Computer Architecture

Project (1)

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Testbench Idea:

Code in MIPS assembly:

```
lw $t0, 0($zero)          //t0=16
lw $t1, 4($zero)          //t1=5
add $t2, $t1, $t0         //t2=21
sub $t2, $t2, $t0         //t2=5
sw $t2, 0($zero)          //data_mem[0:3]=5
beq $t2, $t2, 4           // if(t2==t2) go to 4
1; nop
2; nop
3; nop
4; add $t1, $t1, $t1      //t1=10
```

The code tried to include all of the functions needed without much dependency on each other because of debugging issues

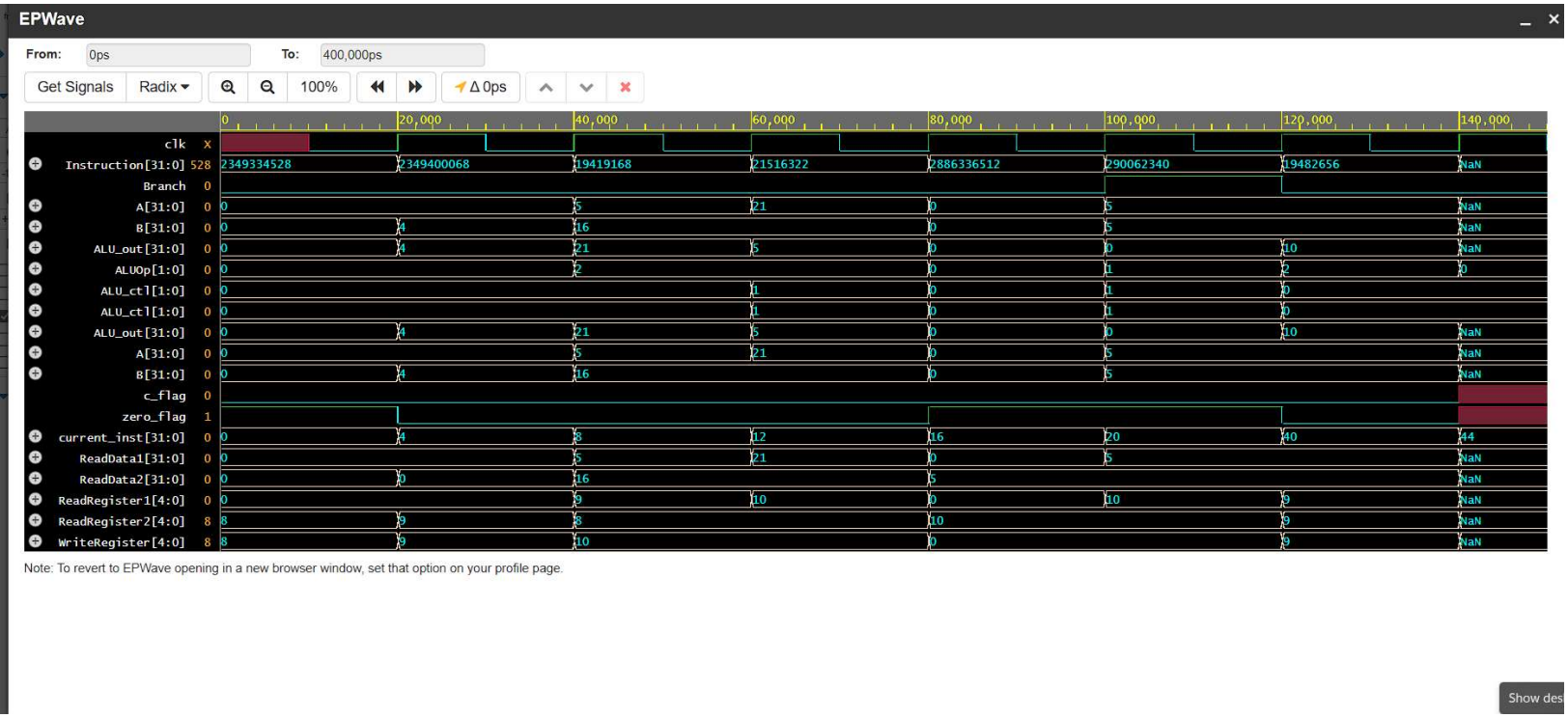
Data Memory before Function

Add[0]	0	0	0	16
Add[1]	0	0	0	5

Testbench Outcome:

```
KERNEL: Time: 0, PC: 00000000, instruction: 8c080000, $t0:          0, $t1:          0, $t2:          0, Mem[0:3]:         16, Mem[4:7]:          5
KERNEL: Time: 20000, PC: 00000004, instruction: 8c090004, $t0:         16, $t1:          0, $t2:          0, Mem[0:3]:         16, Mem[4:7]:          5
KERNEL: Time: 40000, PC: 00000008, instruction: 01285020, $t0:         16, $t1:          5, $t2:          0, Mem[0:3]:         16, Mem[4:7]:          5
KERNEL: Time: 60000, PC: 0000000c, instruction: 01485022, $t0:         16, $t1:          5, $t2:         21, Mem[0:3]:         16, Mem[4:7]:          5
KERNEL: Time: 80000, PC: 00000010, instruction: ac0a0000, $t0:         16, $t1:          5, $t2:          5, Mem[0:3]:          5, Mem[4:7]:          5
KERNEL: Time: 100000, PC: 00000014, instruction: 114a0004, $t0:         16, $t1:          5, $t2:          5, Mem[0:3]:          5, Mem[4:7]:          5
KERNEL: Time: 120000, PC: 00000028, instruction: 01294820, $t0:         16, $t1:          5, $t2:          5, Mem[0:3]:          5, Mem[4:7]:          5
```

