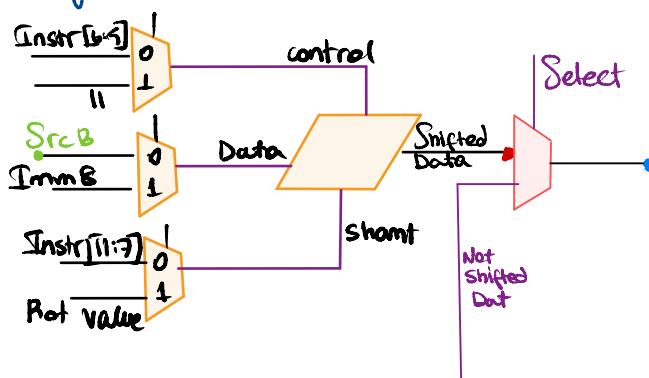


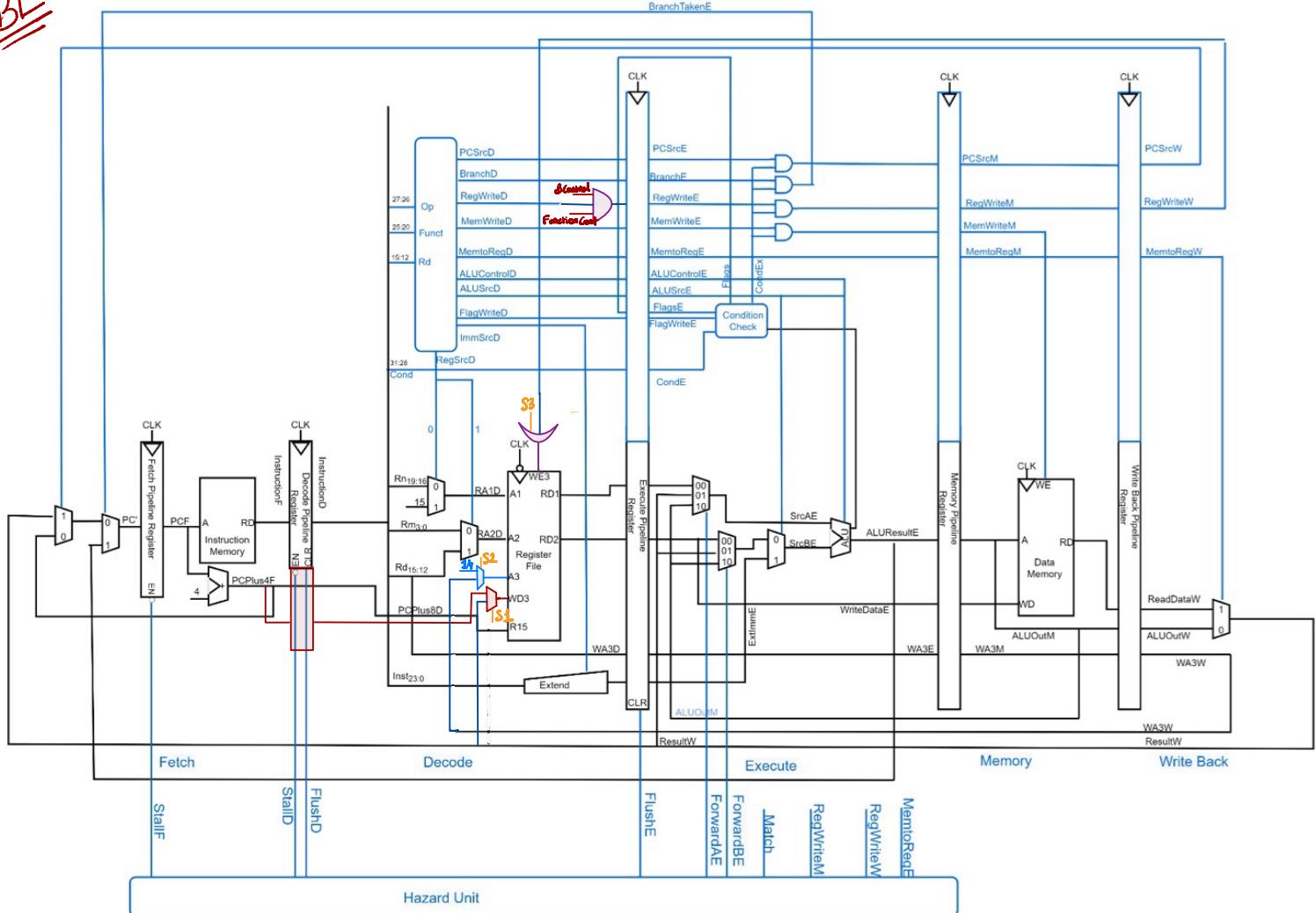
① made a change in the red point. I used 4 muxes and 1 shifter
 ① used three muxes for shifter and ① used other mux for BX data selection
 since BX has constant instruction, if ① do not use the last mux BX does not work properly



$$\text{Select} = (\text{Instruction}[24:21] == 1001)$$

this means when BX is called
 then directly get the RD2E which is
 destination address; otherwise, system works
 normal.

BL



I designed a little complex datapath for BL. Firstly I should mention that R14 is written on Execute cycle since it is easy to get PC+4. Second I use 2 mukes

$$S1 = S2 = S3 = L = (\text{InstructionD}[27:24] = 1011) \Rightarrow \text{which shows it is BL.}$$

Also I used AND gate for RegwriteD. If RegwriteD becomes 1 after Branch instruction, after a few steps ALUResult will be written to random register according to current Rd. In order to block this situation, I used this method.

$$\text{B Control} = (\text{op} == 10) \quad \text{Function Control} = (\text{Func} == 0010)$$

↓ Branch
Instruction
Detection

↓ BX detection

Hazard Unit

```
Match_1E_M = (RA1E == WA3M)
Match_1E_W = (RA1E == WA3W)
if (Match_1E_M • RegWriteM)
ForwardAE = 10; // SrcAE = ALUOutM
else if (Match_1E_W • RegWriteW)
ForwardAE = 01; // SrcAE = ResultW
else ForwardAE = 00; // SrcAE from regfile

Match_2E_M = (RA2E == WA3M)
Match_2E_W = (RA2E == WA3W)
if (Match_2E_M • RegWriteM)
ForwardBE = 10; // SrcBE = ALUOutM
else if (Match_2E_W • RegWriteW)
ForwardBE = 01; // SrcBE = ResultW
else ForwardBE = 00; // SrcBE from regfile
(SrcBE is selected from ExtImmE and regfile
with another MUX)

Match_12D_E = (RA1D == WA3E) + (RA2D == WA3E)
LDRstall = Match_12D_E • MemtoRegE
BranchTakenE = BranchE • CondEx

PCWrPendingF = PCSrcD + PCSrcE + PCSrcM; Fetch is stalled, Decode is Flushed
StallF = LDRstall + PCWrPendingF; Not asserted during PCSrcW to allow the write. Note
that this is asserted for 3 cycles continuously once the PCS=1 is decoded.
StallD = LDRstall
FlushD = PCWrPendingF + PCSrcW + BranchTakenE; Asserted as long as PC Write is going on
or Branch is taken
FlushE = LDRstall + BranchTakenE;
```

- I used Hazard unit that is written in Lecture notes
I did not make any changes.

CONTROLLER UNIT

I designed three modules to create controller unit.

Controller

This module creates signal according to Instructions.

Op : 00 Data Processing

Function Controller analyze BX signals in Data Processing

	0100 ADD	0010 SUB	0000 AND	1100 ORR	1101 mov	1010 CMP	1001 BX
ALU control	0100	0010	0000	1100	1101	0010	1101 => mov
RegWrite	1	1	1	1	1	0	0
FlagWrite	1	1	1	1	0	1	0
Branch	0	0	0	0	0	0	+

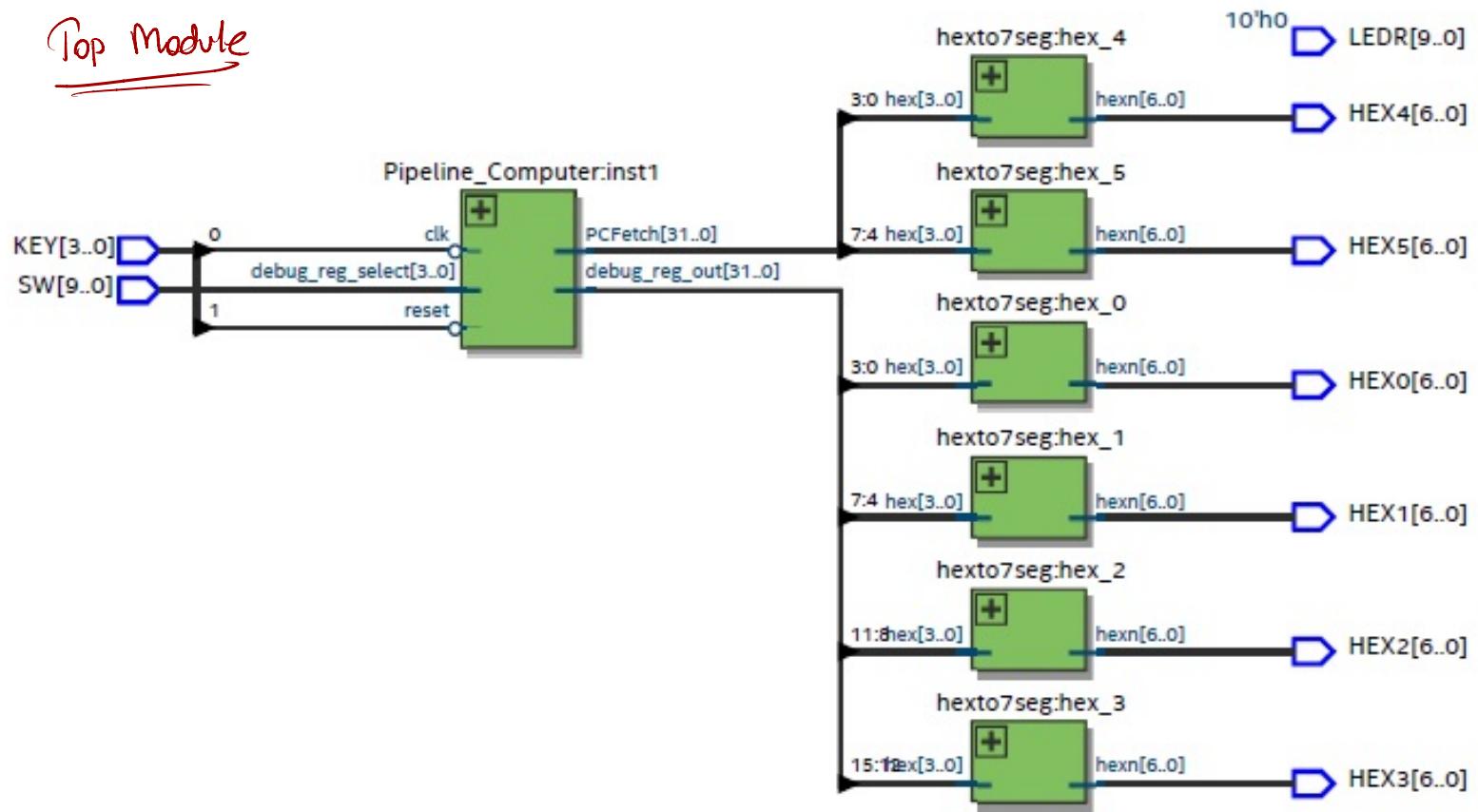
Other signals are 0.

Op : 01 Memory

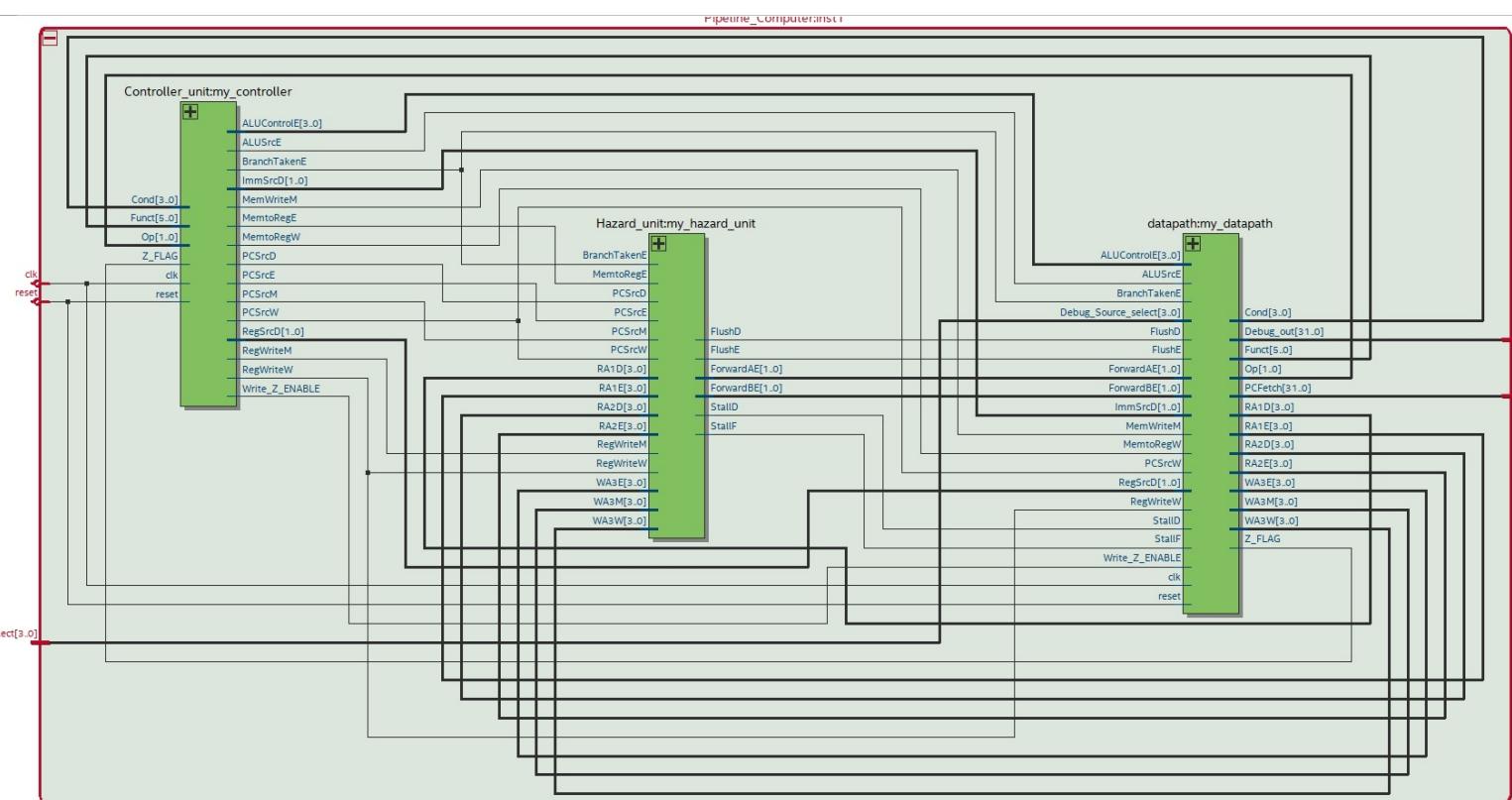
Function [0]

