

challenge\_level3 > random\_test > ! rv32i.yaml

```
17 # General directives to aapg
18 # Options:
19 #     total_instructions: Approximate number of instructions to be generated
20 #                         by aapg. Actual may vary.
21 #     regs_not_use:      Comma separated list of RISC-V registers to not use for
22 #                         reading/writing in the random generated instructions
23 #
24 # -----
25 general:
26     total_instructions: 100
27     regs_not_use: x1,x2
28     custom_trap_handler: true
29     code_start_address: 0x80000000
30     default_program_exit: true
31     delegation: 0x0
32
33 # -----
34 # Distribution of instructions according to ISA extensions
35 # Specify the relative frequency of each set
36 # E.g. : A relative frequency of 1 each means each instruction will be
37 # generated equal number of times in the total instructions. Specify 0 to disable.
38 # -----
39 isa-instruction-distribution:
40     rel_sys: 0
41     rel_sys.csr: 10
42     rel_rv32i.ctrl: 5
43     rel_rv32i.compute: 60
44     rel_rv32i.data: 25
45     rel_rv32i.fence: 0
46     rel_rv64i.compute: 0
47     rel_rv64i.data: 0
48     rel_rv32i.zba: 0
49     rel_rv64i.zba: 0
50     rel_rv32i.zbb: 0
51     rel_rv64i.zbb: 0
52     rel_rv32i.zbc: 0
53     rel_rv32i.zbs: 0
54     rel_rv32i.zbe: 0
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

directed\_test model\_setup.sh random\_test riscv riscv dv coverage

- root@codespaces-f78f75:/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge\_level3# cd directed\_test
- root@codespaces-f78f75:/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge\_level3/directed\_test# ls  
Makefile app log boot.LSB boot.MSB code mem common riscv buggy ctrl dump signature spike dump temp

challenge\_level3 > random\_test > test.disass

```
503 80000624: 27bceb93      ori s7,s> srl
504 80000628: 1f815183      lhu gp,504(sp)
505 8000062c: a44106a3      sb tp,-1459(sp)
506 80000630: 27ce6bf3      csrrsi s7,0x27c,28
507
508 80000634 <b00000000027>:
509 80000634: 00000033      add zero,zero,zero
510 80000638: 05de5863      bge t3,t4,80000688 <i00000000031>
511 8000063c: 00000033      add zero,zero,zero
512 80000640: 8ee11383      lh t2,-1810(sp)
513 80000644: 403b8a33      sub s4,s7,gp
514 80000648: bb973773      csrrc a4,0xbb9,a4
515 8000064c: 7c88abf3      csrrs s7,0x7c8,a7
516 80000650: 63a564f3      csrrsi s1,0x63a,10
517 80000654: 00a25393      srli t2,tp,0xa
518 80000658: 4b2e3797      auipc a5,0x4b2e3
519 8000065c: 00a00e93      li t4,10
520
521 80000660 <i00000000027>:
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
912c912
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
> 3 0x80000468 (0x05012a03) x20 0x338b21e9
915c915
< 3 0x80000474 (0x05c12b83) x23 0x338b62e9
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
991c991
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
> 3 0x80000468 (0x05012a03) x20 0x338b21e9
994c994
< 3 0x80000474 (0x05c12b83) x23 0x338b62e9
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
1009c1009
< 3 0x80000664 (0x0143e9b3) x19 0x33ab25d5
---
> 3 0x80000664 (0x0143e9b3) x19 0x33ab25eb
1103,1104c1103,1104
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
```

challenge\_level3 > random\_test > test.disass