Testbench Outcome:

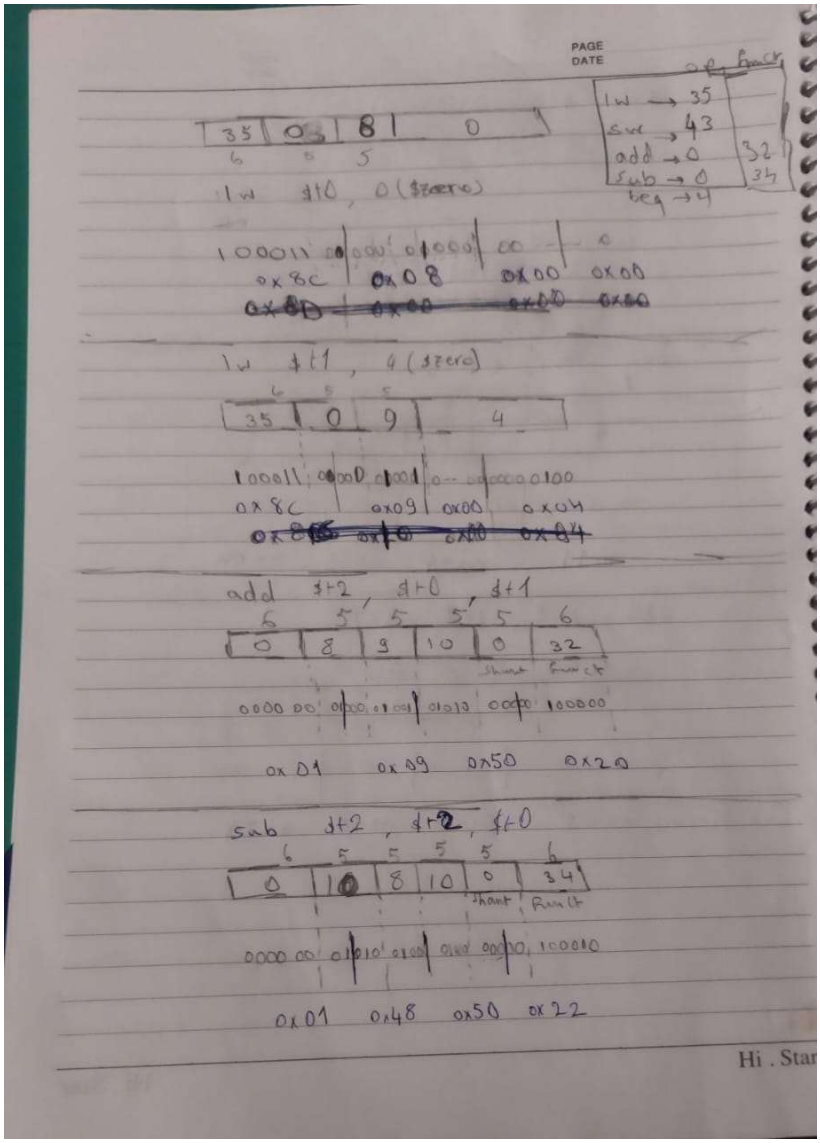


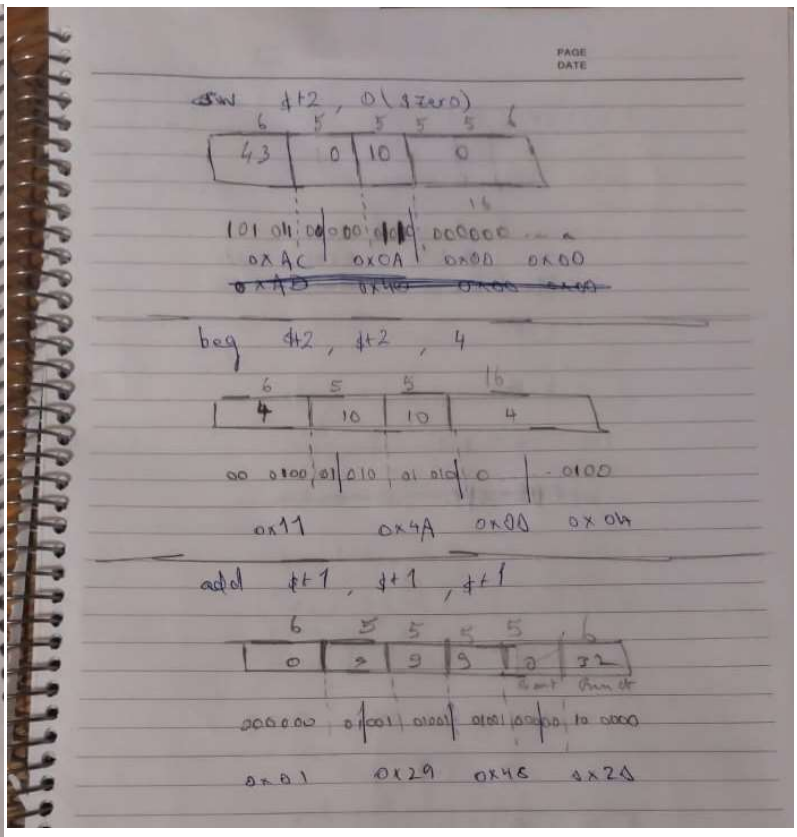
Data Memory After Function

Add[0]	0	0	0	5
Add[1]	0	0	0	5

APPENDIX:

Decoded to HEX:





Data Memory: