```
umiton.o:       file format elf64-littleriscv


Disassembly of section .text:

0000000000100b0 <register_fini>:
   100b0:       ffff0797                aulpc   a5,0xffff0
   100b4:       f5078793                addi    a5,a5,-176 # 0 <register_fini-0x100b0>
   100b8:       00078863                beqz    a5,100c8 <register_fini+0x18>
   100bc:       00000517                aulpc   a0,0x0
   100c0:       19c50513                addi    a0,a0,412 # 10258 <__libc_fini_array>
   100c4:       14c0006f                j       10210 <atexit>
   100c8:       00008067                ret

00000000000100cc <_start>:
   100cc:       00013197                aulpc   gp,0x13
   100d0:       93c18193                addi    gp,gp,-1732 # 22a08 <__global_pointer$>
   100d4:       77818513                addi    a0,gp,1904 # 23178 <_edata>
   100d8:       00013617                aulpc   a2,0x13
   100dc:       13060613                addi    a2,a2,304 # 23208 <__BSS_END__>
   100e0:       40a60633                sub     a2,a2,a0
   100e4:       00000593                li      a1,0
   100e8:       260000ef                jal     ra,10348 <memset>
   100ec:       00000517                aulpc   a0,0x0
   100f0:       16c50513                addi    a0,a0,364 # 10258 <__libc_fini_array>
   100f4:       11c000ef                jal     ra,10210 <atexit>
   100f8:       1bc000ef                jal     ra,102b4 <__libc_init_array>
   100fc:       00012503                lw      a0,0(sp)
   10100:       00810593                addi    a1,sp,8
   10104:       00000613                li      a2,0
   10108:       07c000ef                jal     ra,10184 <main>
   1010c:       118000ef                j       10224 <exit>

0000000000010110 <__do_global_dtors_aux>:
   10110:       7981c783                lbu     a5,1944(gp) # 231a0 <completed.5468>
   10114:       04079463                bnez    a5,1015c <__do_global_dtors_aux+0x4c>
   10118:       ffff0797                aulpc   a5,0xffff0
   1011c:       ee878793                addi    a5,a5,-280 # 0 <register_fini-0x100b0>
   10120:       02078863                beqz    a5,10150 <__do_global_dtors_aux+0x40>
   10124:       ff010113                addi    sp,sp,-16
   10128:       00012517                aulpc   a0,0x12
   1012c:       ed850513                addi    a0,a0,-296 # 22000 <__FRAME_END__>
   10130:       00113423                sd      ra,8(sp)
   10134:       00000097                aulpc   ra,0x0
   10138:       000000e7                jalr    zero # 0 <register_fini-0x100b0>
   1013c:       00813083                ld      ra,8(sp)
   10140:       00100793                li      a5,1
   10144:       78f18c23                sb      a5,1944(gp) # 231a0 <completed.5468>
   10148:       01010113                addi    sp,sp,16
```

```
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ gcc sum1ton.c
vsduser@vsduser-VirtualBox:~$ ./a.out
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ spike pk sum1ton.o
bbl loader
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ []
```

```
vsduser@vsduser-VirtualBox:~$ cat sum1ton.c
#include <stdio.h>

int main() {
int i, sum=0, n=7;
for(i=1; i<=n; ++i){
sum += i;
}
printf("sum of numbers from 1 to %d is %d\n",n,sum);
return 0;
}
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -o1 -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
```

```
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ gcc sum1ton.c
vsduser@vsduser-VirtualBox:~$ ./a.out
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ spike pk sum1ton.o
bbl loader
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ spike -d pk sum1ton.o
(spike) until pc 0 100b0
bbl loader
(spike) reg 0 a5
0x00000000000100b0
(spike)
core   0: 0x00000000000100b0 (0xffff0797) auipc   a5, 0xffff0
(spike) reg 0 a5
0x00000000000000b0
(spike)
core   0: 0x00000000000100b4 (0xf5078793) addi    a5, a5, -176
(spike) reg 0 a5
0x0000000000000000
(spike)
core   0: 0x00000000000100b8 (0x00078863) beqz    a5, pc + 16
(spike) reg 0 sp
0x0000003ffffffb30
(spike) q
vsduser@vsduser-VirtualBox:~$ spike -d pk sum1ton.o
(spike) untill pc 0 100b8
Unknown command untill
(spike) until pc 0 100b8
bbl loader
(spike) reg 0 sp
0x0000003ffffffb30
(spike)
```

```
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ gcc sum1ton.c
vsduser@vsduser-VirtualBox:~$ ./a.out
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ riscv64-unknown-elf-gcc -ofast -mabi=lp64 -march=rv64i -o sum1ton.o sum1ton.c
vsduser@vsduser-VirtualBox:~$ spike pk sum1ton.o
bbl loader
sum of numbers from 1 to 7 is 28
vsduser@vsduser-VirtualBox:~$ spike -d pk sum1ton.o
(spike) until pc 0 100b0
bbl loader
(spike) reg 0 a2
0x0000000000000000
(spike)
core   0: 0x00000000000100b0 (0xffff0797) auipc   a5, 0xffff0
(spike) reg 0 a5
0x00000000000000b0
(spike)
core   0: 0x00000000000100b4 (0xf5078793) addi    a5, a5, -176
(spike) reg 0 a5
0x0000000000000000
(spike) reg 0 a0
0x0000000000000000
(spike) reg 0 a5 a5
0xBad or missing arguments for command reg
(spike) reg 0 a5,a5
0xBad or missing arguments for command reg
(spike) reg 0 a5
0x0000000000000000
(spike) reg 0 a5
0x0000000000000000
(spike)
core   0: 0x00000000000100b8 (0x00078863) beqz    a5, pc + 16
(spike) q
vsduser@vsduser-VirtualBox:~$ spike -d pk sum1ton.o
(spike) until pc 0 100b8
bbl loader
(spike) reg 0 sp
0x0000003fffffffb30
(spike)
core   0: 0x00000000000100b8 (0x00078863) beqz    a5, pc + 16
(spike)
```