```
469 800005cc: b5a10183 lb gp, -> srl
470
471 800005d0 <i00000000021>:
472 800005d0: 72df4b93 xori s7,t5,1837
473
474 800005d4 <i00000000022>:
475 800005d4: 00ca1db3 sll s11,s4,a2
476
477 800005d8 <i00000000023>:
478 800005d8: 003b5f33 srl t5,s6,gp
479
480 800005dc <i00000000024>:
481 800005dc: 33001fb7 lui t6,0x33001
482
483 800005e0 <i00000000025>:
484 800005e0: 851f7013 andi zero,t5,-1967
485 800005e4: 00091117 auipc sp,0x91
486 800005e8: a1c10113 addi sp,sp,-1508 # 80091000 <begin_signature>
487 800005ec: 00001337 lui t1,0x1
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
1806c1806
< 3 0x80000448 (0x03012603) x12 0x00000590
---
> 3 0x80000448 (0x03012603) x12 0x00000599
1813c1813
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
---
> 3 0x80000464 (0x04c12983) x19 0x33ab25eb
1815c1815
< 3 0x8000046c (0x05412a83) x21 0x00000368
---
> 3 0x8000046c (0x05412a83) x21 0xfffffffffa
1890c1890
< 3 0x80000448 (0x03012603) x12 0x00000590
---
> 3 0x80000448 (0x03012603) x12 0x00000599
1897c1897
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
---
> 3 0x80000464 (0x04c12983) x19 0x33ab25eb
1899c1899
< 3 0x8000046c (0x05412a83) x21 0x00000368
---
> 3 0x8000046c (0x05412a83) x21 0xfffffffffa
1916c1916
< 3 0x800007fc (0xbacea93) x21 0xffffffffch6
```



challenge\_level3 > random\_test > test.disass

```
670 80000780: 00610133      add sp,s
671 80000784: 83ccbdf3      csrrc s1
672 80000788: 2b711f23      sh s7,702(sp)
673 8000078c: 0073aab3      slt s5,t2,t2
674 80000790: 40740c33      sub s8,s0,t2
675 80000794: a019b713      sltiu a4,s3,-1535
676 80000798: 01bb98b3      sll a7,s7,s11
677 8000079c: 1e7103a3      sb t2,487(sp)
678
679 800007a0 <b0000000004d>:
680 800007a0: 00000033      add zero,zero,zero
681 800007a4: fbd952e3      bge s2,t4,80000748 <i00000000044>
682 800007a8: 00000033      add zero,zero,zero
683 800007ac: 017dddb3      srl s11,s11,s7
684 800007b0: 8870e873      csrrsi a6,0x887,1
685 800007b4: c76100a3      sb s6,-927(sp)
686 800007b8: 4d710523      sb s7,1226(sp)
687 800007bc: 66c8bbf3      csrrc s7,0x66c,a7
688 800007c0: 0d912a23      sw s9,212(sp)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
< 3 0x800007ac (0x017dddb3) x27 0x6c86c134
---
> 3 0x800007ac (0x017dddb3) x27 0x6c86d1bd
1617c1617
< 3 0x80000448 (0x03012603) x12 0x00000590
---
> 3 0x80000448 (0x03012603) x12 0x00000599
1624c1624
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
---
> 3 0x80000464 (0x04c12983) x19 0x33ab25eb
1632c1632
< 3 0x80000484 (0x06c12d83) x27 0x6c86c134
---
> 3 0x80000484 (0x06c12d83) x27 0x6c86d1bd
1698c1698
< 3 0x80000448 (0x03012603) x12 0x00000590
---
> 3 0x80000448 (0x03012603) x12 0x00000599
1705c1705
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
---
> 3 0x80000464 (0x04c12983) x19 0x33ab25eb
1713c1713
< 3 0x80000484 (0x06c12d83) x27 0x6c86c134
---
```

challenge\_level3 > random\_test > test.disass

```
512 80000640: 8ee11383      lh  t2,-> 80000664
513 80000644: 403b8a33      sub s4,s3,s4
514 80000648: bb973773      csrrc a4,0xbb9,a4
515 8000064c: 7c88abf3      csrrs s7,0x7c8,a7
516 80000650: 63a564f3      csrrsi s1,0x63a,10
517 80000654: 00a25393      srli t2,tp,0xa
518 80000658: 4b2e3797      auipc a5,0x4b2e3
519 8000065c: 00a00e93      li  t4,10
520
521 80000660 <i00000000027>:
522 80000660: 02e15203      lhu tp,46(sp)
523
524 80000664 <i00000000028>:
525 80000664: 0143e9b3      or  s3,t2,s4
526
527 80000668 <i00000000029>:
528 80000668: b6b11923      sh  a1,-1166(sp)
529
530 8000066c <i0000000002a>:
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
912c912
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
> 3 0x80000468 (0x05012a03) x20 0x338b21e9
915c915
< 3 0x80000474 (0x05c12b83) x23 0x338b62e9
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
991c991
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
> 3 0x80000468 (0x05012a03) x20 0x338b21e9
994c994
< 3 0x80000474 (0x05c12b83) x23 0x338b62e9
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
1009c1009
< 3 0x80000664 (0x0143e9b3) x19 0x33ab25d5
---
> 3 0x80000664 (0x0143e9b3) x19 0x33ab25eb
1103,1104c1103,1104
< 3 0x80000464 (0x04c12983) x19 0x33ab25d5
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
```



challenge\_level3 > random\_test > test.disass