	LDR	STR
MemToRegD	1	0
MemWrite D	0	1
ALU control	0100	0100
ALUSRC	1	1
ImmSrc	1	1
RegWrite	1	1
RegSrcD	0	10

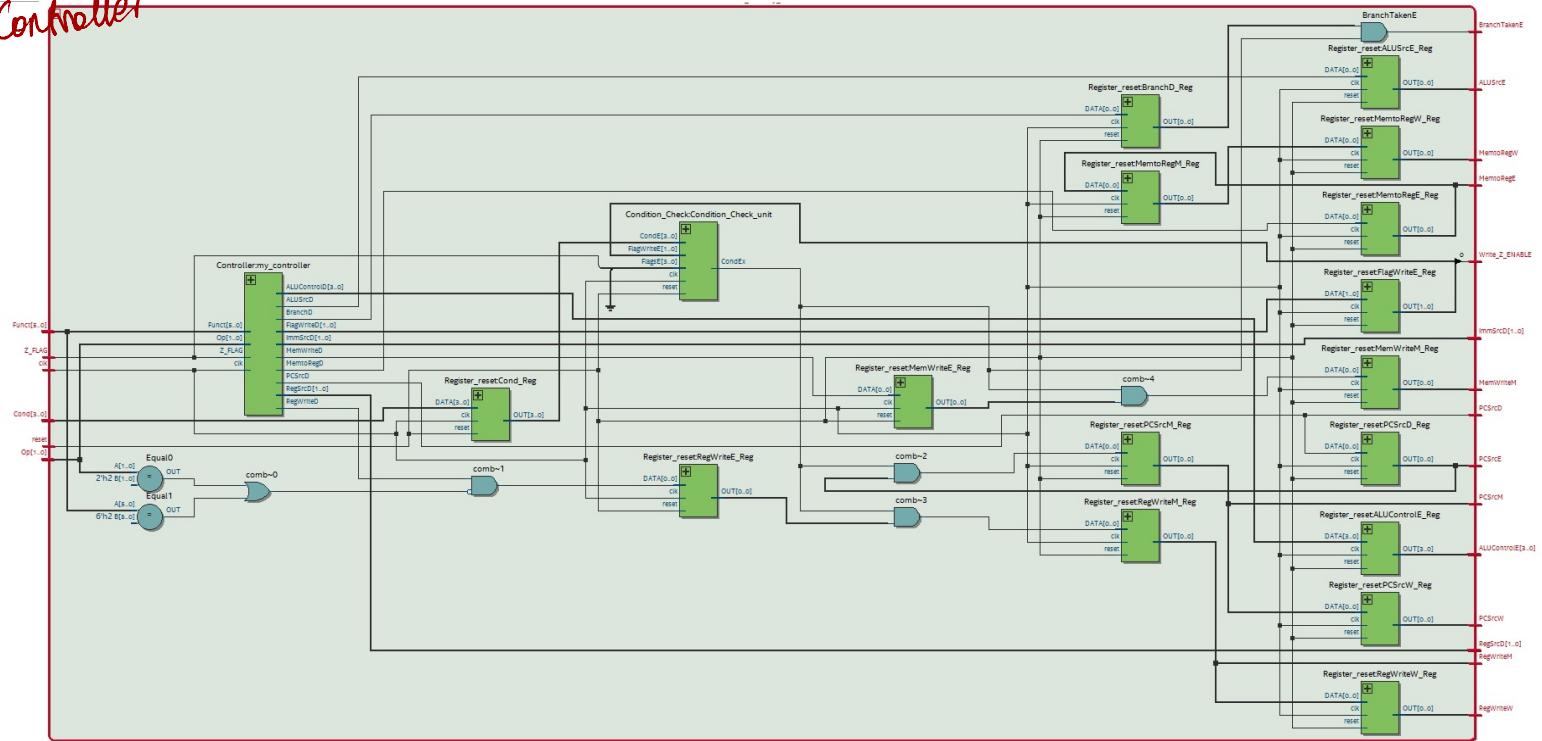
Top Module



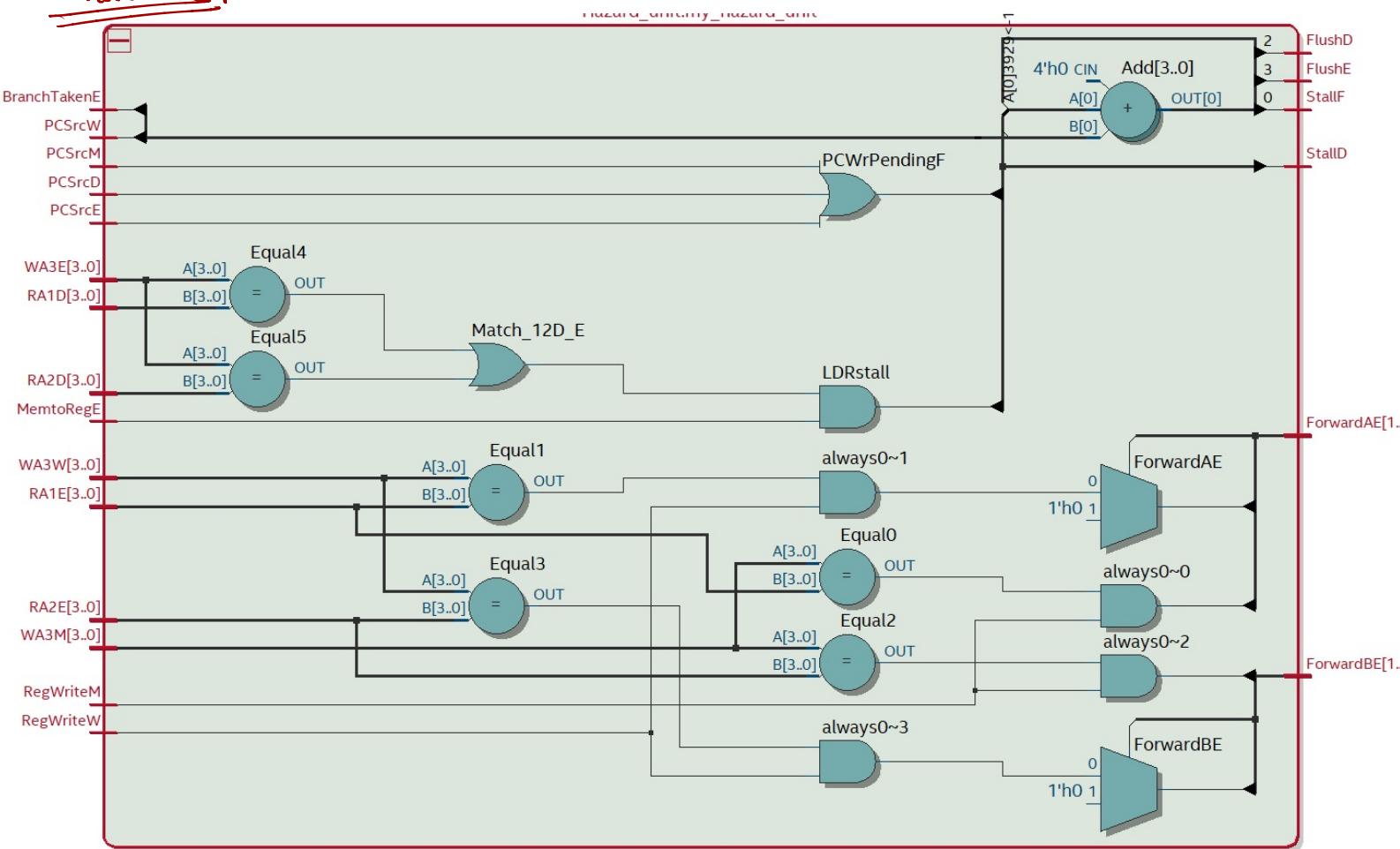
Pipeline Computer



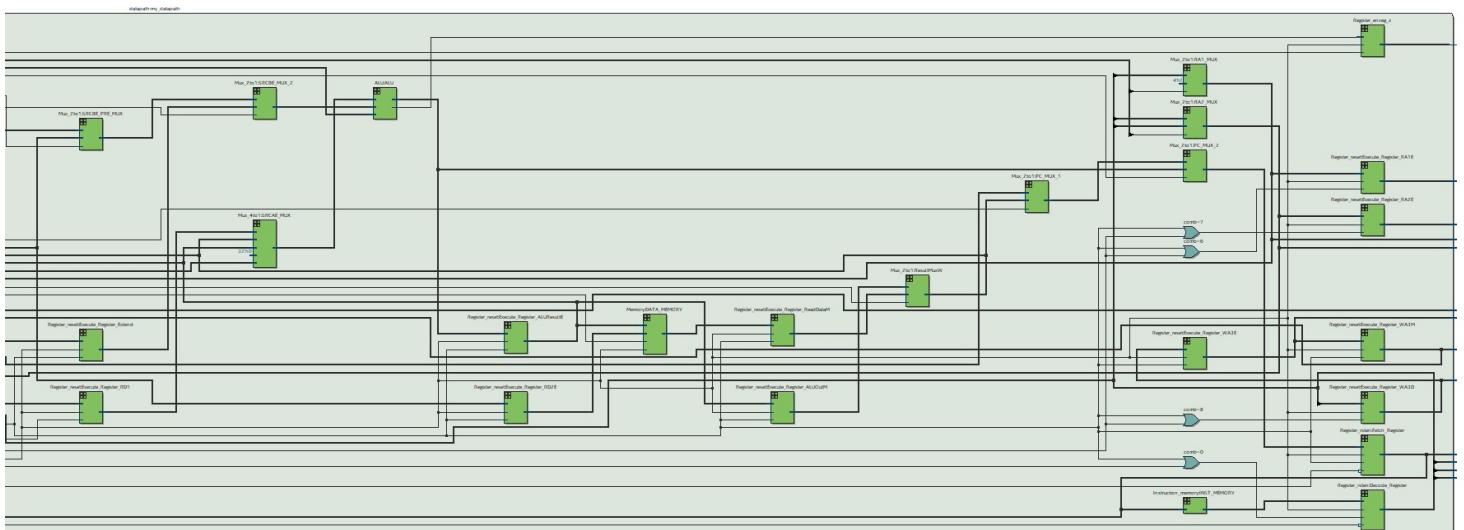
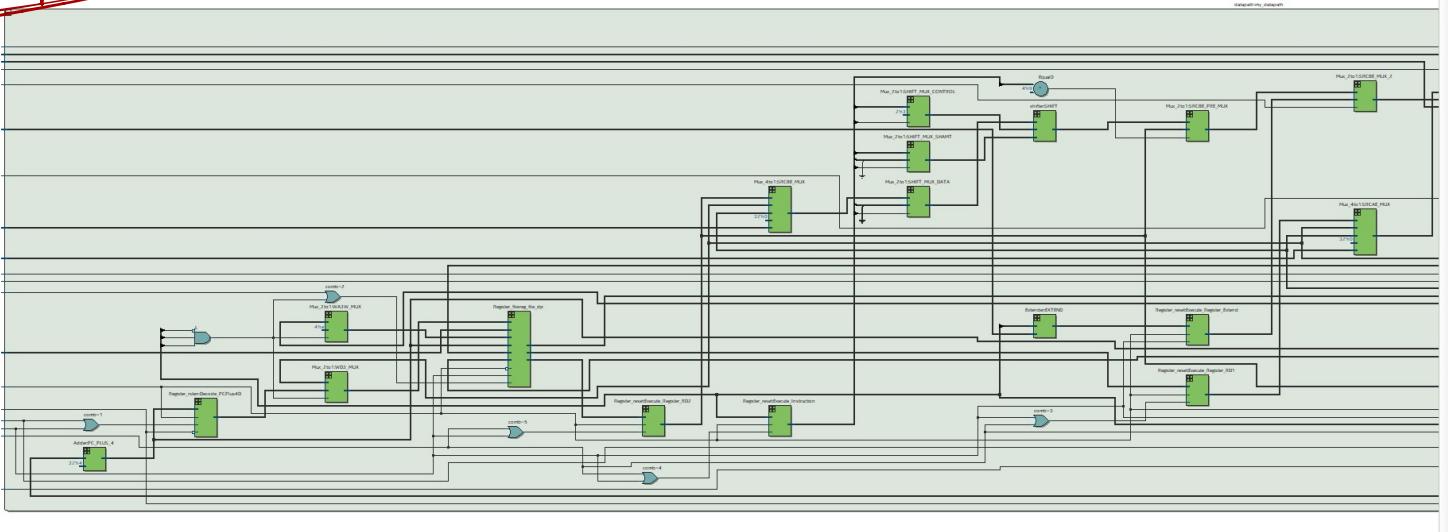
Controller



