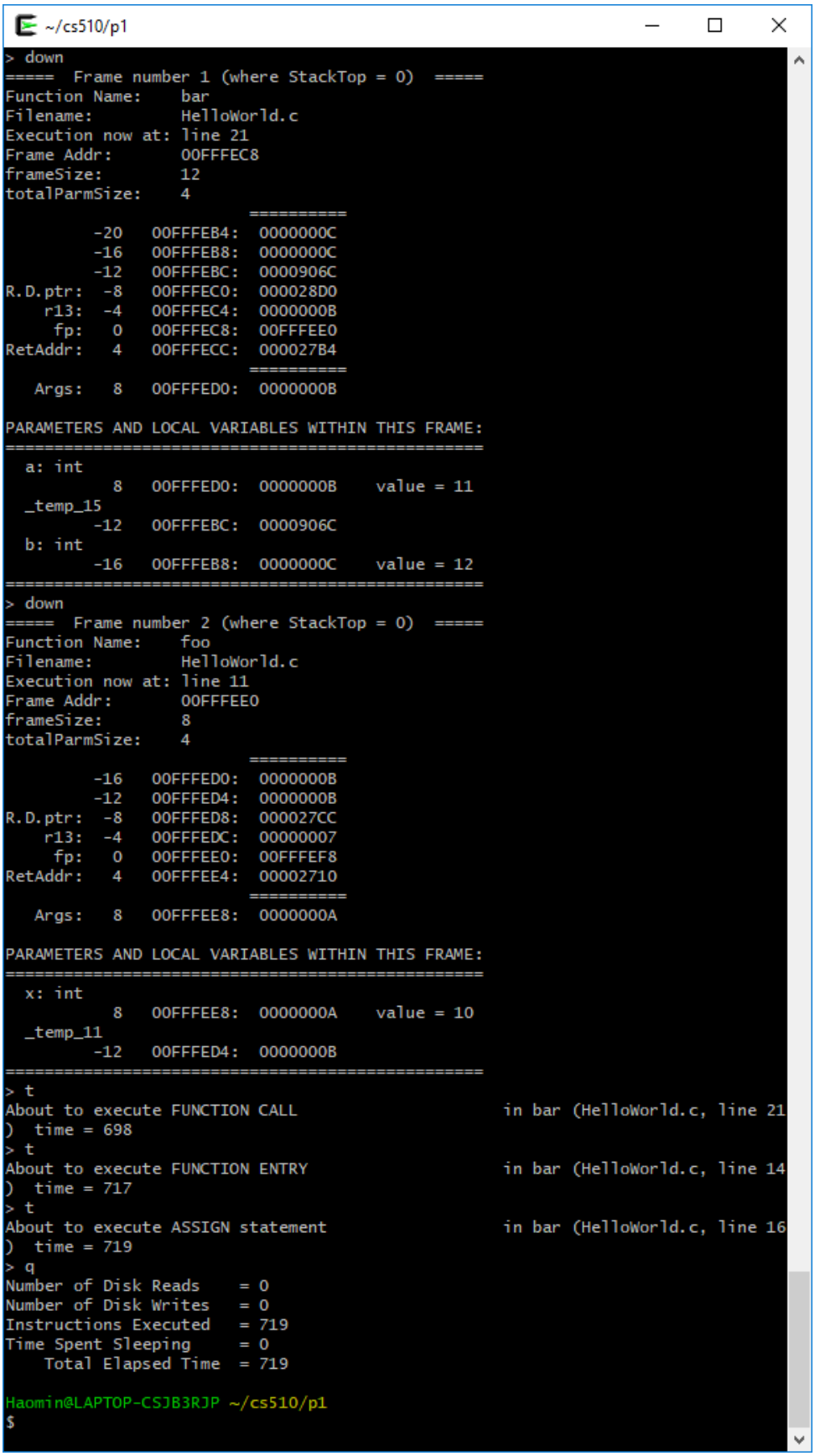
Enter a command at the prompt. Type 'quit' to exit or 'help' for
info about commands.
> help


~/cs510/p1
info about commands.