```
494 80000600: 00a00e93      li t4,1
495 80000604: 00091117      auipc sp,
496 80000608: 9fc10113      addi sp,sp,-1540 # 80091000 <begin_signature>
497 8000060c: 00001337      lui t1,0x1
498 80000610: 13830313      addi t1,t1,312 # 1138 <_tbss_end+0x1138>
499 80000614: 00610133      add sp,sp,t1
500 80000618: 3a14abf3      csrrs s7,pmpcfg1,s1
501 8000061c: f0d10183      lb gp,-243(sp)
502 80000620: d6d10b83      lb s7,-659(sp)
503 80000624: 27bceb93      ori s7,s9,635
504 80000628: 1f815183      lhu gp,504(sp)
505 8000062c: a44106a3      sb tp,-1459(sp)
506 80000630: 27ce6bf3      csrrsi s7,0x27c,28
507
508 80000634 <b0000000027>:
509 80000634: 00000033      add zero,zero,zero
510 80000638: 05de5863      bge t3,t4,80000688 <i00000000031>
511 8000063c: 00000033      add zero,zero,zero
512 80000640: 8ee11383      lh t2,-1810(sp)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
566c566
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
645c645
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
681c681
< 3 0x80000624 (0x27bceb93) x23 0x338b62e9
---
> 3 0x80000624 (0x27bceb93) x23 0x338b62fb
752c752
< 3 0x80000474 (0x05c12b83) x23 0x338b62e9
---
> 3 0x80000474 (0x05c12b83) x23 0x338b62fb
767c767
< 3 0x80000644 (0x403b8a33) x20 0x338b21d7
---
> 3 0x80000644 (0x403b8a33) x20 0x338b21e9
833c833
< 3 0x80000468 (0x05012a03) x20 0x338b21d7
---
> 3 0x80000468 (0x05012a03) x20 0x338b21e9
836c836
```

challenge\_level3 > random\_test > test.disass

```
305 8000045c: 04412883 lw a7,6
306 80000460: 04812903 lw s2,7
307 80000464: 04c12983 lw s3,76(sp)
308 80000468: 05012a03 lw s4,80(sp)
309 8000046c: 05412a83 lw s5,84(sp)
310 80000470: 05812b03 lw s6,88(sp)
311 80000474: 05c12b83 lw s7,92(sp)
312 80000478: 06012c03 lw s8,96(sp)
313 8000047c: 06412c83 lw s9,100(sp)
314 80000480: 06812d03 lw s10,104(sp)
315 80000484: 06c12d83 lw s11,108(sp)
316 80000488: 07012e03 lw t3,112(sp)
317 8000048c: 07412e83 lw t4,116(sp)
318 80000490: 07812f03 lw t5,120(sp)
319 80000494: 07c12f83 lw t6,124(sp)
320 80000498: 0a010113 addi sp,sp,160
321 8000049c: 30200073 mret
322
323 800004a0 <func1>:
```

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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
318c318
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
405c405
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
486c486
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
566c566
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
645c645
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
681c681
< 3 0x80000624 (0x27bceb93) x23 0x338b62e9
---
> 3 0x80000624 (0x27bceb93) x23 0x338b62fh
```



challenge\_level3 > random\_test > test.disass

```
305 8000045c: 04412883 lw a7,6
306 80000460: 04812903 lw s2,7
307 80000464: 04c12983 lw s3,76(sp)
308 80000468: 05012a03 lw s4,80(sp)
309 8000046c: 05412a83 lw s5,84(sp)
310 80000470: 05812b03 lw s6,88(sp)
311 80000474: 05c12b83 lw s7,92(sp)
312 80000478: 06012c03 lw s8,96(sp)
313 8000047c: 06412c83 lw s9,100(sp)
314 80000480: 06812d03 lw s10,104(sp)
315 80000484: 06c12d83 lw s11,108(sp)
316 80000488: 07012e03 lw t3,112(sp)
317 8000048c: 07412e83 lw t4,116(sp)
318 80000490: 07812f03 lw t5,120(sp)
319 80000494: 07c12f83 lw t6,124(sp)
320 80000498: 0a010113 addi sp,sp,160
321 8000049c: 30200073 mret
322
323 800004a0 <func1>:
```

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1 of 1

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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
riscv32-unknown-elf-objdump -D test.elf > test.disass
[UpTickPro] Spike Run -----
#spike --isa=rv32i test.elf
#spike -l --isa=rv32i +signature=test_spike_signature.log test.elf
/tools/mod_spike/bin/spike --isa=rv32i test.elf
/tools/mod_spike/bin/spike -c --isa=rv32i +signature=test_spike_signature.log test.elf
[UpTickPro] Simulation -----
elf2hex 4 8388608 test.elf 2147483648 > code.mem
./riscv_buggy
- verilog//mkTbSoc.v:2829: Verilog $finish
head -n -4 rtl.dump > temp.dump
cp temp.dump rtl.dump
[UpTickPro] Comparison -----
diff rtl.dump spike.dump
155c155
< 3 0x800004fc (0xf12dee13) x28 0xde1d7992
---
> 3 0x800004fc (0xf12dee13) x28 0xffffffff92
238c238
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
318c318
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
```



challenge\_level3 > random\_test > test.disass

```
351 800004ec: 20030313      addi t1,0
352 800004f0: 00610133      add sp,s11
353
354 800004f4 <i000000000003>:
355 800004f4: c0011603      lh a2,-1024(sp)
356
357 800004f8 <i000000000004>:
358 800004f8: 8f412d83      lw s11,-1804(sp)
359
360 800004fc <i000000000005>:
361 800004fc: f12dee13      ori t3,s11,-238
362
363 80000500 <i000000000006>:
364 80000500: eb011403      lh s0,-336(sp)
365
366 80000504 <i000000000007>:
367 80000504: 736db593      sltiu a1,s11,1846
368 80000508: 00091117      auipc sp,0x91
369 8000050c: af810113      addi sp,sp,-1288 # 80091000 <begin_signature>
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
riscv32-unknown-elf-objdump -D test.elf > test.disass
[UpTickPro] Spike Run -----
#spike --isa=rv32i test.elf
#spike -l --isa=rv32i +signature=test_spike_signature.log test.elf
/tools/mod_spike/bin/spike --isa=rv32i test.elf
/tools/mod_spike/bin/spike -c --isa=rv32i +signature=test_spike_signature.log test.elf
[UpTickPro] Simulation -----
elf2hex 4 8388608 test.elf 2147483648 > code.mem
./riscv_buggy
- verilog//mkTbSoc.v:2829: Verilog $finish
head -n -4 rtl.dump > temp.dump
cp temp.dump rtl.dump
[UpTickPro] Comparison -----
diff rtl.dump spike.dump
155c155
< 3 0x800004fc (0xf12dee13) x28 0xde1d7992
---
> 3 0x800004fc (0xf12dee13) x28 0xffffffff92
238c238
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
318c318
< 3 0x80000488 (0x07012e03) x28 0xde1d7992
---
> 3 0x80000488 (0x07012e03) x28 0xffffffff92
```

challenge\_level3 > random\_test > test.disass

```
1591 80000fc0 <i00000000107>:
1592 80000fc0: 00745333          srl t1,
1593
1594 80000fc4 <i00000000108>:
1595 80000fc4: 0031f7b3          and a5,gp,gp
1596
1597 80000fc8 <i00000000109>:
1598 80000fc8: 83211223          sh s2,-2012(sp)
1599
1600 80000fcc <i0000000010a>:
1601 80000fcc: cd296813          ori a6,s2,-814
1602 80000fd0: 00090117          auipc sp,0x90
1603 80000fd4: 03010113          addi sp,sp,48 # 80091000 <begin_signature>
1604 80000fd8: 00003337          lui t1,0x3
1605 80000fdc: 3e830313          addi t1,t1,1000 # 33e8 <_tbss_end+0x33e8>
1606 80000fe0: 00610133          add sp,sp,t1
1607 80000fe4: 121ee7f3          csrksi a5,0x121,29
1608 80000fe8: af210ba3          sb s2,-1289(sp)
1609 80000fec: 40949973          csrrw s2,0x409,s1
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
---
> 3 0x80000f94 (0x003de933) x18 0xffffbfff
8563c8485
< 3 0x80000fcc (0xcd296813) x16 0x2fa94ddf
---
> 3 0x80000fcc (0xcd296813) x16 0xffffffff
8630c8552
< 3 0x80000458 (0x04012803) x16 0x2fa94ddf
---
> 3 0x80000458 (0x04012803) x16 0xffffffff
8632c8554
< 3 0x80000460 (0x04812903) x18 0xd056b10d
---
> 3 0x80000460 (0x04812903) x18 0xffffbfff
8710c8632
< 3 0x80000458 (0x04012803) x16 0x2fa94ddf
---
> 3 0x80000458 (0x04012803) x16 0xffffffff
8712c8634
< 3 0x80000460 (0x04812903) x18 0xd056b10d
---
> 3 0x80000460 (0x04812903) x18 0xffffbfff
8738,8739c8660,8661
< 3 0x80001088 (0xff85e193) x 3 0xfffc4e7
< 3 0x8000108c (0x835be193) x 3 0xffff834
---
```

challenge\_level3 > random\_test > test.disass

