

The Program:

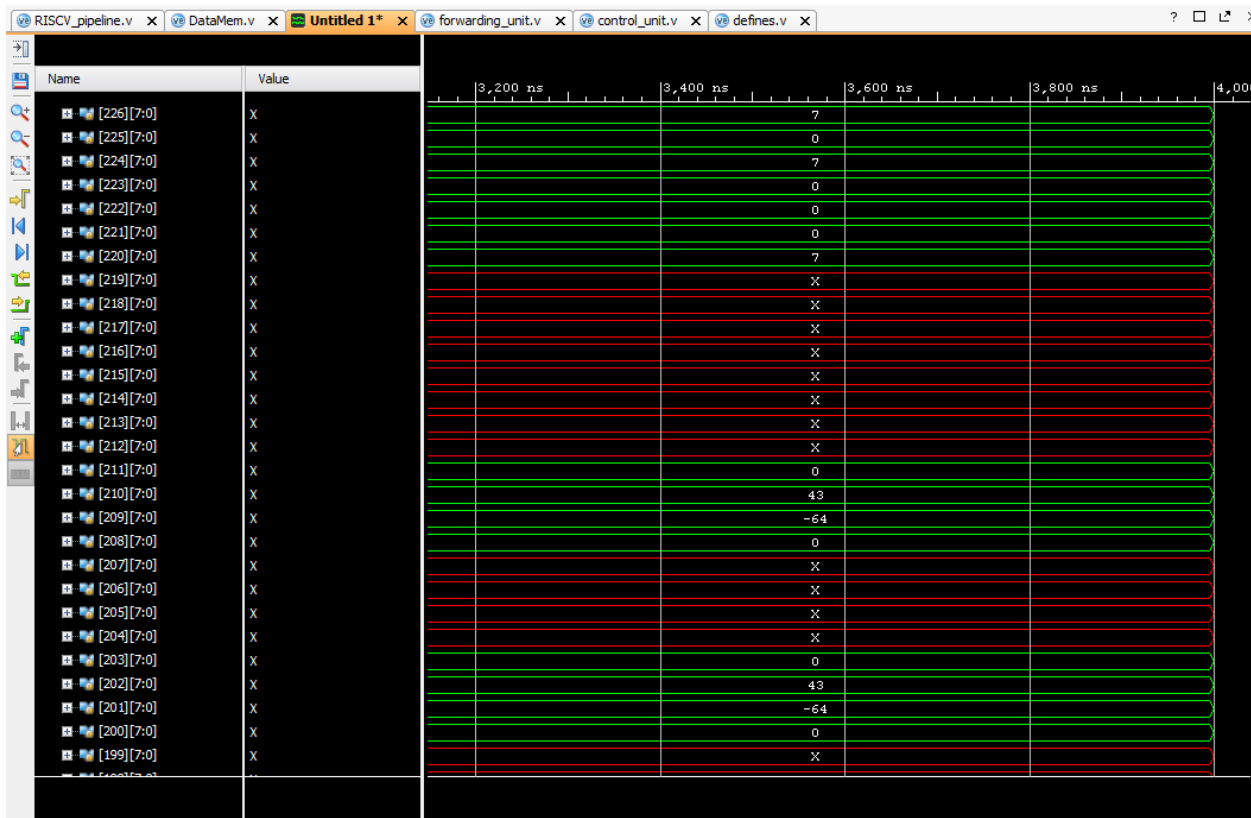
Machine Code	Basic Code	Original Code
0x00000013	addi x0 x0 0	addi x0, x0, 0
0x002bc0b7	lui x1 700	lui x1, 700
0x00102023	sw x1 0(x0)	sw x1, 0(x0)
0x00800113	addi x2 x0 8	addi x2, x0, 8
0x00112023	sw x1 0(x2)	sw x1, 0(x2)
0x000071b7	lui x3 7	lui x3, 7
0x003181b3	add x3 x3 x3	add x3, x3, x3
0x00f1f213	andi x4 x3 15	andi x4, x3, 15
0x00720293	addi x5 x4 7	addi x5, x4, 7
0x028000ef	jal x1 40	jal x1, L1
0x00502a23	sw x5 20(x0)	sw x5, 20(x0)
0x00501c23	sh x5 24(x0)	sh x5, 24(x0)
0x00500d23	sb x5 26(x0)	sb x5, 26(x0)
0x01402583	lw x11 20(x0)	lw x11, 20(x0)
0x01401603	lh x12 20(x0)	lh x12, 20(x0)
0x01405683	lhu x13 20(x0)	lhu x13, 20(x0)
0x01400703	lb x14 20(x0)	lb x14, 20(x0)
0x01404783	lbu x15 20(x0)	lbu x15, 20(x0)
0x000202b3	add x5 x4 x0	add x5, x4, x0

