

Lab4 Report

一.实验内容

1.实现了 ADDIW SLLIW SRLIW SRAIW ADDW SUBW SLLW SRLW SRAW mul div divu rem remu 指令

```
t_c.o VSimTop_ALL.a -lpthread -lSDL2 -ldl -lz -lz -o /home/wy/Document/cpu-design/build/emu
rm VSimTop_ALL.verilator_deplist.tmp
make[4]: Leaving directory '/home/wy/Document/cpu-design/build/emu-compile'
make[3]: Leaving directory '/home/wy/Document/cpu-design/difftest'
make[2]: Leaving directory '/home/wy/Document/cpu-design/difftest'
make[1]: Leaving directory '/home/wy/Document/cpu-design'
TEST= ./build/emu --diff /home/wy/Document/cpu-design/ready-to-run/riscv64-nemu-interpreter-so -i ./ready-to-run/
test.bin --dump-wave || true
Emu compiled at Apr 7 2024, 20:22:30
The image is ./ready-to-run/lab4/lab4-test.bin
Using simulated 256MB RAM
Using /home/wy/Document/cpu-design/ready-to-run/riscv64-nemu-interpreter-so for difftest
[src/device/io/mmio.c:19,add_mmio_map] Add mmio map 'clint' at [0x38000000, 0x3800ffff]
[src/device/io/mmio.c:19,add_mmio_map] Add mmio map 'uartlite' at [0x40600000, 0x4060000c]
[src/device/io/mmio.c:19,add_mmio_map] Add mmio map 'uartlite1' at [0x23333000, 0x2333300f]
dump wave 0-999999 to /home/wy/Document/cpu-design/build/1712492551.fst...
The first instruction of core 0 has committed. Difftest enabled.
Pass!
[src/cpu/cpu-exec.c:393,cpu_exec] nemu: HIT GOOD TRAP at pc = 0x000000008000fef0
[src/cpu/cpu-exec.c:394,cpu_exec] trap code:0
[src/cpu/cpu-exec.c:74,monitor_statistic] host time spent = 4807 us
[src/cpu/cpu-exec.c:76,monitor_statistic] total guest instructions = 16249
[src/cpu/cpu-exec.c:77,monitor_statistic] simulation frequency = 3380278 instr/s
Program execution has ended. To restart the program, exit NEMU and run again.
sh: 1: spike-dasm: not found

===== Commit Group Trace (Core 0) =====
```

2.将执行延后一周期完成。然后实现了简单的乘除法器。有符号数在进行除法运算时，先转换成无符号数，然后根据被除数符号确定余数符号，根据被除数和除数符号是否一致确定商符号，最后进行转换。

二.展望

下次 lab 时使用状态机进一步重构，可能对乘除法进行优化。