```
281 8000040c: 00561663      bne a2, > 80000428 | 1 of 1
282
283 80000410 <inst32>:
284 80000410: 00458593      addi a1,a1,4
285 80000414: 00000463      beqz zero,8000041c <inst16+0x4>
286
287 80000418 <inst16>:
288 80000418: 00258593      addi a1,a1,2
289 8000041c: 34159073      csrw mepc,a1
290 80000420: 00412083      lw ra,4(sp)
291 80000424: 00c12183      lw gp,12(sp)
292 80000428: 01012203      lw tp,16(sp)
293 8000042c: 01412283      lw t0,20(sp)
294 80000430: 01812303      lw t1,24(sp)
295 80000434: 01c12383      lw t2,28(sp)
296 80000438: 02012403      lw s0,32(sp)
297 8000043c: 02412483      lw s1,36(sp)
298 80000440: 02812503      lw a0,40(sp)
299 80000444: 02c12583      lw a1,44(sp)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12911c12599
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
12974c12662
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
---
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12993c12681
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13055c12743
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
---
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
13074c12762
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13085c12773
< 3 0x800017d8 (0x3a5bed93) x27 0xc43a4402
---
> 3 0x800017d8 (0x3a5bed93) x27 0x000003a5
make: *** [Makefile:33: sim] Error 1
```



challenge\_level3 > random\_test > test.disass

```
2549
2550 800017bc <b00000001dc>:
2551 800017bc: 00000033      add zero,zero,zero
2552 800017c0: fbfe0ae3      beq t3,t6,80001774 <i00000001d3>
2553 800017c4: 00000033      add zero,zero,zero
2554 800017c8: 6c5b9c73      csrrw s8,0x6c5,s7
2555 800017cc: 98811d83      lh s11,-1656(sp)
2556 800017d0: 007d9913      slli s2,s11,0x7
2557 800017d4: f37db1f3      csrrc gp,0xf37,s11
2558 800017d8: 3a5bed93      ori s11,s7,933
2559 800017dc: f5215483      lhu s1,-174(sp)
2560 800017e0: 01290933      add s2,s2,s2
2561 800017e4: 00a00e13      li t3,10
2562 800017e8: 00100193      li gp,1
2563 800017ec: 000fff17      auipc t5,0xff
2564 800017f0: 803f2a23      sw gp,-2028(t5) # 80100000 <tohost>
2565 800017f4: 0000100f      fence.i
2566 800017f8: 00020fb7      lui t6,0x20
2567 800017fc: 00090f17      auipc t5,0x90
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12911c12599
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
...
> 3 0x80000474 (0x05c12b83) x23 0x00000000
12974c12662
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
...
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12993c12681
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
...
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13055c12743
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
...
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
13074c12762
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
...
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13085c12773
< 3 0x800017d8 (0x3a5bed93) x27 0xc43a4402
...
> 3 0x800017d8 (0x3a5bed93) x27 0x000003a5
make: *** [Makefile:33: sim] Error 1
```

challenge\_level3 > random\_test > test.disass