Hazard Unit



Data Path



I deactivated PC and R14 tests because in the last stages R15 show -1 and In the BL instruction R14 is written earlier than test results. I designed like that way.

```
10000.00ns DEBUG Performance Model ***** Clock cycle: 0 *****
10000.00ns DEBUG Performance Model ***** Current Instruction *****
10000.00ns DEBUG Performance Model Binary string:11100011101000000001000000010011
10000.00ns DEBUG Performance Model Operation type Data Processing
10000.00ns DEBUG Performance Model cond:E
10000.00ns DEBUG Performance Model Immediate bit:1
10000.00ns DEBUG Performance Model cmd:D
10000.00ns DEBUG Performance Model Set bit:0
10000.00ns DEBUG Performance Model Rn:0 Rd:1
10000.00ns DEBUG Performance Model rot:0 imm8:19
15000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000000
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 000000
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x0000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe3a01013
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x00000000
```

```
my_datapath.PCPlus4D      = 0x00000000
my_datapath.PCPlus4F      = 0x00000004
my_datapath.PCPlus8D      = 0x00000004
my_datapath.PCSrcW        = 0
my_datapath.PC_NEXT       = 0x00000004
my_datapath.PC_NEXT_NEXT  = 0x00000004
my_datapath.RA1D          = 0000
my_datapath.RA1E          = 0000
my_datapath.RA2D          = 0000
my_datapath.RA2E          = 0000
my_datapath.RD1           = 0x00000000
my_datapath.RD1E          = 0x00000000
my_datapath.RD2           = 0x00000000
my_datapath.RD2E          = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE     = 00000000
my_datapath.Rd            = 0000
my_datapath.ReadDataM     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW     = 0x00000000
my_datapath.RegSrcD       = 00
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x00000000
my_datapath.Rm            = 0000
my_datapath.Rn            = 0000
my_datapath.SHIFTED_DATA  = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA    = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE         = 0x00000000
my_datapath.SrcB          = 0x00000000
my_datapath.SrcBE         = 0x00000000
my_datapath.SrcBEData     = 0x00000000
my_datapath.StallID       = 0
my_datapath.StallF        = 0
my_datapath.WA3E          = 0000
my_datapath.WA3M          = 0000
my_datapath.WA3W          = 0000
my_datapath.WriteDataM    = 0x00000000
my_datapath.Write_Z_ENABLE = 0
```

```
my_datapath.Z_FLAG      = 0
my_datapath.Z_OUT       = 1
my_datapath.clk         = 1
my_datapath.reset        = 0
15000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD = 0000
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD    = 0
my_controller.BranchE    = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 0000
my_controller.CondE      = 0000
my_controller.CondEx     = 0
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct      = 000000
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 0
my_controller.RegWriteM   = 0
my_controller.RegWriteW   = 0
my_controller.Write_Z_ENABLE = 0
```

```

my_controller.Z_FLAG      = 0
my_controller.clk        = 1
my_controller.reset      = 0

16000.00ns DEBUG Performance Model **** Performance Model / DUT Data *****
16000.00ns DEBUG Performance Model PC:0x4 PC:0x4
16000.00ns DEBUG Performance Model Register:0: 0x0 0x0
16000.00ns DEBUG Performance Model Register:1: 0x0 0x0
16000.00ns DEBUG Performance Model Register:2: 0x0 0x0
16000.00ns DEBUG Performance Model Register:3: 0x0 0x0
16000.00ns DEBUG Performance Model Register:4: 0x0 0x0
16000.00ns DEBUG Performance Model Register:5: 0x0 0x0
16000.00ns DEBUG Performance Model Register:6: 0x0 0x0
16000.00ns DEBUG Performance Model Register:7: 0x0 0x0
16000.00ns DEBUG Performance Model Register:8: 0x0 0x0
16000.00ns DEBUG Performance Model Register:9: 0x0 0x0
16000.00ns DEBUG Performance Model Register:10: 0x0 0x0
16000.00ns DEBUG Performance Model Register:11: 0x0 0x0
16000.00ns DEBUG Performance Model Register:12: 0x0 0x0
16000.00ns DEBUG Performance Model Register:13: 0x0 0x0
16000.00ns DEBUG Performance Model Register:14: 0x0 0x0
16000.00ns DEBUG Performance Model Register:15: Not checked 0x8
***** Clock cycle: 1 *****
***** Current Instruction *****
Binary string:111000010000010010000000000001
Operation type Data Processing
cond:E
Immediate bit:0
cmd:4
Set bit:0
Rn:1 Rd:2
shamt5:0 sh:0 Rm:1
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0000
my_datapath.ALUOutM    = 0x00000000
my_datapath.ALUOutW    = 0x00000000
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE    = 0
my_datapath.BX         = 0
my_datapath.BranchTakenE = 0

```

```
my_datapath.Cond      = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0000
my_datapath.ExtImmD    = 0x00000013
my_datapath.ExtImmE    = 0x00000000
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE   = 00
my_datapath.ForwardBE   = 00
my_datapath.Funct      = 111010
my_datapath.ImmSrcD    = 00
my_datapath.Inst       = 0xa01013
my_datapath.InstructionD = 0xe3a01013
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe0812001
my_datapath.L          = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op         = 00
my_datapath.PCFetch     = 0x00000004
my_datapath.PCPlus4D    = 0x00000004
my_datapath.PCPlus4F    = 0x00000008
my_datapath.PCPlus8D    = 0x00000008
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x00000008
my_datapath.PC_NEXT_NEXT = 0x00000008
my_datapath.RA1D       = 0000
my_datapath.RA1E       = 0000
my_datapath.RA2D       = 0011
my_datapath.RA2E       = 0000
my_datapath.RD1        = 0x00000000
my_datapath.RD1E       = 0x00000000
my_datapath.RD2        = 0x00000000
my_datapath.RD2E       = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd         = 0001
my_datapath.ReadDataM   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

```

my_datapath.ReadDataW      =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD       = 00
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x00000000
my_datapath.Rm            = 0011
my_datapath.Rn            = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA    = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE         = 0x00000000
my_datapath.SrcB          = 0x00000000
my_datapath.SrcBE         = 0x00000000
my_datapath.SrcBEData    = 0x00000000
my_datapath.StallID       = 0
my_datapath.StallIF       = 0
my_datapath.WA3E          = 0000
my_datapath.WA3M          = 0000
my_datapath.WA3W          = 0000
my_datapath.WriteDataM    = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG        = 0
my_datapath.Z_OUT          = 1
my_datapath.clk           = 1
my_datapath.reset          = 0
25000.00ns DEBUG Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD    = 0
my_controller.BranchE    = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 0000
my_controller.CondEx     = 0
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01

```

```

my_controller.FuncControl = 0
my_controller.Funct      = 111010
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op         = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD = 1
my_controller.RegWriteE = 1
my_controller.RegWriteM = 0
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG     = 0
my_controller.clk        = 1
my_controller.reset      = 0

26000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
26000.00ns DEBUG Performance Model PC:0x8 PC:0x8
26000.00ns DEBUG Performance Model Register:0: 0x0 0x0
26000.00ns DEBUG Performance Model Register:1: 0x0 0x0
26000.00ns DEBUG Performance Model Register:2: 0x0 0x0
26000.00ns DEBUG Performance Model Register:3: 0x0 0x0
26000.00ns DEBUG Performance Model Register:4: 0x0 0x0
26000.00ns DEBUG Performance Model Register:5: 0x0 0x0
26000.00ns DEBUG Performance Model Register:6: 0x0 0x0
26000.00ns DEBUG Performance Model Register:7: 0x0 0x0
26000.00ns DEBUG Performance Model Register:8: 0x0 0x0
26000.00ns DEBUG Performance Model Register:9: 0x0 0x0
26000.00ns DEBUG Performance Model Register:10: 0x0 0x0
26000.00ns DEBUG Performance Model Register:11: 0x0 0x0
26000.00ns DEBUG Performance Model Register:12: 0x0 0x0

```

```

26000.00ns DEBUG Performance Model      Register:13: 0x0      0x0
26000.00ns DEBUG Performance Model      Register:14: 0x0      0x0
26000.00ns DEBUG Performance Model      Register:15: Not checked 0xc
26000.00ns DEBUG Performance Model      **** Clock cycle: 2 ****
26000.00ns DEBUG Performance Model      ***** Current Instruction *****
26000.00ns DEBUG Performance Model      Binary string:1110000000000010011000000000010
26000.00ns DEBUG Performance Model      Operation type Data Processing
26000.00ns DEBUG Performance Model      cond:E
26000.00ns DEBUG Performance Model      Immediate bit:0
26000.00ns DEBUG Performance Model      cmd:0
26000.00ns DEBUG Performance Model      Set bit:0
26000.00ns DEBUG Performance Model      Rn:1   Rd:3
26000.00ns DEBUG Performance Model      shamt5:0   sh:0   Rm:2
35000.00ns DEBUG Performance Model      ***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 1101
my_datapath.ALUOutM    = 0x00000000
my_datapath.ALUOutW    = 0x00000000
my_datapath.ALUResultE = 0x00000013
my_datapath.ALUSrcE    = 0
my_datapath.BX         = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond       = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0000
my_datapath.ExtImmD    = 0x00000001
my_datapath.ExtImmE    = 0x00000013
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE   = 00
my_datapath.ForwardBE   = 00
my_datapath.Funct       = 001000
my_datapath.ImmSrcD    = 00
my_datapath.Inst        = 0x812001
my_datapath.InstructionD = 0xe0812001
my_datapath.InstructionE = 0xe3a01013
my_datapath.InstructionF = 0xe0013002
my_datapath.L            = 0
my_datapath.MemWriteM   = 0

```

```
my_datapath.MemtoRegW    = 0
my_datapath.Op          = 00
my_datapath.PCFetch     = 0x00000008
my_datapath.PCPlus4D    = 0x00000008
my_datapath.PCPlus4F    = 0x0000000c
my_datapath.PCPlus8D    = 0x0000000c
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x0000000c
my_datapath.PC_NEXT_NEXT = 0x0000000c
my_datapath.RA1D        = 0001
my_datapath.RA1E        = 0000
my_datapath.RA2D        = 0001
my_datapath.RA2E        = 0011
my_datapath.RD1         = 0x00000000
my_datapath.RD1E        = 0x00000000
my_datapath.RD2         = 0x00000000
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd          = 0010
my_datapath.ReadDataM   = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000000
my_datapath.Rm          = 0001
my_datapath.Rn          = 0001
my_datapath.SHIFTED_DATA = 0x00000013
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA   = 0x00000013
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE       = 0x00000000
my_datapath.SrcB        = 0x00000000
my_datapath.SrcBE       = 0x00000013
my_datapath.SrcBEData   = 0x00000013
my_datapath.StallID     = 0
my_datapath.StallF      = 0
my_datapath.WA3E        = 0001
my_datapath.WA3M        = 0000
```

```
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 0
my_datapath.clk        = 1
my_datapath.reset      = 0
35000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 1101
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 0
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE    = 1110
my_controller.CondEx   = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 001000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op         = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD = 1
my_controller.RegWriteE = 1
```

```

my_controller.RegWriteM = 0
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0
36000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
36000.00ns DEBUG Performance Model PC:0xc PC:0xc
36000.00ns DEBUG Performance Model Register:0: 0x0 0x0
36000.00ns DEBUG Performance Model Register:1: 0x0 0x0
36000.00ns DEBUG Performance Model Register:2: 0x0 0x0
36000.00ns DEBUG Performance Model Register:3: 0x0 0x0
36000.00ns DEBUG Performance Model Register:4: 0x0 0x0
36000.00ns DEBUG Performance Model Register:5: 0x0 0x0
36000.00ns DEBUG Performance Model Register:6: 0x0 0x0
36000.00ns DEBUG Performance Model Register:7: 0x0 0x0
36000.00ns DEBUG Performance Model Register:8: 0x0 0x0
36000.00ns DEBUG Performance Model Register:9: 0x0 0x0
36000.00ns DEBUG Performance Model Register:10: 0x0 0x0
36000.00ns DEBUG Performance Model Register:11: 0x0 0x0
36000.00ns DEBUG Performance Model Register:12: 0x0 0x0
36000.00ns DEBUG Performance Model Register:13: 0x0 0x0
36000.00ns DEBUG Performance Model Register:14: 0x0 0x0
36000.00ns DEBUG Performance Model Register:15: Not checked 0x10
***** Clock cycle: 3 *****
Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0100
my_datapath.ALUOutM = 0x00000013
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x00000026
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000002

```

```
my_datapath.ExtImmE      = 0x00000001
my_datapath.FlushD      = 0
my_datapath.FlushE      = 0
my_datapath.ForwardAE   = 10
my_datapath.ForwardBE   = 10
my_datapath.Funct       = 000000
my_datapath.ImmSrcD    = 00
my_datapath.Inst        = 0x013002
my_datapath.InstructionD = 0xe0013002
my_datapath.InstructionE = 0xe0812001
my_datapath.InstructionF = 0xea000000
my_datapath.L           = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op          = 00
my_datapath.PCFetch     = 0x0000000c
my_datapath.PCPlus4D    = 0x0000000c
my_datapath.PCPlus4F    = 0x00000010
my_datapath.PCPlus8D    = 0x00000010
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x00000010
my_datapath.PC_NEXT_NEXT = 0x00000010
my_datapath.RA1D        = 0001
my_datapath.RA1E        = 0001
my_datapath.RA2D        = 0010
my_datapath.RA2E        = 0001
my_datapath.RD1          = 0x00000000
my_datapath.RD1E        = 0x00000000
my_datapath.RD2          = 0x00000000
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd          = 0011
my_datapath.ReadDataM   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000000
my_datapath.Rm          = 0010
```

```

my_datapath.Rn      = 0001
my_datapath.SHIFTED_DATA = 0x00000013
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000013
my_datapath.SHIFT_SHAMT  = 00000
my_datapath.SrcAE     = 0x00000013
my_datapath.SrcB      = 0x00000013
my_datapath.SrcBE     = 0x00000013
my_datapath.SrcBEData = 0x00000013
my_datapath.StallID   = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 0010
my_datapath.WA3M      = 0001
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG    = 1
my_datapath.Z_OUT     = 0
my_datapath.clk       = 1
my_datapath.reset     = 0
45000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0000
my_controller.ALUControlE = 0100
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 0
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE    = 1110
my_controller.CondEx   = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct     = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD = 0
my_controller.MemWriteE = 0

```

```

my_controller.MemWriteM = 0
my_controller.MemtoRegD = 0
my_controller.MemtoRegE = 0
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op = 00
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 00
my_controller.RegWriteD = 1
my_controller.RegWriteE = 1
my_controller.RegWriteM = 1
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0

46000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
46000.00ns DEBUG Performance Model PC:0x10 PC:0x10
46000.00ns DEBUG Performance Model Register:0: 0x0 0x0
46000.00ns DEBUG Performance Model Register:1: 0x0 0x0
46000.00ns DEBUG Performance Model Register:2: 0x0 0x0
46000.00ns DEBUG Performance Model Register:3: 0x0 0x0
46000.00ns DEBUG Performance Model Register:4: 0x0 0x0
46000.00ns DEBUG Performance Model Register:5: 0x0 0x0
46000.00ns DEBUG Performance Model Register:6: 0x0 0x0
46000.00ns DEBUG Performance Model Register:7: 0x0 0x0
46000.00ns DEBUG Performance Model Register:8: 0x0 0x0
46000.00ns DEBUG Performance Model Register:9: 0x0 0x0
46000.00ns DEBUG Performance Model Register:10: 0x0 0x0
46000.00ns DEBUG Performance Model Register:11: 0x0 0x0
46000.00ns DEBUG Performance Model Register:12: 0x0 0x0
46000.00ns DEBUG Performance Model Register:13: 0x0 0x0
46000.00ns DEBUG Performance Model Register:14: 0x0 0x0
46000.00ns DEBUG Performance Model Register:15: Not checked 0x14
***** Clock cycle: 4 *****
46000.00ns DEBUG Performance Model Computer is stalled for this cycle

```

55000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****

```
my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000026
my_datapath.ALUOutW = 0x00000013
my_datapath.ALUResultE = 0x00000002
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0001
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000002
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 01
my_datapath.ForwardBE = 10
my_datapath.Funct = 100000
my_datapath.ImmSrcD = 10
my_datapath.Inst = 0x000000
my_datapath.InstructionD = 0xea000000
my_datapath.InstructionE = 0xe0013002
my_datapath.InstructionF = 0x00000000
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 10
my_datapath.PCFetch = 0x00000010
my_datapath.PCPlus4D = 0x00000010
my_datapath.PCPlus4F = 0x00000014
my_datapath.PCPlus8D = 0x00000014
my_datapath.PCSrcW = 0
my_datapath.PC_NEXT = 0x00000014
my_datapath.PC_NEXT_NEXT = 0x00000014
my_datapath.RA1D = 1111
my_datapath.RA1E = 0001
my_datapath.RA2D = 0000
my_datapath.RA2E = 0010
```

```

my_datapath.RD1      = 0x00000014
my_datapath.RD1E     = 0x00000000
my_datapath.RD2      = 0x00000000
my_datapath.RD2E     = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000013
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd       = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 01
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000013
my_datapath.Rm       = 0000
my_datapath.Rn       = 0000
my_datapath.SHIFTED_DATA = 0x00000026
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000026
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x00000013
my_datapath.SrcB      = 0x00000026
my_datapath.SrcBE     = 0x00000026
my_datapath.SrcBEData  = 0x00000026
my_datapath.StallID    = 0
my_datapath.StallF     = 0
my_datapath.WA3E      = 0011
my_datapath.WA3M      = 0010
my_datapath.WA3W      = 0001
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 0
my_datapath.Z_OUT      = 0
my_datapath.clk       = 1
my_datapath.reset     = 0
55000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 1
my_controller.ALUSrcE    = 0
my_controller.BControl   = 1

```

```

my_controller.BranchD      = 1
my_controller.BranchE      = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 1110
my_controller.CondEx      = 1
my_controller.FlagWriteD  = 00
my_controller.FlagWriteE  = 01
my_controller.FuncControl = 0
my_controller.Funct       = 100000
my_controller.ImmSrcD    = 10
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 10
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 01
my_controller.RegWriteD   = 0
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 1
my_controller.RegWriteW   = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG      = 0
my_controller.clk         = 1
my_controller.reset        = 0
56000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
56000.00ns DEBUG Performance Model PC:0x14      PC:0x14
56000.00ns DEBUG Performance Model Register:0: 0x0      0x0
56000.00ns DEBUG Performance Model Register:1: 0x13     0x13
56000.00ns DEBUG Performance Model Register:2: 0x0      0x0
56000.00ns DEBUG Performance Model Register:3: 0x0      0x0
56000.00ns DEBUG Performance Model Register:4: 0x0      0x0

```

```

56000.00ns DEBUG Performance Model      Register:5: 0x0      0x0
56000.00ns DEBUG Performance Model      Register:6: 0x0      0x0
56000.00ns DEBUG Performance Model      Register:7: 0x0      0x0
56000.00ns DEBUG Performance Model      Register:8: 0x0      0x0
56000.00ns DEBUG Performance Model      Register:9: 0x0      0x0
56000.00ns DEBUG Performance Model      Register:10: 0x0     0x0
56000.00ns DEBUG Performance Model      Register:11: 0x0     0x0
56000.00ns DEBUG Performance Model      Register:12: 0x0     0x0
56000.00ns DEBUG Performance Model      Register:13: 0x0     0x0
56000.00ns DEBUG Performance Model      Register:14: 0x0     0x0
56000.00ns DEBUG Performance Model      Register:15: Not checked 0x18
***** Clock cycle: 5 *****
***** Current Instruction *****
Binary string:11101010000000000000000000000000
Operation type Branch (except Bx)
Link bit:0
imm24:0
***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 0100
my_datapath.ALUOutM = 0x00000002
my_datapath.ALUOutW = 0x00000026
my_datapath.ALUResultE = 0x00000014
my_datapath.ALUSrcE = 1
my_datapath.BX = 0
my_datapath.BranchTakenE = 1
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0010
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 1
my_datapath.FlushE = 1
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 000000
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x00000000
my_datapath.InstructionD = 0x00000000

```

```
my_datapath.InstructionE = 0xea000000
my_datapath.InstructionF = 0xe1a04101
my_datapath.L          = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op         = 00
my_datapath.PCFetch    = 0x00000014
my_datapath.PCPlus4D   = 0x00000014
my_datapath.PCPlus4F   = 0x00000018
my_datapath.PCPlus8D   = 0x00000018
my_datapath.PCSrcW    = 0
my_datapath.PC_NEXT    = 0x00000018
my_datapath.PC_NEXT_NEXT = 0x00000014
my_datapath.RA1D      = 0000
my_datapath.RA1E      = 1111
my_datapath.RA2D      = 0000
my_datapath.RA2E      = 0000
my_datapath.RD1       = 0x00000000
my_datapath.RD1E     = 0x00000014
my_datapath.RD2       = 0x00000000
my_datapath.RD2E     = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000026
my_datapath.ROT_VALUE = 00000000
my_datapath.Rd        = 0000
my_datapath.ReadDataM = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD   = 00
my_datapath.RegWriteW = 1
my_datapath.ResultW   = 0x00000026
my_datapath.Rm        = 0000
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA = 0x00000000
my_datapath.SHIFT_SHAMT = 00000
my_datapath.SrcAE     = 0x00000014
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData = 0x00000000
```

```

my_datapath.StallD      = 0
my_datapath.StallF      = 0
my_datapath.WA3E        = 0000
my_datapath.WA3M        = 0011
my_datapath.WA3W        = 0010
my_datapath.WriteDataM  = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG      = 0
my_datapath.Z_OUT       = 0
my_datapath.clk         = 1
my_datapath.reset        = 0
65000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControID = 0000
my_controller.ALUControlE = 0100
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 1
my_controller.BControl   = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 1
my_controller.BranchTakenE = 1
my_controller.Cond       = 0000
my_controller.CondE     = 1110
my_controller.CondEx    = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op         = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0

```

```

my_controller.PCSrcW      = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 0
my_controller.RegWriteM   = 1
my_controller.RegWriteW   = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG      = 0
my_controller.clk         = 1
my_controller.reset        = 0

66000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
66000.00ns DEBUG Performance Model PC:0x14      PC:0x14
66000.00ns DEBUG Performance Model Register:0: 0x0      0x0
66000.00ns DEBUG Performance Model Register:1: 0x13     0x13
66000.00ns DEBUG Performance Model Register:2: 0x26     0x26
66000.00ns DEBUG Performance Model Register:3: 0x0      0x0
66000.00ns DEBUG Performance Model Register:4: 0x0      0x0
66000.00ns DEBUG Performance Model Register:5: 0x0      0x0
66000.00ns DEBUG Performance Model Register:6: 0x0      0x0
66000.00ns DEBUG Performance Model Register:7: 0x0      0x0
66000.00ns DEBUG Performance Model Register:8: 0x0      0x0
66000.00ns DEBUG Performance Model Register:9: 0x0      0x0
66000.00ns DEBUG Performance Model Register:10: 0x0     0x0
66000.00ns DEBUG Performance Model Register:11: 0x0     0x0
66000.00ns DEBUG Performance Model Register:12: 0x0     0x0
66000.00ns DEBUG Performance Model Register:13: 0x0     0x0
66000.00ns DEBUG Performance Model Register:14: 0x0     0x0
66000.00ns DEBUG Performance Model Register:15: Not checked 0x18
***** Clock cycle: 6 *****
***** Current Instruction *****
Binary string:11100001101000000100000100000001
Operation type Data Processing
cond:E
Immediate bit:0
cmd:D
Set bit:0
Rn:0 Rd:4
shamt5:2 sh:0 Rm:1
***** DUT DATAPATH Signals *****

```

```
my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000014
my_datapath.ALUOutW = 0x00000002
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0011
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 000000
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe1a04101
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x00000014
my_datapath.PCPlus4D = 0x00000000
my_datapath.PCPlus4F = 0x00000018
my_datapath.PCPlus8D = 0x00000018
my_datapath.PCSrcW = 0
my_datapath.PC_NEXT = 0x00000018
my_datapath.PC_NEXT_NEXT = 0x00000018
my_datapath.RA1D = 0000
my_datapath.RA1E = 0000
my_datapath.RA2D = 0000
my_datapath.RA2E = 0000
my_datapath.RD1 = 0x00000000
```

```

my_datapath.RD1E      = 0x00000000
my_datapath.RD2      = 0x00000000
my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000002
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd        = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000002
my_datapath.Rm        = 0000
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x00000000
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData  = 0x00000000
my_datapath.StallID    = 0
my_datapath.StallIF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0011
my_datapath.WriteDataM  = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 0
my_datapath.Z_OUT      = 1
my_datapath.clk        = 1
my_datapath.reset      = 0
75000.00ns DEBUG Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD  = 0000
my_controller.ALUControlE  = 0000
my_controller.ALUSrcD     = 0
my_controller.ALUSrcE     = 0
my_controller.BControl    = 0
my_controller.BranchD    = 0

```

```

my_controller.BranchE      = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 0000
my_controller.CondE       = 0000
my_controller.CondEx     = 0
my_controller.FlagWriteD  = 01
my_controller.FlagWriteE  = 01
my_controller.FuncControl = 0
my_controller.Funct       = 000000
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 0
my_controller.RegWriteW   = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG      = 0
my_controller.clk         = 1
my_controller.reset        = 0

```

76000.00ns DEBUG Performance Model	***** Performance Model / DUT Data *****	
76000.00ns DEBUG Performance Model	PC:0x18	PC:0x18
76000.00ns DEBUG Performance Model	Register:0: 0x0	0x0
76000.00ns DEBUG Performance Model	Register:1: 0x13	0x13
76000.00ns DEBUG Performance Model	Register:2: 0x26	0x26
76000.00ns DEBUG Performance Model	Register:3: 0x2	0x2
76000.00ns DEBUG Performance Model	Register:4: 0x0	0x0
76000.00ns DEBUG Performance Model	Register:5: 0x0	0x0

```

76000.00ns DEBUG Performance Model      Register:6: 0x0      0x0
76000.00ns DEBUG Performance Model      Register:7: 0x0      0x0
76000.00ns DEBUG Performance Model      Register:8: 0x0      0x0
76000.00ns DEBUG Performance Model      Register:9: 0x0      0x0
76000.00ns DEBUG Performance Model      Register:10: 0x0     0x0
76000.00ns DEBUG Performance Model      Register:11: 0x0     0x0
76000.00ns DEBUG Performance Model      Register:12: 0x0     0x0
76000.00ns DEBUG Performance Model      Register:13: 0x0     0x0
76000.00ns DEBUG Performance Model      Register:14: 0x0     0x0
76000.00ns DEBUG Performance Model      Register:15: Not checked 0x1c
76000.00ns DEBUG Performance Model      **** Clock cycle: 7 ****
76000.00ns DEBUG Performance Model      ***** Current Instruction *****
76000.00ns DEBUG Performance Model      Binary string:11100000010000010101000100100010
76000.00ns DEBUG Performance Model      Operation type Data Processing
76000.00ns DEBUG Performance Model      cond:E
76000.00ns DEBUG Performance Model      Immediate bit:0
76000.00ns DEBUG Performance Model      cmd:2
76000.00ns DEBUG Performance Model      Set bit:0
76000.00ns DEBUG Performance Model      Rn:1   Rd:5
76000.00ns DEBUG Performance Model      shamt5:2   sh:1   Rm:2
85000.00ns DEBUG Performance Model      ***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0000
my_datapath.ALUOutM    = 0x00000000
my_datapath.ALUOutW    = 0x00000014
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE    = 0
my_datapath.BX         = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond       = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0000
my_datapath.ExtImmD    = 0x00000001
my_datapath.ExtImmE    = 0x00000000
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE  = 00
my_datapath.ForwardBE  = 00
my_datapath.Funct       = 011010

```

```
my_datapath.ImmSrcD      = 00
my_datapath.Inst          = 0xa04101
my_datapath.InstructionD = 0xe1a04101
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe0415122
my_datapath.L             = 0
my_datapath.MemWriteM     = 0
my_datapath.MemtoRegW     = 0
my_datapath.Op            = 00
my_datapath.PCFetch       = 0x00000018
my_datapath.PCPlus4D      = 0x00000018
my_datapath.PCPlus4F      = 0x00000001c
my_datapath.PCPlus8D      = 0x00000001c
my_datapath.PCSrcW        = 0
my_datapath.PC_NEXT        = 0x0000001c
my_datapath.PC_NEXT_NEXT   = 0x00000001c
my_datapath.RA1D           = 0000
my_datapath.RA1E           = 0000
my_datapath.RA2D           = 0001
my_datapath.RA2E           = 0000
my_datapath.RD1            = 0x00000000
my_datapath.RD1E           = 0x00000000
my_datapath.RD2            = 0x00000000
my_datapath.RD2E           = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000014
my_datapath.ROT_VALUE      = 00000000
my_datapath.Rd              = 0100
my_datapath.ReadDataM      = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW      = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD        = 00
my_datapath.RegWriteW       = 0
my_datapath.ResultW         = 0x00000000
my_datapath.Rm              = 0001
my_datapath.Rn              = 0000
my_datapath.SHIFTED_DATA   = 0x00000000
my_datapath.SHIFT_CONTROL  = 00
my_datapath.SHIFT_DATA      = 0x00000000
my_datapath.SHIFT_SHAMT    = 00000
my_datapath.SrcAE           = 0x00000000
```

```

my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData = 0x00000000
my_datapath.StallD    = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG    = 1
my_datapath.Z_OUT     = 1
my_datapath.clk       = 1
my_datapath.reset     = 0
85000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 0000
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 0
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE    = 0000
my_controller.CondEx   = 0
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct     = 011010
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op        = 00

```

```

my_controller.PCSrcD      = 0
my_controller.PCSrcE      = 0
my_controller.PCSrcM      = 0
my_controller.PCSrcW      = 0
my_controller.RegSrcD     = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 0
my_controller.RegWriteW   = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG      = 1
my_controller.clk         = 1
my_controller.reset        = 0

86000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
86000.00ns DEBUG Performance Model PC:0x1c    PC:0x1c
86000.00ns DEBUG Performance Model Register:0: 0x0    0x0
86000.00ns DEBUG Performance Model Register:1: 0x13   0x13
86000.00ns DEBUG Performance Model Register:2: 0x26   0x26
86000.00ns DEBUG Performance Model Register:3: 0x2    0x2
86000.00ns DEBUG Performance Model Register:4: 0x0    0x0
86000.00ns DEBUG Performance Model Register:5: 0x0    0x0
86000.00ns DEBUG Performance Model Register:6: 0x0    0x0
86000.00ns DEBUG Performance Model Register:7: 0x0    0x0
86000.00ns DEBUG Performance Model Register:8: 0x0    0x0
86000.00ns DEBUG Performance Model Register:9: 0x0    0x0
86000.00ns DEBUG Performance Model Register:10: 0x0   0x0
86000.00ns DEBUG Performance Model Register:11: 0x0   0x0
86000.00ns DEBUG Performance Model Register:12: 0x0   0x0
86000.00ns DEBUG Performance Model Register:13: 0x0   0x0
86000.00ns DEBUG Performance Model Register:14: 0x0   0x0
86000.00ns DEBUG Performance Model Register:15: Not checked 0x20
***** Clock cycle: 8 *****
***** Current Instruction *****
86000.00ns DEBUG Performance Model Binary string:11100001100000110110000101100011
86000.00ns DEBUG Performance Model Operation type Data Processing
86000.00ns DEBUG Performance Model cond:E
86000.00ns DEBUG Performance Model Immediate bit:0
86000.00ns DEBUG Performance Model cmd:C
86000.00ns DEBUG Performance Model Set bit:0

```