> help
This program accepts commands typed into the terminal. Each command
should be typed without any arguments; the commands will prompt for
arguments when needed. Case is not significant. Some abbreviations
are allowed, as shown. Typing control-C will halt execution.
The available commands are:
quit - Terminate this program
q
help - Produce this display
h
info - Display the current state of the machine
i
dumpMem - Display the contents of memory
dm
setmem - Used to alter memory contents
fmem - Display floating point values from memory
go - Begin or resume BLITZ instruction execution
g
step - Single step; execute one machine-level instruction
s
t - Single step; execute one KPL statement
u - Execute continuously until next KPL call, send, or return statement
stepn - Execute N machine-level instructions
r - Display all the integer registers
r1 - Change the value of register r1
...
r15 - Change the value of register r15
float - Display all the floating-point registers
f
f0 - Change the value of floating-point register f0
...
f15 - Change the value of floating-point register f15
dis - Disassemble several instructions
d - Disassemble several instructions from the current location
hex - Convert a user-entered hex number into decimal and ascii
dec - Convert a user-entered decimal number into hex and ascii
ascii - Convert a user-entered ascii char into hex and decimal
setI - Set the I bit in the Status Register
setS - Set the S bit in the Status Register
setP - Set the P bit in the Status Register
setZ - Set the Z bit in the Status Register
setV - Set the V bit in the Status Register
setN - Set the N bit in the Status Register
clearI - Clear the I bit in the Status Register
clearS - Clear the S bit in the Status Register
clearP - Clear the P bit in the Status Register
clearZ - Clear the Z bit in the Status Register
clearV - Clear the V bit in the Status Register
clearN - Clear the N bit in the Status Register
setPC - Set the Program Counter (PC)
setPTBR - Set the Page Table Base Register (PTBR)
setPTLR - Set the Page Table Length Register (PTLR)
pt - Display the Page Table
trans - Perform page table translation on a single address
cancel - Cancel all pending interrupts
labels - Display the label table
find - Find a label by name
find2 - Find a label by value
add - Add a new label, inserting it into the indexes
reset - Reset the machine state and re-read the a.out file
io - Display the state of the I/O devices
read - Read a word from memory-mapped I/O region
write - Write a word to memory-mapped I/O region
raw - Switch serial input to raw mode
cooked - Switch serial input to cooked mode
input - Enter input characters for future serial I/O input
format - Create and format a BLITZ disk file


~/cs510/p1
input - Enter input characters for future serial I/O input
format - Create and format a BLITZ disk file
sim - Display the current simulation constants
stack - Display the KPL calling stack
st
frame - Display the current activation frame
fr
up - Move up in the activation frame stack
down - Move down in the activation frame stack
> go
Beginning execution...
The value of b is 13
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
> step
Done! The next instruction to execute will be:
0028A8: 8F1F0000 store r1,[r15+0x0000] ! decimal: 0 (PowerOnReset)
> t
About to execute FUNCTION CALL in bar (HelloWorld.c, line 21
) time = 698
> reset
Resetting all CPU registers and re-reading file "HelloWorld"...
> go
Beginning execution...
KPL PROGRAM STARTING
Hello, world...
The value of b is 12
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
> info
Memory size = 0x01000000 (decimal: 16777216)
Page size = 0x00002000 (decimal: 8192)
.text Segment
addr = 0x00000000 (decimal: 0)
size = 0x00004000 (decimal: 16384)
.data Segment
addr = 0x00004000 (decimal: 16384)
size = 0x00006000 (decimal: 24576)
.bss Segment
addr = 0x0000A000 (decimal: 40960)
size = 0x00000000 (decimal: 0)
USER REGISTERS
r0 = 0x00000000 (decimal: 0)
r1 = 0x00000000 (decimal: 0)
r2 = 0x00000000 (decimal: 0)
r3 = 0x00000000 (decimal: 0)
r4 = 0x00000000 (decimal: 0)
r5 = 0x00000000 (decimal: 0)
r6 = 0x00000000 (decimal: 0)
r7 = 0x00000000 (decimal: 0)
r8 = 0x00000000 (decimal: 0)
r9 = 0x00000000 (decimal: 0)
r10 = 0x00000000 (decimal: 0)
r11 = 0x00000000 (decimal: 0)
r12 = 0x00000000 (decimal: 0)
r13 = 0x00000000 (decimal: 0)
r14 = 0x00000000 (decimal: 0)
r15 = 0x00000000 (decimal: 0)
SYSTEM REGISTERS
r0 = 0x00000000 (decimal: 0)
r1 = 0x00000003 (decimal: 3)
r2 = 0x0000000A (decimal: 10)
r3 = 0x00000012 (decimal: 18)
r4 = 0x8CC97375 (decimal: -1932954763)


~/cs510/p1
r3 = 0x00000012 (decimal: 18)
r4 = 0x8CC97375 (decimal: -1932954763)
r5 = 0x00000000 (decimal: 0)
r6 = 0x00000000 (decimal: 0)
r7 = 0x00000000 (decimal: 0)
r8 = 0x00000000 (decimal: 0)
r9 = 0x00000000 (decimal: 0)
r10 = 0x00004445 (decimal: 17477)
r11 = 0x00000000 (decimal: 0)
r12 = 0x00000000 (decimal: 0)
r13 = 0x00000014 (decimal: 20 IllegalInstruction)
r14 = 0x00FFFEC8 (decimal: 16776904)
r15 = 0x00FFFEB4 (decimal: 16776884)
===== FLOATING-POINT REGISTERS =====
f0 = 0x00000000 00000000 (value = 0)
f1 = 0x00000000 00000000 (value = 0)
f2 = 0x00000000 00000000 (value = 0)
f3 = 0x00000000 00000000 (value = 0)
f4 = 0x00000000 00000000 (value = 0)
f5 = 0x00000000 00000000 (value = 0)
f6 = 0x00000000 00000000 (value = 0)
f7 = 0x00000000 00000000 (value = 0)
f8 = 0x00000000 00000000 (value = 0)
f9 = 0x00000000 00000000 (value = 0)
f10 = 0x00000000 00000000 (value = 0)
f11 = 0x00000000 00000000 (value = 0)
f12 = 0x00000000 00000000 (value = 0)
f13 = 0x00000000 00000000 (value = 0)
f14 = 0x00000000 00000000 (value = 0)
f15 = 0x00000000 00000000 (value = 0)
PC = 0x000028A4 (decimal: 10404)
PTBR = 0x00000000 (decimal: 0)
PTLR = 0x00000000 (decimal: 0)
---- ---- ---- ---- ---- ---- --IS PZVN
SR = 0x00000010 = 0000 0000 0000 0000 0000 0000 0001 0000
I = 0 Interrupts Disabled
S = 1 System Mode
P = 0 Paging Disabled
Z = 0 Not Zero
V = 0 No Overflow
N = 0 Not Negative
Pending Interrupts = 0x00000002
TIMER_INTERRUPT
System Trap Number = 0x00000000
Page Invalid Offending Address = 0x00000000
Page Readonly Offending Address = 0x00000000
Time of next timer event = 5005
Time of next disk event = 2147483647
Time of next serial in event = 30039
Time of next serial out event = 2147483647
Current Time = 609
Time of next event = 5005
Time Spent Sleeping = 0
Instructions Executed = 609
Number of Disk Reads = 0
Number of Disk Writes = 0
The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
About to execute DEBUG statement in bar (HelloWorld.c, line 20
) time = 609
> go
Beginning execution...
The value of b is 13
**** A 'debug' instruction was encountered *****
Done! The next instruction to execute will be:
0028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
> st


~/cs510/p1
00028A4: 8B1EFFF0 load [r14+0xFFF0],r1 ! decimal: -16
> st
Function/Method Frame Addr Execution at...
bar 00FFFEAC HelloWorld.c, line 20
bar 00FFFEC8 HelloWorld.c, line 21
foo 00FFFEE0 HelloWorld.c, line 11
main 00FFFEF8 HelloWorld.c, line 7
Bottom of activation frame stack!
> fr
===== Frame number 0 (where StackTop = 0) =====
Function Name: bar
Filename: HelloWorld.c
Execution now at: line 20
Frame Addr: 00FFFEAC
frameSize: 12
totalParmSize: 4
sp--> -20 00FFFE98: 0000000D
-16 00FFFE9C: 0000000D
-12 00FFFEA0: 0000906C
R.D.ptr: -8 00FFFEA4: 000028D0
r13: -4 00FFFEA8: 00000015
fp: 0 00FFFEAC: 00FFFEC8
RetAddr: 4 00FFFEB0: 000028B8
Args: 8 00FFFEB4: 0000000C
PARAMETERS AND LOCAL VARIABLES WITHIN THIS FRAME:
a: int
8 00FFFEB4: 0000000C value = 12
_temp_15
-12 00FFFEA0: 0000906C
b: int
-16 00FFFE9C: 0000000D value = 13
> up
Already at top of stack!
===== Frame number 0 (where StackTop = 0) =====
Function Name: bar
Filename: HelloWorld.c
Execution now at: line 20
Frame Addr: 00FFFEAC
frameSize: 12
totalParmSize: 4
sp--> -20 00FFFE98: 0000000D
-16 00FFFE9C: 0000000D
-12 00FFFEA0: 0000906C
R.D.ptr: -8 00FFFEA4: 000028D0
r13: -4 00FFFEA8: 00000015
fp: 0 00FFFEAC: 00FFFEC8
RetAddr: 4 00FFFEB0: 000028B8
Args: 8 00FFFEB4: 0000000C
PARAMETERS AND LOCAL VARIABLES WITHIN THIS FRAME:
a: int
8 00FFFEB4: 0000000C value = 12
_temp_15
-12 00FFFEA0: 0000906C
b: int
-16 00FFFE9C: 0000000D value = 13
> down
===== Frame number 1 (where StackTop = 0) =====
Function Name: bar
Filename: HelloWorld.c
Execution now at: line 21


~/cs510/p1
> down
===== Frame number 1 (where StackTop = 0) =====
Function Name: bar
Filename: HelloWorld.c
Execution now at: line 21
Frame Addr: 00FFFEC8
frameSize: 12
totalParmSize: 4
                          ==========
         -20   00FFFEB4: 0000000C
         -16   00FFFEB8: 0000000C
         -12   00FFFEBC: 0000906C
R.D.ptr: -8   00FFFEC0: 000028D0
    r13: -4   00FFFEC4: 0000000B
     fp: 0   00FFFEC8: 00FFFEE0
RetAddr: 4   00FFFECC: 000027B4
                          ==========
   Args: 8   00FFFED0: 0000000B
PARAMETERS AND LOCAL VARIABLES WITHIN THIS FRAME:
  a: int
           8   00FFFED0: 0000000B   value = 11
  _temp_15
         -12   00FFFEBC: 0000906C
  b: int
         -16   00FFFEB8: 0000000C   value = 12
> down
===== Frame number 2 (where StackTop = 0) =====
Function Name: foo
Filename: HelloWorld.c
Execution now at: line 11
Frame Addr: 00FFFEE0
frameSize: 8
totalParmSize: 4
                          ==========
         -16   00FFFED0: 0000000B
         -12   00FFFED4: 0000000B
R.D.ptr: -8   00FFFED8: 000027CC
    r13: -4   00FFFEDC: 00000007
     fp: 0   00FFFEE0: 00FFFEF8
RetAddr: 4   00FFFEE4: 00002710
                          ==========
   Args: 8   00FFFEE8: 0000000A
PARAMETERS AND LOCAL VARIABLES WITHIN THIS FRAME:
  x: int
           8   00FFFEE8: 0000000A   value = 10
  _temp_11
         -12   00FFFED4: 0000000B
> t
About to execute FUNCTION CALL   in bar (HelloWorld.c, line 21
) time = 698
> t
About to execute FUNCTION ENTRY   in bar (HelloWorld.c, line 14
) time = 717
> t
About to execute ASSIGN statement   in bar (HelloWorld.c, line 16
) time = 719
> q
Number of Disk Reads   = 0
Number of Disk Writes   = 0
Instructions Executed   = 719
Time Spent Sleeping   = 0
    Total Elapsed Time   = 719
Haomin@LAPTOP-CSJB3RJP ~/cs510/p1
$