

```
Activities Terminal Sun 10:41 vsduser@vsduser-VirtualBox: ~
File Edit View Search Terminal Tabs Help
vsduser@vsduser-VirtualBox: ~
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -Ofast -mabi=lp64 -march=rv64i -o sumiton.o sumiton.c
vsduser@vsduser-VirtualBox:~$ gcc sumiton.c
vsduser@vsduser-VirtualBox:~$ ./a.out
Sum of numbers from 1 to 100 is 5050
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -Ofast -mabi=lp64 -march=rv64i -o sumiton.o sumiton.c
vsduser@vsduser-VirtualBox:~$ spike pk sumiton.o
bbl loader
Sum of numbers from 1 to 100 is 5050
vsduser@vsduser-VirtualBox:~$ spike -d pk sumiton.o
(spike) until pc 0 100b0
bbl loader
(spike) reg 0 a2
0x0000000000000000
(spike)
core 0: 0x000000000000100b0 (0x00001637) lui a2, 0x1
(spike)
core 0: 0x000000000000100b4 (0x00021537) lui a0, 0x21
(spike) reg 0 a0
0x00000000000021000
(spike)
core 0: 0x000000000000100b8 (0xff010113) addi sp, sp, -16
(spike) reg 0 sp
0x00000003ffffffb40
(spike) q
vsduser@vsduser-VirtualBox:~$ spike -d pk sumiton.o
(spike) until pc 0 100b8
bbl loader
(spike) reg i sp
Bad or missing arguments for command reg
(spike) reg 0 sp
0x00000003ffffffb50
(spike)
core 0: 0x000000000000100b8 (0xff010113) addi sp, sp, -16
(spike) reg 0 sp
0x00000003ffffffb40
(spike)
core 0: 0x000000000000100bc (0x3ba60613) addi a2, a2, 954
(spike)
>
```

```
Activities Terminal Sun 10:42 vsduser@vsduser-VirtualBox: ~
File Edit View Search Terminal Tabs Help
vsduser@vsduser-VirtualBox: ~
vsduser@vsduser-VirtualBox: ~
vsduser@vsduser-VirtualBox: ~
vsduser@vsduser-VirtualBox: ~

0000000000100b0 <main>:
100b0: 00001637 lui a2,0x1
100b4: 00021537 lui a0,0x21
100b8: ff010113 addi sp,sp,-16
100bc: 3ba00613 addi a2,a2,954 # 13ba <main+0xecf6>
100c0: 06400593 li a1,100
100c4: 18050513 addi a0,a0,384 # 21180 <__clzdi2+0x44>
100c8: 00113423 sd ra,8(sp)
100cc: 340000ef jal ra,1040c <printf>
100d0: 00813083 ld ra,8(sp)
100d4: 00000513 li a0,0
100d8: 01010113 addi sp,sp,16
100dc: 00008067 ret

0000000000100e0 <register_fini>:
100e0: ffff0707 auipc a5,0xffff0
100e4: f2078793 addi a5,a5,-224 # 0 <main+0x100b0>
100e8: 00078863 beqz a5,100f8 <register_fini+0x18>
100ec: 00000517 auipc a0,0x0
100f0: 11050513 addi a0,a0,272 # 101fc <__libc_fini_array>
100f4: 0c00006f j 101b4 <atexit>
100f8: 00008067 ret

0000000000100fc <_start>:
100fc: 00013197 auipc gp,0x13
10100: 90c18193 addi gp,gp,-1780 # 22a08 <__global_pointer$>
10104: 77018513 addi a0,gp,1904 # 23178 <_edata>
10108: 00013617 auipc a2,0x13
1010c: 10060613 addi a2,a2,256 # 23208 <__BSS_END__>
10110: 40a60633 sub a2,a2,a0
10114: 00000593 li a1,0
10118: 1d4000ef jal ra,102ec <memset>
1011c: 00000517 auipc a0,0x0
10120: 0e050513 addi a0,a0,224 # 101fc <__libc_fini_array>
10124: 090000ef jal ra,101b4 <atexit>
10128: 130000ef jal ra,10258 <__libc_init_array>
1012c: 00012503 lw a0,0(sp)