```
86000.00ns DEBUG Performance Model      Rn:3  Rd:6
86000.00ns DEBUG Performance Model      shamt5:2    sh:3  Rm:3
95000.00ns DEBUG Performance Model      **** DUT DATAPATH Signals ****
my_datapath.ALUControlE = 1101
my_datapath.ALUOutM = 0x00000000
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x0000004c
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000022
my_datapath.ExtImmE = 0x00000001
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 000100
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x415122
my_datapath.InstructionD = 0xe0415122
my_datapath.InstructionE = 0xe1a04101
my_datapath.InstructionF = 0xe1836163
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x0000001c
my_datapath.PCPlus4D = 0x0000001c
my_datapath.PCPlus4F = 0x00000020
my_datapath.PCPlus8D = 0x00000020
my_datapath.PCSrcW = 0
my_datapath.PC_NEXT = 0x00000020
my_datapath.PC_NEXT_NEXT = 0x00000020
my_datapath.RA1D = 0001
my_datapath.RA1E = 0000
```

```

my_datapath.RA2D      = 0010
my_datapath.RA2E      = 0001
my_datapath.RD1       = 0x00000013
my_datapath.RD1E      = 0x00000000
my_datapath.RD2       = 0x00000026
my_datapath.RD2E      = 0x00000013
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00100010
my_datapath.Rd        = 0101
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000000
my_datapath.Rm        = 0010
my_datapath.Rn        = 0001
my_datapath.SHIFTED_DATA = 0x0000004c
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000013
my_datapath.SHIFT_SHAMT   = 00010
my_datapath.SrcAE      = 0x00000000
my_datapath.SrcB       = 0x00000013
my_datapath.SrcBE      = 0x00000004c
my_datapath.SrcBEData  = 0x00000004c
my_datapath.StallID    = 0
my_datapath.StallF     = 0
my_datapath.WA3E       = 0100
my_datapath.WA3M       = 0000
my_datapath.WA3W       = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 0
my_datapath.clk        = 1
my_datapath.reset      = 0
95000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0010
my_controller.ALUControlE = 1101
my_controller.ALUSrcD   = 0

```

```

my_controller.ALUSrcE      = 0
my_controller.BControl     = 0
my_controller.BranchD     = 0
my_controller.BranchE     = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 1110
my_controller.CondEx      = 1
my_controller.FlagWriteD  = 01
my_controller.FlagWriteE  = 00
my_controller.FuncControl = 0
my_controller.Funct       = 000100
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD      = 0
my_controller.PCSrcE      = 0
my_controller.PCSrcM      = 0
my_controller.PCSrcW      = 0
my_controller.RegSrcD     = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 0
my_controller.RegWriteW   = 0
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG      = 1
my_controller.clk         = 1
my_controller.reset        = 0

```

***** Performance Model / DUT Data *****

96000.00ns DEBUG Performance Model	PC:0x20	PC:0x20
96000.00ns DEBUG Performance Model	Register:0:	0x0
96000.00ns DEBUG Performance Model	Register:1:	0x13
96000.00ns DEBUG Performance Model	Register:2:	0x26

```

96000.00ns DEBUG Performance Model Register:3: 0x2 0x2
96000.00ns DEBUG Performance Model Register:4: 0x0 0x0
96000.00ns DEBUG Performance Model Register:5: 0x0 0x0
96000.00ns DEBUG Performance Model Register:6: 0x0 0x0
96000.00ns DEBUG Performance Model Register:7: 0x0 0x0
96000.00ns DEBUG Performance Model Register:8: 0x0 0x0
96000.00ns DEBUG Performance Model Register:9: 0x0 0x0
96000.00ns DEBUG Performance Model Register:10: 0x0 0x0
96000.00ns DEBUG Performance Model Register:11: 0x0 0x0
96000.00ns DEBUG Performance Model Register:12: 0x0 0x0
96000.00ns DEBUG Performance Model Register:13: 0x0 0x0
96000.00ns DEBUG Performance Model Register:14: 0x0 0x0
96000.00ns DEBUG Performance Model Register:15: Not checked 0x24
***** Clock cycle: 9 *****
***** Current Instruction *****
Binary string:1110000110100000011111001000110
Operation type Data Processing
cond:E
Immediate bit:0
cmd:D
Set bit:0
Rn:0 Rd:7
shamt5:28 sh:2 Rm:6
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0010
my_datapath.ALUOutM = 0x0000004c
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x0000000a
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000063
my_datapath.ExtImmE = 0x00000022
my_datapath.FlushD = 0
my_datapath.FlushE = 0

```

```
my_datapath.ForwardAE    = 00
my_datapath.ForwardBE    = 00
my_datapath.Funct        = 011000
my_datapath.ImmSrcD     = 00
my_datapath.Inst         = 0x836163
my_datapath.InstructionD = 0xe1836163
my_datapath.InstructionE = 0xe0415122
my_datapath.InstructionF = 0xe1a07e46
my_datapath.L            = 0
my_datapath.MemWriteM    = 0
my_datapath.MemtoRegW    = 0
my_datapath.Op           = 00
my_datapath.PCFetch      = 0x00000020
my_datapath.PCPlus4D     = 0x00000020
my_datapath.PCPlus4F     = 0x00000024
my_datapath.PCPlus8D     = 0x00000024
my_datapath.PCSrcW       = 0
my_datapath.PC_NEXT       = 0x00000024
my_datapath.PC_NEXT_NEXT  = 0x00000024
my_datapath.RA1D          = 0011
my_datapath.RA1E          = 0001
my_datapath.RA2D          = 0011
my_datapath.RA2E          = 0010
my_datapath.RD1           = 0x00000002
my_datapath.RD1E          = 0x00000013
my_datapath.RD2           = 0x00000002
my_datapath.RD2E          = 0x00000026
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE     = 00100010
my_datapath.Rd             = 0110
my_datapath.ReadDataM     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD       = 00
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x00000000
my_datapath.Rm             = 0011
my_datapath.Rn             = 0011
my_datapath.SHIFTED_DATA  = 0x00000009
my_datapath.SHIFT_CONTROL = 01
```

```

my_datapath.SHIFT_DATA    = 0x00000026
my_datapath.SHIFT_SHAMT   = 00010
my_datapath.SrcAE        = 0x00000013
my_datapath.SrcB          = 0x00000026
my_datapath.SrcBE        = 0x00000009
my_datapath.SrcBEData   = 0x00000009
my_datapath.StallID      = 0
my_datapath.StallF       = 0
my_datapath.WA3E         = 0101
my_datapath.WA3M         = 0100
my_datapath.WA3W         = 0000
my_datapath.WriteDataM  = 0x00000013
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG       = 1
my_datapath.Z_OUT         = 0
my_datapath.clk          = 1
my_datapath.reset         = 0
105000.00ns DEBUG  Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1100
my_controller.ALUControlE = 0010
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 1110
my_controller.CondE     = 1110
my_controller.CondEx    = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct      = 011000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0

```

```

my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op = 00
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 00
my_controller.RegWriteD = 1
my_controller.RegWriteE = 1
my_controller.RegWriteM = 1
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0

106000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
106000.00ns DEBUG Performance Model PC:0x24 PC:0x24
106000.00ns DEBUG Performance Model Register:0: 0x0 0x0
106000.00ns DEBUG Performance Model Register:1: 0x13 0x13
106000.00ns DEBUG Performance Model Register:2: 0x26 0x26
106000.00ns DEBUG Performance Model Register:3: 0x2 0x2
106000.00ns DEBUG Performance Model Register:4: 0x0 0x0
106000.00ns DEBUG Performance Model Register:5: 0x0 0x0
106000.00ns DEBUG Performance Model Register:6: 0x0 0x0
106000.00ns DEBUG Performance Model Register:7: 0x0 0x0
106000.00ns DEBUG Performance Model Register:8: 0x0 0x0
106000.00ns DEBUG Performance Model Register:9: 0x0 0x0
106000.00ns DEBUG Performance Model Register:10: 0x0 0x0
106000.00ns DEBUG Performance Model Register:11: 0x0 0x0
106000.00ns DEBUG Performance Model Register:12: 0x0 0x0
106000.00ns DEBUG Performance Model Register:13: 0x0 0x0
106000.00ns DEBUG Performance Model Register:14: 0x0 0x0
106000.00ns DEBUG Performance Model Register:15: Not checked 0x28
***** Clock cycle: 10 *****
***** Current Instruction *****
Binary string:11100101100000010010000001010101
Operation type Memory
Load bit:0

```

```
106000.00ns DEBUG Performance Model      Rn:1  Rn:2
106000.00ns DEBUG Performance Model      imm12:85
115000.00ns DEBUG Performance Model      **** DUT DATAPATH Signals ****
my_datapath.ALUControlE    = 1100
my_datapath.ALUOutM        = 0x0000000a
my_datapath.ALUOutW        = 0x0000004c
my_datapath.ALUResultE     = 0x80000002
my_datapath.ALUSrcE       = 0
my_datapath.BX             = 0
my_datapath.BranchTakenE   = 0
my_datapath.Cond           = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out       = 0x00000000
my_datapath.DestSelect     = 0100
my_datapath.ExtImmD        = 0x00000046
my_datapath.ExtImmE        = 0x00000063
my_datapath.FlushD         = 0
my_datapath.FlushE         = 0
my_datapath.ForwardAE      = 00
my_datapath.ForwardBE      = 00
my_datapath.Funct          = 011010
my_datapath.ImmSrcD        = 00
my_datapath.Inst            = 0xa07e46
my_datapath.InstructionD   = 0xe1a07e46
my_datapath.InstructionE   = 0xe1836163
my_datapath.InstructionF   = 0xe5812055
my_datapath.L               = 0
my_datapath.MemWriteM       = 0
my_datapath.MemtoRegW       = 0
my_datapath.Op              = 00
my_datapath.PCFetch         = 0x00000024
my_datapath.PCPlus4D        = 0x00000024
my_datapath.PCPlus4F        = 0x00000028
my_datapath.PCPlus8D        = 0x00000028
my_datapath.PCSrcW          = 0
my_datapath.PC_NEXT          = 0x00000028
my_datapath.PC_NEXT_NEXT    = 0x00000028
my_datapath.RA1D            = 0000
my_datapath.RA1E            = 0011
```

```

my_datapath.RA2D      = 0110
my_datapath.RA2E      = 0011
my_datapath.RD1       = 0x00000000
my_datapath.RD1E      = 0x00000002
my_datapath.RD2       = 0x00000000
my_datapath.RD2E      = 0x00000002
my_datapath.REG_FILE_DATA = 0x0000004c
my_datapath.ROT_VALUE   = 00100010
my_datapath.Rd        = 0111
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x0000004c
my_datapath.Rm        = 0110
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x80000000
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA   = 0x00000002
my_datapath.SHIFT_SHAMT   = 00010
my_datapath.SrcAE      = 0x00000002
my_datapath.SrcB       = 0x00000002
my_datapath.SrcBE      = 0x80000000
my_datapath.SrcBEData   = 0x80000000
my_datapath.StallID     = 0
my_datapath.StallF     = 0
my_datapath.WA3E       = 0110
my_datapath.WA3M       = 0101
my_datapath.WA3W       = 0100
my_datapath.WriteDataM  = 0x00000026
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG      = 0
my_datapath.Z_OUT       = 0
my_datapath.clk         = 1
my_datapath.reset        = 0
115000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 1100
my_controller.ALUSrcD    = 0

```

```

my_controller.ALUSrcE      = 0
my_controller.BControl     = 0
my_controller.BranchD     = 0
my_controller.BranchE     = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 1110
my_controller.CondEx     = 1
my_controller.FlagWriteD  = 00
my_controller.FlagWriteE  = 01
my_controller.FuncControl = 0
my_controller.Funct       = 011010
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 1
my_controller.RegWriteW   = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG      = 0
my_controller.clk         = 1
my_controller.reset        = 0

```

***** Performance Model / DUT Data *****

116000.00ns DEBUG Performance Model	PC:0x28	PC:0x28
116000.00ns DEBUG Performance Model	Register:0:	0x0
116000.00ns DEBUG Performance Model	Register:1:	0x13
116000.00ns DEBUG Performance Model	Register:2:	0x26

```

116000.00ns DEBUG Performance Model Register:3: 0x2 0x2
116000.00ns DEBUG Performance Model Register:4: 0x4c 0x4c
116000.00ns DEBUG Performance Model Register:5: 0x0 0x0
116000.00ns DEBUG Performance Model Register:6: 0x0 0x0
116000.00ns DEBUG Performance Model Register:7: 0x0 0x0
116000.00ns DEBUG Performance Model Register:8: 0x0 0x0
116000.00ns DEBUG Performance Model Register:9: 0x0 0x0
116000.00ns DEBUG Performance Model Register:10: 0x0 0x0
116000.00ns DEBUG Performance Model Register:11: 0x0 0x0
116000.00ns DEBUG Performance Model Register:12: 0x0 0x0
116000.00ns DEBUG Performance Model Register:13: 0x0 0x0
116000.00ns DEBUG Performance Model Register:14: 0x0 0x0
116000.00ns DEBUG Performance Model Register:15: Not checked 0x2c
116000.00ns DEBUG Performance Model ***** Clock cycle: 11 *****
116000.00ns DEBUG Performance Model ***** Current Instruction *****
116000.00ns DEBUG Performance Model Binary string:11100101100100111000000001100110
116000.00ns DEBUG Performance Model Operation type Memory
116000.00ns DEBUG Performance Model Load bit:1
116000.00ns DEBUG Performance Model Rn:3 Rn:8
116000.00ns DEBUG Performance Model imm12:102
125000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 1101
my_datapath.ALUOutM = 0x80000002
my_datapath.ALUOutW = 0x0000000a
my_datapath.ALUResultE = 0xffffffff8
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0101
my_datapath.ExtImmD = 0x00000055
my_datapath.ExtImmE = 0x00000046
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 10
my_datapath.Funct = 011000

```

```
my_datapath.ImmSrcD      = 01
my_datapath.Inst        = 0x812055
my_datapath.InstructionD = 0xe5812055
my_datapath.InstructionE = 0xe1a07e46
my_datapath.InstructionF = 0xe5938066
my_datapath.L           = 0
my_datapath.MemWriteM    = 0
my_datapath.MemtoRegW    = 0
my_datapath.Op          = 01
my_datapath.PCFetch     = 0x00000028
my_datapath.PCPlus4D    = 0x00000028
my_datapath.PCPlus4F    = 0x0000002c
my_datapath.PCPlus8D    = 0x0000002c
my_datapath.PCSrcW      = 0
my_datapath.PC_NEXT      = 0x0000002c
my_datapath.PC_NEXT_NEXT = 0x0000002c
my_datapath.RA1D        = 0001
my_datapath.RA1E        = 0000
my_datapath.RA2D        = 0010
my_datapath.RA2E        = 0110
my_datapath.RD1         = 0x00000013
my_datapath.RD1E        = 0x00000000
my_datapath.RD2         = 0x00000026
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x0000000a
my_datapath.ROT_VALUE    = 11011100
my_datapath.Rd          = 0010
my_datapath.ReadDataM   = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD     = 10
my_datapath.RegWriteW   = 1
my_datapath.ResultW     = 0x0000000a
my_datapath.Rm          = 0101
my_datapath.Rn          = 0001
my_datapath.SHIFTED_DATA = 0xffffffff8
my_datapath.SHIFT_CONTROL = 10
my_datapath.SHIFT_DATA   = 0x80000002
my_datapath.SHIFT_SHAMT  = 11100
my_datapath.SrcAE       = 0x00000000
```

```
my_datapath.SrcB      = 0x80000002
my_datapath.SrcBE     = 0xffffffff8
my_datapath.SrcBEData = 0xffffffff8
my_datapath.StallD    = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 0111
my_datapath.WA3M      = 0110
my_datapath.WA3W      = 0101
my_datapath.WriteDataM = 0x00000002
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG    = 0
my_datapath.Z_OUT     = 0
my_datapath.clk       = 1
my_datapath.reset     = 0
125000.00ns DEBUG  Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 1101
my_controller.ALUSrcD   = 1
my_controller.ALUSrcE   = 0
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE     = 1110
my_controller.CondEx    = 1
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 011000
my_controller.ImmSrcD   = 01
my_controller.MemWriteD  = 1
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op        = 01
```

```

my_controller.PCSrcD      = 0
my_controller.PCSrcE      = 0
my_controller.PCSrcM      = 0
my_controller.PCSrcW      = 0
my_controller.RegSrcD     = 10
my_controller.RegWriteD    = 0
my_controller.RegWriteE    = 1
my_controller.RegWriteM    = 1
my_controller.RegWriteW    = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG       = 0
my_controller.clk          = 1
my_controller.reset         = 0

126000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
126000.00ns DEBUG Performance Model PC:0x2c      PC:0x2c
126000.00ns DEBUG Performance Model Register:0: 0x0      0x0
126000.00ns DEBUG Performance Model Register:1: 0x13     0x13
126000.00ns DEBUG Performance Model Register:2: 0x26     0x26
126000.00ns DEBUG Performance Model Register:3: 0x2      0x2
126000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
126000.00ns DEBUG Performance Model Register:5: 0xa      0xa
126000.00ns DEBUG Performance Model Register:6: 0x0      0x0
126000.00ns DEBUG Performance Model Register:7: 0x0      0x0
126000.00ns DEBUG Performance Model Register:8: 0x0      0x0
126000.00ns DEBUG Performance Model Register:9: 0x0      0x0
126000.00ns DEBUG Performance Model Register:10: 0x0     0x0
126000.00ns DEBUG Performance Model Register:11: 0x0     0x0
126000.00ns DEBUG Performance Model Register:12: 0x0     0x0
126000.00ns DEBUG Performance Model Register:13: 0x0     0x0
126000.00ns DEBUG Performance Model Register:14: 0x0     0x0
126000.00ns DEBUG Performance Model Register:15: Not checked 0x30
***** Clock cycle: 12 *****
126000.00ns DEBUG Performance Model Computer is stalled for this cycle
135000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****

my_datapath.ALUControlE   = 0100
my_datapath.ALUOutM       = 0xffffffff8
my_datapath.ALUOutW       = 0x80000002
my_datapath.ALUResultE    = 0x00000068
my_datapath.ALUSrcE       = 1

```

```
my_datapath.BX      = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond     = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0110
my_datapath.ExtImmD    = 0x00000066
my_datapath.ExtImmE    = 0x00000055
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE   = 00
my_datapath.ForwardBE   = 00
my_datapath.Funct      = 011001
my_datapath.ImmSrcD    = 01
my_datapath.Inst       = 0x938066
my_datapath.InstructionD = 0xe5938066
my_datapath.InstructionE = 0xe5812055
my_datapath.InstructionF = 0xe1520008
my_datapath.L          = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op         = 01
my_datapath.PCFetch    = 0x0000002c
my_datapath.PCPlus4D   = 0x0000002c
my_datapath.PCPlus4F   = 0x00000030
my_datapath.PCPlus8D   = 0x00000030
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x00000030
my_datapath.PC_NEXT_NEXT = 0x00000030
my_datapath.RA1D       = 0011
my_datapath.RA1E       = 0001
my_datapath.RA2D       = 0110
my_datapath.RA2E       = 0010
my_datapath.RD1        = 0x00000002
my_datapath.RD1E       = 0x00000013
my_datapath.RD2        = 0x00000000
my_datapath.RD2E       = 0x00000026
my_datapath.REG_FILE_DATA = 0x80000002
my_datapath.ROT_VALUE   = 00000000
```

```

my_datapath.Rd      = 1000
my_datapath.ReadDataM = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD = 00
my_datapath.RegWriteW = 1
my_datapath.ResultW = 0x80000002
my_datapath.Rm      = 0110
my_datapath.Rn      = 0011
my_datapath.SHIFTED_DATA = 0x00000026
my_datapath.SHIFT_CONTROL = 10
my_datapath.SHIFT_DATA = 0x00000026
my_datapath.SHIFT_SHAMT = 00000
my_datapath.SrcAE   = 0x00000013
my_datapath.SrcB    = 0x00000026
my_datapath.SrcBE   = 0x00000055
my_datapath.SrcBEData = 0x00000026
my_datapath.StallD  = 0
my_datapath.StallF  = 0
my_datapath.WA3E    = 0010
my_datapath.WA3M    = 0111
my_datapath.WA3W    = 0110
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG   = 0
my_datapath.Z_OUT    = 0
my_datapath.clk     = 1
my_datapath.reset   = 0
135000.00ns DEBUG  Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 0100
my_controller.ALUSrcD   = 1
my_controller.ALUSrcE   = 1
my_controller.BControl  = 0
my_controller.BranchD  = 0
my_controller.BranchE  = 0
my_controller.BranchTakenE = 0
my_controller.Cond     = 1110
my_controller.CondE   = 1110
my_controller.CondEx  = 1

```

```

my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct      = 011001
my_controller.ImmSrcD   = 01
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 1
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 1
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op         = 01
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD  = 1
my_controller.RegWriteE  = 0
my_controller.RegWriteM  = 1
my_controller.RegWriteW  = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG     = 0
my_controller.clk        = 1
my_controller.reset      = 0
136000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
136000.00ns DEBUG Performance Model PC:0x30      PC:0x30
136000.00ns DEBUG Performance Model Register:0: 0x0      0x0
136000.00ns DEBUG Performance Model Register:1: 0x13     0x13
136000.00ns DEBUG Performance Model Register:2: 0x26     0x26
136000.00ns DEBUG Performance Model Register:3: 0x2      0x2
136000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
136000.00ns DEBUG Performance Model Register:5: 0xa      0xa
136000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
136000.00ns DEBUG Performance Model Register:7: 0x0      0x0
136000.00ns DEBUG Performance Model Register:8: 0x0      0x0
136000.00ns DEBUG Performance Model Register:9: 0x0      0x0
136000.00ns DEBUG Performance Model Register:10: 0x0     0x0

```

```

136000.00ns DEBUG Performance Model Register:11: 0x0 0x0
136000.00ns DEBUG Performance Model Register:12: 0x0 0x0
136000.00ns DEBUG Performance Model Register:13: 0x0 0x0
136000.00ns DEBUG Performance Model Register:14: 0x0 0x0
136000.00ns DEBUG Performance Model Register:15: Not checked 0x34
136000.00ns DEBUG Performance Model **** Clock cycle: 13 ****
136000.00ns DEBUG Performance Model ***** Current Instruction *****
136000.00ns DEBUG Performance Model Binary string:1110000101010010000000000000001000
136000.00ns DEBUG Performance Model Operation type Data Processing
136000.00ns DEBUG Performance Model cond:E
136000.00ns DEBUG Performance Model Immediate bit:0
136000.00ns DEBUG Performance Model cmd:A
136000.00ns DEBUG Performance Model Set bit:1
136000.00ns DEBUG Performance Model Rn:2 Rd:0
136000.00ns DEBUG Performance Model shamt5:0 sh:0 Rm:8
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0100
my_datapath.ALUOutM = 0x00000068
my_datapath.ALUOutW = 0xffffffff8
my_datapath.ALUResultE = 0x00000068
my_datapath.ALUSrcE = 1
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0111
my_datapath.ExtImmD = 0x00000008
my_datapath.ExtImmE = 0x00000066
my_datapath.FlushD = 0
my_datapath.FlushE = 1
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 010101
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x520008
my_datapath.InstructionD = 0xe1520008
my_datapath.InstructionE = 0xe5938066
my_datapath.InstructionF = 0x1a000012

```

```
my_datapath.L      = 0
my_datapath.MemWriteM = 1
my_datapath.MemtoRegW = 0
my_datapath.Op      = 00
my_datapath.PCFetch   = 0x00000030
my_datapath.PCPlus4D   = 0x00000030
my_datapath.PCPlus4F   = 0x00000034
my_datapath.PCPlus8D   = 0x00000034
my_datapath.PCSrcW    = 0
my_datapath.PC_NEXT    = 0x00000034
my_datapath.PC_NEXT_NEXT = 0x00000034
my_datapath.RA1D     = 0010
my_datapath.RA1E     = 0011
my_datapath.RA2D     = 1000
my_datapath.RA2E     = 0110
my_datapath.RD1      = 0x00000026
my_datapath.RD1E     = 0x00000002
my_datapath.RD2      = 0x00000000
my_datapath.RD2E     = 0x00000000
my_datapath.REG_FILE_DATA = 0xffffffff8
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd       = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0xffffffff8
my_datapath.Rm       = 1000
my_datapath.Rn       = 0010
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x00000002
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000066
my_datapath.SrcBEData  = 0x00000000
my_datapath.StallID    = 1
my_datapath.StallIF    = 1
```

```
my_datapath.WA3E      = 1000
my_datapath.WA3M      = 0010
my_datapath.WA3W      = 0111
my_datapath.WriteDataM = 0x00000026
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG    = 0
my_datapath.Z_OUT     = 0
my_datapath.clk       = 1
my_datapath.reset     = 0
145000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0010
my_controller.ALUControlE = 0100
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 1
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE    = 1110
my_controller.CondEx   = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 010101
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 1
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 1
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op        = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
```

```

my_controller.RegWriteD = 0
my_controller.RegWriteE = 1
my_controller.RegWriteM = 0
my_controller.RegWriteW = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG = 0
my_controller.clk = 1
my_controller.reset = 0

146000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
146000.00ns DEBUG Performance Model PC:0x30 PC:0x30
146000.00ns DEBUG Performance Model Register:0: 0x0 0x0
146000.00ns DEBUG Performance Model Register:1: 0x13 0x13
146000.00ns DEBUG Performance Model Register:2: 0x26 0x26
146000.00ns DEBUG Performance Model Register:3: 0x2 0x2
146000.00ns DEBUG Performance Model Register:4: 0x4c 0x4c
146000.00ns DEBUG Performance Model Register:5: 0xa 0xa
146000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
146000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
146000.00ns DEBUG Performance Model Register:8: 0x0 0x0
146000.00ns DEBUG Performance Model Register:9: 0x0 0x0
146000.00ns DEBUG Performance Model Register:10: 0x0 0x0
146000.00ns DEBUG Performance Model Register:11: 0x0 0x0
146000.00ns DEBUG Performance Model Register:12: 0x0 0x0
146000.00ns DEBUG Performance Model Register:13: 0x0 0x0
146000.00ns DEBUG Performance Model Register:14: 0x0 0x0
146000.00ns DEBUG Performance Model Register:15: Not checked 0x34
***** Clock cycle: 14 *****
***** Current Instruction *****
Binary string:0001101000000000000000000000000010010
Operation type Branch (except Bx)
Link bit:0
imm24:18
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0010
my_datapath.ALUOutM = 0x00000068
my_datapath.ALUOutW = 0x00000068
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0

```

```
my_datapath.BranchTakenE = 0
my_datapath.Cond      = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0010
my_datapath.ExtImmD    = 0x00000008
my_datapath.ExtImmE    = 0x00000008
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE  = 00
my_datapath.ForwardBE  = 00
my_datapath.Funct      = 010101
my_datapath.ImmSrcD   = 00
my_datapath.Inst       = 0x520008
my_datapath.InstructionD = 0xe1520008
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0x1a000012
my_datapath.L          = 0
my_datapath.MemWriteM  = 0
my_datapath.MemtoRegW  = 0
my_datapath.Op         = 00
my_datapath.PCFetch    = 0x00000030
my_datapath.PCPlus4D   = 0x00000030
my_datapath.PCPlus4F   = 0x00000034
my_datapath.PCPlus8D   = 0x00000034
my_datapath.PCSrcW    = 0
my_datapath.PC_NEXT    = 0x00000034
my_datapath.PC_NEXT_NEXT = 0x00000034
my_datapath.RA1D      = 0010
my_datapath.RA1E      = 0000
my_datapath.RA2D      = 1000
my_datapath.RA2E      = 0000
my_datapath.RD1       = 0x00000026
my_datapath.RD1E      = 0x00000000
my_datapath.RD2       = 0x00000000
my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000068
my_datapath.ROT_VALUE = 00000000
my_datapath.Rd        = 0000
```

```

my_datapath.ReadDataM    = 0x00000026
my_datapath.ReadDataW    =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD     = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000068
my_datapath.Rm         = 1000
my_datapath.Rn         = 0010
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT  = 00000
my_datapath.SrcAE      = 0x00000000
my_datapath.SrcB       = 0x00000000
my_datapath.SrcBE      = 0x00000000
my_datapath.SrcBEData  = 0x00000000
my_datapath.StallID    = 0
my_datapath.StallF     = 0
my_datapath.WA3E       = 0000
my_datapath.WA3M       = 1000
my_datapath.WA3W       = 0010
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 0
my_datapath.Z_OUT      = 1
my_datapath.clk        = 1
my_datapath.reset      = 0
155000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0010
my_controller.ALUControlE = 0010
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 0
my_controller.BControl  = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond      = 1110
my_controller.CondE     = 1110
my_controller.CondEx   = 1
my_controller.FlagWriteD = 01

```

```

my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct      = 010101
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 1
my_controller.MemtoRegW  = 0
my_controller.Op         = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD = 0
my_controller.RegWriteE = 0
my_controller.RegWriteM = 1
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG     = 0
my_controller.clk        = 1
my_controller.reset      = 0
156000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
156000.00ns DEBUG Performance Model PC:0x34      PC:0x34
156000.00ns DEBUG Performance Model Register:0: 0x0      0x0
156000.00ns DEBUG Performance Model Register:1: 0x13     0x13
156000.00ns DEBUG Performance Model Register:2: 0x26     0x26
156000.00ns DEBUG Performance Model Register:3: 0x2      0x2
156000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
156000.00ns DEBUG Performance Model Register:5: 0xa      0xa
156000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
156000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
156000.00ns DEBUG Performance Model Register:8: 0x0      0x0
156000.00ns DEBUG Performance Model Register:9: 0x0      0x0
156000.00ns DEBUG Performance Model Register:10: 0x0     0x0
156000.00ns DEBUG Performance Model Register:11: 0x0     0x0

```