```
301 8000044c: 03412683 lw a3,
302 80000450: 03812703 lw a4,
303 80000454: 03c12783 lw a5,60(sp)
304 80000458: 04012803 lw a6,64(sp)
305 8000045c: 04412883 lw a7,68(sp)
306 80000460: 04812903 lw s2,72(sp)
307 80000464: 04c12983 lw s3,76(sp)
308 80000468: 05012a03 lw s4,80(sp)
309 8000046c: 05412a83 lw s5,84(sp)
310 80000470: 05812b03 lw s6,88(sp)
311 80000474: 05c12b83 lw s7,92(sp)
312 80000478: 06012c03 lw s8,96(sp)
313 8000047c: 06412c83 lw s9,100(sp)
314 80000480: 06812d03 lw s10,104(sp)
315 80000484: 06c12d83 lw s11,108(sp)
316 80000488: 07012e03 lw t3,112(sp)
317 8000048c: 07412e83 lw t4,116(sp)
318 80000490: 07812f03 lw t5,120(sp)
319 80000494: 07c12f83 lw t6,124(sp)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS

```
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12911c12599
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
12974c12662
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
---
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
12993c12681
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13055c12743
< 3 0x80000428 (0x01012203) x 4 0xf11b993a
---
> 3 0x80000428 (0x01012203) x 4 0xf11b9b7f
13074c12762
< 3 0x80000474 (0x05c12b83) x23 0xc43a47a7
---
> 3 0x80000474 (0x05c12b83) x23 0x00000000
13085c12773
< 3 0x800017d8 (0x3a5bed93) x27 0xc43a4402
---
> 3 0x800017d8 (0x3a5bed93) x27 0x000003a5
make: *** [Makefile:33: sim] Error 1
```



M Makefile M

! rv32i.yaml M

≡ test.disass X

□ ...

≡ r

challenge\_level3 &gt; random\_test &gt; ≡ test.disass

```
640 > 80000734 | Aa .ab .* 1 of 2 ↑ ↓ ≡ ×
641 80000708 <b00000000+u>:
642 80000708: 00000033      add zero,zero,zero
643 8000070c: fd5b10e3      bne s6,s5,800006cc <i00000000046>
644 80000710: 00000033      add zero,zero,zero
645 80000714: 418251b3      sra gp,tp,s8
646 80000718: 00875db3      srl s11,a4,s0
647 8000071c: 6dce6897      auipc a7,0x6dce6
648 80000720: 4039d9b3      sra s3,s3,gp
649 80000724: 01244033      xor zero,s0,s2
650 80000728: c13d2993      slti s3,s10,-1005
651 8000072c: 41a8d1b3      sra gp,a7,s10
652 80000730: 00a00b13      li s6,10
653
654 80000734 <i0000000004d>:
655 80000734: 01200ab3      add s5,zero,s2
656
657 80000738 <i0000000004e>:
658 80000738: 5787dd37      lui s10,0x5787d
659
660 8000073c <i0000000004f>:
661 8000073c: 010d2ab3      slt s5,s10,a6
662
663 80000740 <i00000000050>:
664 80000740: 0151cab3      xor s5,gp,s5
665
666 80000744 <i00000000051>:
667 80000744: 009d21b3      slt gp,s10,s1
668
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

COMMENTS

```
> 3 0x80000734 (0x01200ab3) x21 0xfabdb800
215c215
< 3 0x80000748 (0x01a95333) x 6 0x9aad3800
...
> 3 0x80000748 (0x01a95333) x 6 0xfabdb800
222c222
< 3 0x80000764 (0x01bdecb3) x25 0x00000000
...
> 3 0x80000764 (0x01bdecb3) x25 0xf235a800
243c243
< 3 0x80000764 (0x01bdecb3) x25 0x00000000
...
> 3 0x80000764 (0x01bdecb3) x25 0x0aff5800
make: *** [Makefile:33: sim] Error 1
```

o root@codespaces-f78f75:/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge\_level3/random\_test



M Makefile M

! rv32i.yaml M

≡ test.disass X

□ ...

≡ r

challenge\_level3 &gt; random\_test &gt; ≡ test.disass

353 800004dc: 436a3b93 &gt; 800004f4 Aa .ab .\* 1 of 2

↑ ↓ ≡ ×