0x00520463	beq x4 x5 8	L1:beq x4, x5, Ex
0x00008067	jalr x0 x1 0	jalr x0, 0(x1)
0x00f00413	addi x8 x0 15	Ex: addi x8, x0,15
0x00a00393	addi x7 x0 10	addi x7, x0, 10
0x007444b3	xor x9 x8 x7	xor x9, x8, x7
0x00000073	ecall	ecall

Data Memory from Venus Simulator:

	Registers	Memory		
Address	+0	+1	+2	+3
0x00000018	7	0	7	0
0x00000014	7	0	0	0
0x00000010	0	0	0	0
0x0000000c	0	0	0	0
0x00000008	0	-64	43	0
0x00000004	0	0	0	0
0x00000000	0	-64	43	0

Data Memory Testing Results:



Register File from Venus Simulator:

Registers		Memory
zero	0	
ra (x1)	40	
sp (x2)	8	
gp (x3)	57344	
tp (x4)	0	
t0 (x5)	0	
t1 (x6)	0	
t2 (x7)	10	
s0 (x8)	15	
s1 (x9)	5	
a0 (x10)	0	
a1 (x11)	7	
a2 (x12)	7	
a3 (x13)	7	
a4 (x14)	7	
a5 (x15)	7	

Register File Testing Results:

[18][31:0]	0			0		
[17][31:0]	0			0		
[16][31:0]	0			0		
[15][31:0]	0			7		
[14][31:0]	0			7		
[13][31:0]	0			7		
[12][31:0]	0			7		
[11][31:0]	0			7		
[10][31:0]	0			0		
[9][31:0]	0			5		
[8][31:0]	0			15		
[7][31:0]	0			10		
[6][31:0]	0			0		
[5][31:0]	0			0		
[4][31:0]	0			0		
[3][31:0]	0			57344		
[2][31:0]	0			8		
[1][31:0]	0			40		
[0][31:0]	0			0		
memToReg[2:0]	0			0		
memOffset[2:0]	0			0		

Initialization Code:

initial begin

```
{mem[3],mem[2],mem[1],mem[0]}=32'h00000013;  
{mem[7],mem[6],mem[5],mem[4]}=32'h002bc0b7;  
{mem[11],mem[10],mem[9],mem[8]}=32'h0102023;  
{mem[15],mem[14],mem[13],mem[12]}=32'h00800113;  
{mem[19],mem[18],mem[17],mem[16]}=32'h00112023;  
{mem[23],mem[22],mem[21],mem[20]}=32'h000071b7;  
{mem[27],mem[26],mem[25],mem[24]}=32'h003181b3;  
{mem[31],mem[30],mem[29],mem[28]}=32'h00f1f213;  
{mem[35],mem[34],mem[33],mem[32]}=32'h00720293;  
{mem[39],mem[38],mem[37],mem[36]}=32'h028000ef;  
{mem[43],mem[42],mem[41],mem[40]}=32'h00502a23;  
{mem[47],mem[46],mem[45],mem[44]}=32'h00501c23;  
{mem[51],mem[50],mem[49],mem[48]}=32'h00500d23;  
{mem[55],mem[54],mem[53],mem[52]}=32'h01402583;  
{mem[59],mem[58],mem[57],mem[56]}=32'h01401603;  
{mem[63],mem[62],mem[61],mem[60]}=32'h01405683;  
{mem[67],mem[66],mem[65],mem[64]}=32'h01400703;  
{mem[71],mem[70],mem[69],mem[68]}=32'h01404783;  
{mem[75],mem[74],mem[73],mem[72]}=32'h000202b3;  
{mem[79],mem[78],mem[77],mem[76]}=32'h00520463;  
{mem[83],mem[82],mem[81],mem[80]}=32'h00008067;  
{mem[87],mem[86],mem[85],mem[84]}=32'h00f00413;  
{mem[91],mem[90],mem[89],mem[88]}=32'h00a00393;  
{mem[95],mem[94],mem[93],mem[92]}=32'h007444b3;  
{mem[99],mem[98],mem[97],mem[96]}=32'h00000073;
```

end