```
156000.00ns DEBUG Performance Model Register:12: 0x0 0x0
156000.00ns DEBUG Performance Model Register:13: 0x0 0x0
156000.00ns DEBUG Performance Model Register:14: 0x0 0x0
156000.00ns DEBUG Performance Model Register:15: Not checked 0x38
156000.00ns DEBUG Performance Model ***** Clock cycle: 15 *****
156000.00ns DEBUG Performance Model Computer is stalled for this cycle
165000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 0010
my_datapath.ALUOutM = 0x00000000
my_datapath.ALUOutW = 0x00000068
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0001
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 1000
my_datapath.ExtImmD = 0x00000048
my_datapath.ExtImmE = 0x00000008
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 01
my_datapath.Funct = 100000
my_datapath.ImmSrcD = 10
my_datapath.Inst = 0x000012
my_datapath.InstructionD = 0x1a000012
my_datapath.InstructionE = 0xe1520008
my_datapath.InstructionF = 0x0a000000
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 1
my_datapath.Op = 10
my_datapath.PCFetch = 0x00000034
my_datapath.PCPlus4D = 0x00000034
my_datapath.PCPlus4F = 0x00000038
my_datapath.PCPlus8D = 0x00000038
my_datapath.PCSrcW = 0
```

```
my_datapath.PC_NEXT      = 0x00000038
my_datapath.PC_NEXT_NEXT = 0x00000038
my_datapath.RA1D        = 1111
my_datapath.RA1E        = 0010
my_datapath.RA2D        = 0010
my_datapath.RA2E        = 1000
my_datapath.RD1         = 0x00000038
my_datapath.RD1E        = 0x00000026
my_datapath.RD2         = 0x00000026
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000026
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd          = 0000
my_datapath.ReadDataM   = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   = 0x00000026
my_datapath.RegSrcD    = 01
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000026
my_datapath.Rm          = 0010
my_datapath.Rn          = 0000
my_datapath.SHIFTED_DATA = 0x00000026
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000026
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE       = 0x00000026
my_datapath.SrcB        = 0x00000026
my_datapath.SrcBE       = 0x00000026
my_datapath.SrcBEData   = 0x00000026
my_datapath.StallID     = 0
my_datapath.StallF      = 0
my_datapath.WA3E        = 0000
my_datapath.WA3M        = 0000
my_datapath.WA3W        = 1000
my_datapath.WriteDataM  = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG      = 1
my_datapath.Z_OUT        = 1
my_datapath.clk          = 1
my_datapath.reset        = 0
```

165000.00ns DEBUG Performance Model **** DUT Controller Signals *****

```
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 0010
my_controller.ALUSrcD = 1
my_controller.ALUSrcE = 0
my_controller.BControl = 1
my_controller.BranchD = 1
my_controller.BranchE = 0
my_controller.BranchTakenE = 0
my_controller.Cond = 0001
my_controller.CondE = 1110
my_controller.CondEx = 1
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct = 100000
my_controller.ImmSrcD = 10
my_controller.MemWriteD = 0
my_controller.MemWriteE = 0
my_controller.MemWriteM = 0
my_controller.MemtoRegD = 0
my_controller.MemtoRegE = 0
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 1
my_controller.Op = 10
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 01
my_controller.RegWriteD = 0
my_controller.RegWriteE = 0
my_controller.RegWriteM = 0
my_controller.RegWriteW = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0
```

166000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****

```

166000.00ns DEBUG Performance Model      PC:0x38      PC:0x38
166000.00ns DEBUG Performance Model      Register:0: 0x0      0x0
166000.00ns DEBUG Performance Model      Register:1: 0x13     0x13
166000.00ns DEBUG Performance Model      Register:2: 0x26     0x26
166000.00ns DEBUG Performance Model      Register:3: 0x2      0x2
166000.00ns DEBUG Performance Model      Register:4: 0x4c     0x4c
166000.00ns DEBUG Performance Model      Register:5: 0xa      0xa
166000.00ns DEBUG Performance Model      Register:6: 0x80000002 0x80000002
166000.00ns DEBUG Performance Model      Register:7: 0xffffffff8 0xffffffff8
166000.00ns DEBUG Performance Model      Register:8: 0x26     0x26
166000.00ns DEBUG Performance Model      Register:9: 0x0      0x0
166000.00ns DEBUG Performance Model      Register:10: 0x0     0x0
166000.00ns DEBUG Performance Model      Register:11: 0x0     0x0
166000.00ns DEBUG Performance Model      Register:12: 0x0     0x0
166000.00ns DEBUG Performance Model      Register:13: 0x0     0x0
166000.00ns DEBUG Performance Model      Register:14: 0x0     0x0
166000.00ns DEBUG Performance Model      Register:15: Not checked 0x3c
166000.00ns DEBUG Performance Model      **** Clock cycle: 16 ****
166000.00ns DEBUG Performance Model      Computer is stalled for this cycle
175000.00ns DEBUG Performance Model      ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 0100
my_datapath.ALUOutM = 0x00000000
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x00000080
my_datapath.ALUSrcE = 1
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000048
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 100000
my_datapath.ImmSrcD = 10

```

```
my_datapath.Inst      = 0x000000
my_datapath.InstructionD = 0x0a000000
my_datapath.InstructionE = 0x1a000012
my_datapath.InstructionF = 0x00000000
my_datapath.L       = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op      = 10
my_datapath.PCFetch   = 0x00000038
my_datapath.PCPlus4D   = 0x00000038
my_datapath.PCPlus4F   = 0x0000003c
my_datapath.PCPlus8D   = 0x0000003c
my_datapath.PCSrcW    = 0
my_datapath.PC_NEXT   = 0x0000003c
my_datapath.PC_NEXT_NEXT = 0x0000003c
my_datapath.RA1D     = 1111
my_datapath.RA1E     = 1111
my_datapath.RA2D     = 0000
my_datapath.RA2E     = 0010
my_datapath.RD1      = 0x0000003c
my_datapath.RD1E     = 0x00000038
my_datapath.RD2      = 0x00000000
my_datapath.RD2E     = 0x00000026
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE = 00000000
my_datapath.Rd       = 0000
my_datapath.ReadDataM = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD   = 01
my_datapath.RegWriteW  = 0
my_datapath.ResultW   = 0x00000000
my_datapath.Rm       = 0000
my_datapath.Rn       = 0000
my_datapath.SHIFTED_DATA = 0x00000012
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA  = 0x00000012
my_datapath.SHIFT_SHAMT = 00000
my_datapath.SrcAE     = 0x00000038
my_datapath.SrcB      = 0x00000026
```

```
my_datapath.SrcBE      = 0x00000048
my_datapath.SrcBEData  = 0x00000012
my_datapath.StallID    = 0
my_datapath.StallIF    = 0
my_datapath.WA3E       = 0000
my_datapath.WA3M       = 0000
my_datapath.WA3W       = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 0
my_datapath.clk        = 1
my_datapath.reset      = 0
175000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 0100
my_controller.ALUSrcD   = 1
my_controller.ALUSrcE   = 1
my_controller.BControl  = 1
my_controller.BranchD   = 1
my_controller.BranchE   = 1
my_controller.BranchTakenE = 0
my_controller.Cond      = 0000
my_controller.CondE    = 0001
my_controller.CondEx   = 0
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 100000
my_controller.ImmSrcD  = 10
my_controller.MemWriteD = 0
my_controller.MemWriteE = 0
my_controller.MemWriteM = 0
my_controller.MemtoRegD = 0
my_controller.MemtoRegE = 0
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op        = 10
my_controller.PCSrcD   = 0
```

```

my_controller.PCSrcE      = 0
my_controller.PCSrcM      = 0
my_controller.PCSrcW      = 0
my_controller.RegSrcD     = 01
my_controller.RegWriteD    = 0
my_controller.RegWriteE    = 0
my_controller.RegWriteM    = 0
my_controller.RegWriteW    = 0
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG       = 1
my_controller.clk          = 1
my_controller.reset         = 0

176000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
176000.00ns DEBUG Performance Model PC:0x3c      PC:0x3c
176000.00ns DEBUG Performance Model Register:0: 0x0      0x0
176000.00ns DEBUG Performance Model Register:1: 0x13     0x13
176000.00ns DEBUG Performance Model Register:2: 0x26     0x26
176000.00ns DEBUG Performance Model Register:3: 0x2      0x2
176000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
176000.00ns DEBUG Performance Model Register:5: 0xa      0xa
176000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
176000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
176000.00ns DEBUG Performance Model Register:8: 0x26     0x26
176000.00ns DEBUG Performance Model Register:9: 0x0      0x0
176000.00ns DEBUG Performance Model Register:10: 0x0     0x0
176000.00ns DEBUG Performance Model Register:11: 0x0     0x0
176000.00ns DEBUG Performance Model Register:12: 0x0     0x0
176000.00ns DEBUG Performance Model Register:13: 0x0     0x0
176000.00ns DEBUG Performance Model Register:14: 0x0     0x0
176000.00ns DEBUG Performance Model Register:15: Not checked 0x40
176000.00ns DEBUG Performance Model ***** Clock cycle: 17 *****
176000.00ns DEBUG Performance Model ***** Current Instruction *****
176000.00ns DEBUG Performance Model Binary string:00001010000000000000000000000000
176000.00ns DEBUG Performance Model Operation type Branch (except Bx)
176000.00ns DEBUG Performance Model Link bit:0
176000.00ns DEBUG Performance Model imm24:0
185000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE   = 0100
my_datapath.ALUOutM        = 0x00000080

```

```
my_datapath.ALUOutW      = 0x00000000
my_datapath.ALUResultE   = 0x0000003c
my_datapath.ALUSrcE     = 1
my_datapath.BX           = 0
my_datapath.BranchTakenE = 1
my_datapath.Cond         = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out    = 0x00000000
my_datapath.DestSelect   = 0000
my_datapath.ExtImmD     = 0x00000000
my_datapath.ExtImmE     = 0x00000000
my_datapath.FlushD      = 1
my_datapath.FlushE      = 1
my_datapath.ForwardAE   = 00
my_datapath.ForwardBE   = 00
my_datapath.Funct        = 000000
my_datapath.ImmSrcD    = 00
my_datapath.Inst         = 0x000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x0a000000
my_datapath.InstructionF = 0xeb000002
my_datapath.L            = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op           = 00
my_datapath.PCFetch     = 0x0000003c
my_datapath.PCPlus4D    = 0x0000003c
my_datapath.PCPlus4F    = 0x00000040
my_datapath.PCPlus8D    = 0x00000040
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT      = 0x00000040
my_datapath.PC_NEXT_NEXT = 0x0000003c
my_datapath.RA1D         = 0000
my_datapath.RA1E         = 1111
my_datapath.RA2D         = 0000
my_datapath.RA2E         = 0000
my_datapath.RD1          = 0x00000000
my_datapath.RD1E         = 0x0000003c
my_datapath.RD2          = 0x00000000
```

```

my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd        = 0000
my_datapath.ReadDataM  =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000000
my_datapath.Rm        = 0000
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x0000000c
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData  = 0x00000000
my_datapath.StallID    = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000026
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 0
my_datapath.clk       = 1
my_datapath.reset     = 0
185000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0000
my_controller.ALUControlE = 0100
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 1
my_controller.BControl  = 0
my_controller.BranchD  = 0
my_controller.BranchE  = 1
my_controller.BranchTakenE = 1

```

```

my_controller.Cond      = 0000
my_controller.CondE    = 0000
my_controller.CondEx   = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct     = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op        = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD  = 1
my_controller.RegWriteE  = 0
my_controller.RegWriteM  = 0
my_controller.RegWriteW  = 0
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG     = 1
my_controller.clk       = 1
my_controller.reset     = 0

```

***** Performance Model / DUT Data *****

186000.00ns DEBUG Performance Model	PC:0x3c	PC:0x3c
186000.00ns DEBUG Performance Model	Register:0: 0x0	0x0
186000.00ns DEBUG Performance Model	Register:1: 0x13	0x13
186000.00ns DEBUG Performance Model	Register:2: 0x26	0x26
186000.00ns DEBUG Performance Model	Register:3: 0x2	0x2
186000.00ns DEBUG Performance Model	Register:4: 0x4c	0x4c
186000.00ns DEBUG Performance Model	Register:5: 0xa	0xa
186000.00ns DEBUG Performance Model	Register:6: 0x80000002	0x80000002
186000.00ns DEBUG Performance Model	Register:7: 0xffffffff8	0xffffffff8

```
186000.00ns DEBUG Performance Model Register:8: 0x26 0x26
186000.00ns DEBUG Performance Model Register:9: 0x0 0x0
186000.00ns DEBUG Performance Model Register:10: 0x0 0x0
186000.00ns DEBUG Performance Model Register:11: 0x0 0x0
186000.00ns DEBUG Performance Model Register:12: 0x0 0x0
186000.00ns DEBUG Performance Model Register:13: 0x0 0x0
186000.00ns DEBUG Performance Model Register:14: 0x0 0x0
186000.00ns DEBUG Performance Model Register:15: Not checked 0x40
186000.00ns DEBUG Performance Model **** Clock cycle: 18 *****
186000.00ns DEBUG Performance Model Computer is stalled for this cycle
195000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x0000003c
my_datapath.ALUOutW = 0x00000080
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 00
my_datapath.ForwardBE = 00
my_datapath.Funct = 000000
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x0000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xeb000002
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x0000003c
```

```
my_datapath.PCPlus4D      = 0x00000000
my_datapath.PCPlus4F      = 0x00000040
my_datapath.PCPlus8D      = 0x00000040
my_datapath.PCSrcW        = 0
my_datapath.PC_NEXT       = 0x00000040
my_datapath.PC_NEXT_NEXT  = 0x00000040
my_datapath.RA1D          = 0000
my_datapath.RA1E          = 0000
my_datapath.RA2D          = 0000
my_datapath.RA2E          = 0000
my_datapath.RD1           = 0x00000000
my_datapath.RD1E          = 0x00000000
my_datapath.RD2           = 0x00000000
my_datapath.RD2E          = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000080
my_datapath.ROT_VALUE     = 00000000
my_datapath.Rd            = 0000
my_datapath.ReadDataM     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD       = 00
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x00000080
my_datapath.Rm            = 0000
my_datapath.Rn            = 0000
my_datapath.SHIFTED_DATA  = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA    = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE         = 0x00000000
my_datapath.SrcB          = 0x00000000
my_datapath.SrcBE         = 0x00000000
my_datapath.SrcBEData    = 0x00000000
my_datapath.StallD        = 0
my_datapath.StallF        = 0
my_datapath.WA3E          = 0000
my_datapath.WA3M          = 0000
my_datapath.WA3W          = 0000
my_datapath.WriteDataM    = 0x00000000
my_datapath.Write_Z_ENABLE = 1
```