```
354
355 800004e0 <i000000000006>:
356 800004e0: abe43193          sltiu gp,s0,-1346
357
358 800004e4 <i000000000007>:
359 800004e4: 40b2d9b3          sra s3,t0,a1
360
361 800004e8 <i000000000008>:
362 800004e8: 3659cb93          xori s7,s3,869
363
364 800004ec <i000000000009>:
365 800004ec: 012ad5b3          srl a1,s5,s2
366
367 800004f0 <i00000000000a>:
368 800004f0: 01b53333          sltu t1,a0,s11
369
370 800004f4 <i00000000000b>:
371 800004f4: 4001dab3          sra s5,gp,zero
372
373 800004f8 <i00000000000c>:
374 800004f8: 0f333a93          sltiu s5,t1,243
375
376 800004fc <i00000000000d>:
377 800004fc: 689894b7          lui s1,0x68989
378
379 80000500 <i00000000000e>:
380 80000500: 00b9e1b3          or gp,s3,a1
381
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

COMMENTS

```
---
> 3 0x8000052c (0x04c1ea93) x21 0xe654c35f
92c92
< 3 0x80000538 (0x0047ea33) x20 0xd10a8754
---
> 3 0x80000538 (0x0047ea33) x20 0xd11a8f54
97c97
< 3 0x800004ec (0x012ad5b3) x11 0x0000c869
---
> 3 0x800004ec (0x012ad5b3) x11 0x0001cca9
99c99
< 3 0x800004f4 (0x4001dab3) x21 0x6434e39d
---
> 3 0x800004f4 (0x4001dab3) x21 0xe654c35b
102,103c102,103
```

M Makefile M

! rv32i.yaml M

≡ test.disass X

□ ...

≡ r

challenge\_level3 &gt; random\_test &gt; ≡ test.disass

341 800004cc: 015b8033 &gt; 800004ed Aa .ab . \* 1 of 2

342

343 800004d0 &lt;i00000000002&gt;:

344 800004d0: 003da1b3 slt gp,s11,gp

345

346 800004d4 &lt;i00000000003&gt;:

347 800004d4: 01ac6433 or s0,s8,s10

348

349 800004d8 &lt;i00000000004&gt;:

350 800004d8: eb287d13 andi s10,a6,-334

351

352 800004dc &lt;i00000000005&gt;:

353 800004dc: 436a3b93 sltiu s7,s4,1078

354

355 800004e0 &lt;i00000000006&gt;:

356 800004e0: abe43193 sltiu gp,s0,-1346

357

358 800004e4 &lt;i00000000007&gt;:

359 800004e4: 40b2d9b3 sra s3,t0,a1

360

361 800004e8 &lt;i00000000008&gt;:

362 800004e8: 3659cb93 xori s7,s3,869

363

364 800004ec &lt;i00000000009&gt;:

365 800004ec: 012ad5b3 srl a1,s5,s2

366

367 800004f0 &lt;i0000000000a&gt;:

368 800004f0: 01b53333 sltu t1,a0,s11

369

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

COMMENTS

---

> 3 0x8000052c (0x04c1ea93) x21 0xe654c35f  
92c92

&lt; 3 0x80000538 (0x0047ea33) x20 0xd10a8754

---

> 3 0x80000538 (0x0047ea33) x20 0xd11a8f54  
97c97

&lt; 3 0x800004ec (0x012ad5b3) x11 0x0000c869

---

> 3 0x800004ec (0x012ad5b3) x11 0x0001cca9  
99c99

&lt; 3 0x800004f4 (0x4001dab3) x21 0x6434e39d

---

> 3 0x800004f4 (0x4001dab3) x21 0xe654c35b  
102,103c102,103



Makefile M

! rv32i.yaml M

test.disass X

...

challenge\_level3 &gt; random\_test &gt; test.disass

```
384 > 80000524 Aa .ab .* 1 of 1 ↑ ↓ ≡ ×
385 80000508 <i0000000010>:
386 80000508: 01e85693 srli a3,a6,0x1e
387
388 8000050c <i0000000011>:
389 8000050c: 003af833 and a6,s5,gp
390
391 80000510 <i0000000012>:
392 80000510: ff7db993 sltiu s3,s11,-9
393
394 80000514 <i0000000013>:
395 80000514: bfee8593 addi a1,t4,-1026
396 80000518: 00c00f93 li t6,12
397 8000051c: 001b0b13 addi s6,s6,1
398 80000520: f2f1ae13 slti t3,gp,-209
399 80000524: 00e441b3 xor gp,s0,a4
400 80000528: 01420933 add s2,tp,s4
401 8000052c: 04c1ea93 ori s5,gp,76
402 80000530: 8929bc13 sltiu s8,s3,-1902
403 80000534: 07fe8b93 addi s7,t4,127
404 80000538: 0047ea33 or s4,a5,tp
405
406 8000053c <b0000000014>:
407 8000053c: 00000033 add zero,zero,zero
408 80000540: fbfb12e3 bne s6,t6,800004e4 <i0000000007>
409 80000544: 00000033 add zero,zero,zero
410 80000548: f4ddb193 sltiu gp,s11,-179
411 8000054c: 321668b7 lui a7,0x32166
412 80000550: 004789b3 add s3,a5,tp
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

COMMENTS

```
> 3 0x800004d4 (0x01ac6433) x 8 0xae fdf fcf
78,79c78,79
< 3 0x80000500 (0x00b9e1b3) x 3 0xc003d1c2
< 3 0x80000504 (0x419408b3) x17 0xdfbee80b
...
> 3 0x80000500 (0x00b9e1b3) x 3 0xc003d1f2
> 3 0x80000504 (0x419408b3) x17 0x621f08d1
87c87
< 3 0x80000524 (0x00e441b3) x 3 0x6434e39d
...
> 3 0x80000524 (0x00e441b3) x 3 0xe654c35b
89c89
< 3 0x8000052c (0x04c1ea93) x21 0x6434e3d1
...
> 3 0x8000052c (0x04c1ea93) x21 0xe654c35f
```



Makefile M

! rv32i.yaml M

test.disass X

...

challenge\_level3 &gt; random\_test &gt; test.disass

365 800004ec: 012ad5b3 &gt; 80000504 Aa .ab .\* 1 of 2

```
366
367 800004f0 <i0000000000a>:
368 800004f0: 01b53333          sltu  t1,a0,s11
369
370 800004f4 <i0000000000b>:
371 800004f4: 4001dab3          sra  s5,gp,zero
372
373 800004f8 <i0000000000c>:
374 800004f8: 0f333a93          sltiu s5,t1,243
375
376 800004fc <i0000000000d>:
377 800004fc: 689894b7          lui  s1,0x68989
378
379 80000500 <i0000000000e>:
380 80000500: 00b9e1b3          or   gp,s3,a1
381
382 80000504 <i0000000000f>:
383 80000504: 419408b3          sub  a7,s0,s9
384
385 80000508 <i00000000010>:
386 80000508: 01e85693          srli  a3,a6,0x1e
387
388 8000050c <i00000000011>:
389 8000050c: 003af833          and  a6,s5,gp
390
391 80000510 <i00000000012>:
392 80000510: ff7db993          sltiu s3,s11,-9
393
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

COMMENTS

```
head -n -4 rtl.dump > temp.dump
cp temp.dump rtl.dump
[UpTickPro] Comparison -----
diff rtl.dump spike.dump
67c67
< 3 0x800004d4 (0x01ac6433) x 8 0x2c9ddf09
---
> 3 0x800004d4 (0x01ac6433) x 8 0xaefffccf
78,79c78,79
< 3 0x80000500 (0x00b9e1b3) x 3 0xc003d1c2
< 3 0x80000504 (0x419408b3) x17 0xdfbee80b
---
> 3 0x80000500 (0x00b9e1b3) x 3 0xc003d1f2
> 3 0x80000504 (0x419408b3) x17 0x621f08d1
87c87
```

```
[INFO] - aapg.program_generator : Creating Prelude
[INFO] - aapg.program_generator : User functions received user-functions i_cache_thrash
[INFO] - aapg.gen_random_program : Program generation completed
[UpTickPro] Test Compilation -----
riscv32-unknown-elf-gcc -march=rv32i -mabi=ilp32 -static -mcmodel=medany -fvvisibility=hidden -nostdlib -nostartfiles -I/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge_level3/random_test/work/common -T/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge_level3/random_test/test.ld test.S /workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge_level3/random_test/work/common/crt.S -o test.elf
[UpTickPro] Test Disassembly -----
riscv32-unknown-elf-objdump -D test.elf > test.disass
[UpTickPro] Spike Run -----
spike --isa=rv32i test.elf
spike -c --isa=rv32i +signature=test_spike_signature.log test.elf
spike: unrecognized option -c
Try 'spike --help' for more information.
make: *** [Makefile:21: spike] Error 1
root@codespaces-f78f75:/workspaces/riscv-ctb-challenge-SudeepJoshi22/challenge_level3/random_test# spike --help
```