10130: 00810593 addi a1,sp,8
10134: 00000613 li a2,0
10138: f79ff0ef jal ra,100b0 <main>
1013c: 08c0006f j 101c8 <exit>

000000000010140 <__do_global_ctors_aux>:
:[]
```

```
Activities Terminal Sun 10:42 vsduser@vsduser-VirtualBox: ~
File Edit View Search Terminal Tabs Help
vsduser@vsduser-VirtualBox: ~
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -O1 -mabi=lp64 -march=rv64i -o sumiton.o sumiton.c
vsduser@vsduser-VirtualBox:~$ gcc sumiton.c
vsduser@vsduser-VirtualBox:~$ ./a.out
Sum of numbers from 1 to 100 is 5050
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -O1 -mabi=lp64 -march=rv64i -o sumiton.o sumiton.c
vsduser@vsduser-VirtualBox:~$ spike pk sumiton.o
bbl loader
Sum of numbers from 1 to 100 is 5050
vsduser@vsduser-VirtualBox:~$ spike -d pk sumiton.o
(spike) until pc 0 10184
bbl loader
(spike) reg 0 sp
0x0000003fffffb50
(spike)
core 0: 0x0000000000010184 (0xff010113) addi sp, sp, -16
(spike)
core 0: 0x0000000000010188 (0x0113423) sd ra, 8(sp)
(spike) reg 0 ra
0x000000000001010c
(spike)
core 0: 0x000000000001018c (0x06400793) li a5, 100
(spike)
core 0: 0x0000000000010190 (0xffff7879b) addiw a5, a5, -1
(spike) reg 0 a5
0x0000000000000063
(spike)
core 0: 0x0000000000010194 (0xfe079ee3) bnez a5, pc - 4
(spike)
core 0: 0x0000000000010190 (0xffff7879b) addiw a5, a5, -1
(spike)
```

```
Activities Terminal Sun 10:42 vsduser@vsduser-VirtualBox: ~
File Edit View Search Terminal Tabs Help
vsduser@vsduser-VirtualBox: ~ x vsduser@vsduser-VirtualBox: ~ x vsduser@vsduser-VirtualBox: ~ x vsduser@vsduser-VirtualBox: ~ x
10180: 00008067 ret
000000000010184 <main>:
10184: ff010113 addi sp,sp,-16
10188: 00113423 sd ra,8(sp)
1018c: 00400793 li a5,100
10190: fff7879b addiw a5,a5,-1
10194: fe079ee3 bnez a5,10190 <main+0xc>
10198: 00001637 lui a2,0x1
1019c: 3ba00613 addi a2,a2,954 # 13ba <register_fini-0xecf6>
101a0: 00400593 li a1,100
101a4: 00021537 lui a0,0x21
101a8: 19050513 addi a0,a0,400 # 21190 <__clzdi2+0x40>
101ac: 26c000ef jal ra,10418 <printf>
101b0: 00000513 li a0,0
101b4: 00813083 ld ra,8(sp)
101b8: 01010113 addi sp,sp,16
101bc: 00008067 ret
0000000000101c0 <atexit>:
101c0: 00050593 mv a1,a0
101c4: 00000693 li a3,0
101c8: 00000613 li a2,0
101cc: 00000513 li a0,0
101d0: 4390206f j 12e08 <__register_exitproc>
0000000000101d4 <exit>:
101d4: ff010113 addi sp,sp,-16
101d8: 00000593 li a1,0
101dc: 00813023 sd s0,0(sp)
101e0: 00113423 sd ra,8(sp)
101e4: 00050413 mv s0,a0
101e8: 4cd020ef jal ra,12eb4 <__call_exitprocs>
101ec: 74818793 addi a5,gp,1864 # 23150 <_global_inpure_ptr>
101f0: 0007b503 ld a0,0(a5)
101f4: 05853783 ld a5,88(a0)
101f8: 00078463 beqz a5,10200 <exit+0x2c>
101fc: 000780e7 jalr a5
10200: 00040513 mv a0,s0
10204: 7410e0ef jal ra,1f144 <_exit>
000000000010208 <__libc_fini_array>:
10208: fe010113 addi sp,sp,-32
1020c: 00813023 sd s0,16(sp)
```