```
my_datapath.Z_FLAG      = 1
my_datapath.Z_OUT       = 1
my_datapath.clk         = 1
my_datapath.reset        = 0
195000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD = 0000
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD    = 0
my_controller.BranchE    = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 0000
my_controller.CondE       = 0000
my_controller.CondEx     = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct       = 000000
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 0
my_controller.RegWriteW   = 0
my_controller.Write_Z_ENABLE = 1
```

```

my_controller.Z_FLAG      = 1
my_controller.clk        = 1
my_controller.reset      = 0
196000.00ns DEBUG  Performance Model ***** Performance Model / DUT Data *****
196000.00ns DEBUG  Performance Model PC:0x40      PC:0x40
196000.00ns DEBUG  Performance Model Register:0: 0x0      0x0
196000.00ns DEBUG  Performance Model Register:1: 0x13     0x13
196000.00ns DEBUG  Performance Model Register:2: 0x26     0x26
196000.00ns DEBUG  Performance Model Register:3: 0x2      0x2
196000.00ns DEBUG  Performance Model Register:4: 0x4c     0x4c
196000.00ns DEBUG  Performance Model Register:5: 0xa      0xa
196000.00ns DEBUG  Performance Model Register:6: 0x80000002 0x80000002
196000.00ns DEBUG  Performance Model Register:7: 0xffffffff8 0xffffffff8
196000.00ns DEBUG  Performance Model Register:8: 0x26     0x26
196000.00ns DEBUG  Performance Model Register:9: 0x0      0x0
196000.00ns DEBUG  Performance Model Register:10: 0x0     0x0
196000.00ns DEBUG  Performance Model Register:11: 0x0     0x0
196000.00ns DEBUG  Performance Model Register:12: 0x0     0x0
196000.00ns DEBUG  Performance Model Register:13: 0x0     0x0
196000.00ns DEBUG  Performance Model Register:14: 0x0     0x0
196000.00ns DEBUG  Performance Model Register:15: Not checked 0x44
***** Clock cycle: 19 *****
Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE  = 0000
my_datapath.ALUOutM     = 0x00000000
my_datapath.ALUOutW     = 0x0000003c
my_datapath.ALUResultE  = 0x00000000
my_datapath.ALUSrcE     = 0
my_datapath.BX          = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond        = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out    = 0x00000000
my_datapath.DestSelect   = 1110
my_datapath.ExtImmD     = 0x00000008
my_datapath.ExtImmE     = 0x00000000
my_datapath.FlushD      = 0
my_datapath.FlushE      = 0

```

```
my_datapath.ForwardAE    = 10
my_datapath.ForwardBE    = 10
my_datapath.Funct        = 110000
my_datapath.ImmSrcD     = 10
my_datapath.Inst         = 0x000002
my_datapath.InstructionD = 0xeb000002
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe3a00e33
my_datapath.L            = 1
my_datapath.MemWriteM    = 0
my_datapath.MemtoRegW    = 0
my_datapath.Op           = 10
my_datapath.PCFetch      = 0x00000040
my_datapath.PCPlus4D     = 0x00000040
my_datapath.PCPlus4F     = 0x00000044
my_datapath.PCPlus8D     = 0x00000044
my_datapath.PCSrcW       = 0
my_datapath.PC_NEXT       = 0x00000044
my_datapath.PC_NEXT_NEXT = 0x00000044
my_datapath.RA1D          = 1111
my_datapath.RA1E          = 0000
my_datapath.RA2D          = 0000
my_datapath.RA2E          = 0000
my_datapath.RD1           = 0x00000044
my_datapath.RD1E          = 0x00000000
my_datapath.RD2           = 0x00000000
my_datapath.RD2E          = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000040
my_datapath.ROT_VALUE     = 00000000
my_datapath.Rd             = 0000
my_datapath.ReadDataM     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW     = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD       = 11
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x0000003c
my_datapath.Rm             = 0010
my_datapath.Rn             = 0000
my_datapath.SHIFTED_DATA  = 0x00000000
my_datapath.SHIFT_CONTROL = 00
```

```

my_datapath.SHIFT_DATA    = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE        = 0x00000000
my_datapath.SrcB          = 0x00000000
my_datapath.SrcBE        = 0x00000000
my_datapath.SrcBEData   = 0x00000000
my_datapath.StallID      = 0
my_datapath.StallF       = 0
my_datapath.WA3E         = 0000
my_datapath.WA3M         = 0000
my_datapath.WA3W         = 0000
my_datapath.WriteDataM  = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG       = 1
my_datapath.Z_OUT         = 1
my_datapath.clk          = 1
my_datapath.reset         = 0
205000.00ns DEBUG  Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 0100
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 1
my_controller.ALUSrcE    = 0
my_controller.BControl   = 1
my_controller.BranchD   = 1
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 1110
my_controller.CondE     = 0000
my_controller.CondEx    = 1
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct      = 110000
my_controller.ImmSrcD   = 10
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0

```

```
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op = 10
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 11
my_controller.RegWriteD = 1
my_controller.RegWriteE = 1
my_controller.RegWriteM = 1
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0

206000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
206000.00ns DEBUG Performance Model PC:0x44 PC:0x44
206000.00ns DEBUG Performance Model Register:0: 0x0 0x0
206000.00ns DEBUG Performance Model Register:1: 0x13 0x13
206000.00ns DEBUG Performance Model Register:2: 0x26 0x26
206000.00ns DEBUG Performance Model Register:3: 0x2 0x2
206000.00ns DEBUG Performance Model Register:4: 0x4c 0x4c
206000.00ns DEBUG Performance Model Register:5: 0xa 0xa
206000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
206000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
206000.00ns DEBUG Performance Model Register:8: 0x26 0x26
206000.00ns DEBUG Performance Model Register:9: 0x0 0x0
206000.00ns DEBUG Performance Model Register:10: 0x0 0x0
206000.00ns DEBUG Performance Model Register:11: 0x0 0x0
206000.00ns DEBUG Performance Model Register:12: 0x0 0x0
206000.00ns DEBUG Performance Model Register:13: 0x0 0x0
206000.00ns DEBUG Performance Model Register:14: 0x0 0x40
206000.00ns DEBUG Performance Model Register:15: Not checked 0x48
206000.00ns DEBUG Performance Model ***** Clock cycle: 20 *****
206000.00ns DEBUG Performance Model ***** Current Instruction *****
206000.00ns DEBUG Performance Model Binary string:111010110000000000000000000000010
206000.00ns DEBUG Performance Model Operation type Branch (except Bx)
206000.00ns DEBUG Performance Model Link bit:1
```

```
206000.00ns DEBUG Performance Model      imm24:2
215000.00ns DEBUG Performance Model      **** DUT DATAPATH Signals ****
my_datapath.ALUControlE    = 0100
my_datapath.ALUOutM        = 0x00000000
my_datapath.ALUOutW        = 0x00000000
my_datapath.ALUResultE     = 0x0000004c
my_datapath.ALUSrcE       = 1
my_datapath.BX            = 0
my_datapath.BranchTakenE  = 1
my_datapath.Cond          = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out      = 0x00000000
my_datapath.DestSelect     = 0000
my_datapath.ExtImmD       = 0x00000033
my_datapath.ExtImmE       = 0x00000008
my_datapath.FlushD        = 1
my_datapath.FlushE        = 1
my_datapath.ForwardAE     = 00
my_datapath.ForwardBE     = 10
my_datapath.Funct          = 111010
my_datapath.ImmSrcD       = 00
my_datapath.Inst           = 0xa00e33
my_datapath.InstructionD  = 0xe3a00e33
my_datapath.InstructionE  = 0xeb000002
my_datapath.InstructionF  = 0x00000000
my_datapath.L              = 0
my_datapath.MemWriteM      = 0
my_datapath.MemtoRegW      = 0
my_datapath.Op             = 00
my_datapath.PCFetch        = 0x00000044
my_datapath.PCPlus4D       = 0x00000044
my_datapath.PCPlus4F       = 0x00000048
my_datapath.PCPlus8D       = 0x00000048
my_datapath.PCSrcW         = 0
my_datapath.PC_NEXT         = 0x00000048
my_datapath.PC_NEXT_NEXT   = 0x0000004c
my_datapath.RA1D           = 0000
my_datapath.RA1E           = 1111
my_datapath.RA2D           = 0011
```

```

my_datapath.RA2E      = 0000
my_datapath.RD1       = 0x00000000
my_datapath.RD1E      = 0x00000044
my_datapath.RD2       = 0x00000002
my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd        = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000000
my_datapath.Rm        = 0011
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000002
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA   = 0x00000002
my_datapath.SHIFT_SHAMT  = 00000
my_datapath.SrcAE      = 0x00000044
my_datapath.SrcB       = 0x00000000
my_datapath.SrcBE      = 0x00000008
my_datapath.SrcBEData   = 0x00000002
my_datapath.StallID     = 0
my_datapath.StallF      = 0
my_datapath.WA3E       = 0000
my_datapath.WA3M       = 0000
my_datapath.WA3W       = 0000
my_datapath.WriteDataM  = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG      = 1
my_datapath.Z_OUT        = 0
my_datapath.clk         = 1
my_datapath.reset        = 0
215000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControID = 1101
my_controller.ALUControE  = 0100
my_controller.ALUSrcD     = 0
my_controller.ALUSrcE     = 1

```

```

my_controller.BControl      = 0
my_controller.BranchD      = 0
my_controller.BranchE      = 1
my_controller.BranchTakenE = 1
my_controller.Cond          = 1110
my_controller.CondE         = 1110
my_controller.CondEx        = 1
my_controller.FlagWriteD   = 00
my_controller.FlagWriteE   = 00
my_controller.FuncControl   = 0
my_controller.Funct         = 111010
my_controller.ImmSrcD      = 00
my_controller.MemWriteD    = 0
my_controller.MemWriteE    = 0
my_controller.MemWriteM    = 0
my_controller.MemtoRegD    = 0
my_controller.MemtoRegE    = 0
my_controller.MemtoRegM    = 0
my_controller.MemtoRegW    = 0
my_controller.Op            = 00
my_controller.PCSrcD       = 0
my_controller.PCSrcE       = 0
my_controller.PCSrcM       = 0
my_controller.PCSrcW       = 0
my_controller.RegSrcD      = 00
my_controller.RegWriteD    = 1
my_controller.RegWriteE    = 0
my_controller.RegWriteM    = 1
my_controller.RegWriteW    = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG        = 1
my_controller.clk           = 1
my_controller.reset          = 0

```

216000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****

216000.00ns DEBUG Performance Model	PC:0x4c	PC:0x4c
216000.00ns DEBUG Performance Model	Register:0:	0x0
216000.00ns DEBUG Performance Model	Register:1:	0x13
216000.00ns DEBUG Performance Model	Register:2:	0x26
216000.00ns DEBUG Performance Model	Register:3:	0x2

```

216000.00ns DEBUG Performance Model      Register:4: 0x4c    0x4c
216000.00ns DEBUG Performance Model      Register:5: 0xa     0xa
216000.00ns DEBUG Performance Model      Register:6: 0x80000002 0x80000002
216000.00ns DEBUG Performance Model      Register:7: 0xffffffff8 0xffffffff8
216000.00ns DEBUG Performance Model      Register:8: 0x26    0x26
216000.00ns DEBUG Performance Model      Register:9: 0x0     0x0
216000.00ns DEBUG Performance Model      Register:10: 0x0    0x0
216000.00ns DEBUG Performance Model      Register:11: 0x0    0x0
216000.00ns DEBUG Performance Model      Register:12: 0x0    0x0
216000.00ns DEBUG Performance Model      Register:13: 0x0    0x0
216000.00ns DEBUG Performance Model      Register:14: 0x0    0x40
216000.00ns DEBUG Performance Model      Register:15: Not checked 0x50
***** Clock cycle: 21 *****
216000.00ns DEBUG Performance Model      Computer is stalled for this cycle
225000.00ns DEBUG Performance Model      ***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 1101
my_datapath.ALUOutM = 0x0000004c
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000033
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 01
my_datapath.ForwardBE = 01
my_datapath.Funct = 000000
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x00000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe12fff1e
my_datapath.L = 0

```

```
my_datapath.MemWriteM      = 0
my_datapath.MemtoRegW      = 0
my_datapath.Op             = 00
my_datapath.PCFetch        = 0x0000004c
my_datapath.PCPlus4D       = 0x00000000
my_datapath.PCPlus4F       = 0x00000050
my_datapath.PCPlus8D       = 0x00000050
my_datapath.PCSrcW         = 0
my_datapath.PC_NEXT         = 0x00000050
my_datapath.PC_NEXT_NEXT   = 0x00000050
my_datapath.RA1D           = 0000
my_datapath.RA1E           = 0000
my_datapath.RA2D           = 0000
my_datapath.RA2E           = 0000
my_datapath.RD1            = 0x00000000
my_datapath.RD1E           = 0x00000000
my_datapath.RD2            = 0x00000000
my_datapath.RD2E           = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE      = 00000000
my_datapath.Rd              = 0000
my_datapath.ReadDataM      = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW      = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD        = 00
my_datapath.RegWriteW       = 1
my_datapath.ResultW        = 0x00000000
my_datapath.Rm              = 0000
my_datapath.Rn              = 0000
my_datapath.SHIFTED_DATA   = 0x00000000
my_datapath.SHIFT_CONTROL  = 00
my_datapath.SHIFT_DATA     = 0x00000000
my_datapath.SHIFT_SHAMT    = 00000
my_datapath.SrcAE          = 0x00000000
my_datapath.SrcB           = 0x00000000
my_datapath.SrcBE          = 0x00000000
my_datapath.SrcBEData      = 0x00000000
my_datapath.StallID        = 0
my_datapath.StallF          = 0
my_datapath.WA3E           = 0000
```

```
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 1
my_datapath.clk        = 1
my_datapath.reset       = 0
225000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControlD = 0000
my_controller.ALUControlE = 1101
my_controller.ALUSrcD   = 0
my_controller.ALUSrcE   = 0
my_controller.BControl   = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 0000
my_controller.CondE     = 1110
my_controller.CondEx    = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct      = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op         = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD  = 1
```

```

my_controller.RegWriteE    = 1
my_controller.RegWriteM    = 0
my_controller.RegWriteW    = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG      = 1
my_controller.clk         = 1
my_controller.reset        = 0

226000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
226000.00ns DEBUG Performance Model PC:0x50      PC:0x50
226000.00ns DEBUG Performance Model Register:0: 0x0      0x0
226000.00ns DEBUG Performance Model Register:1: 0x13     0x13
226000.00ns DEBUG Performance Model Register:2: 0x26     0x26
226000.00ns DEBUG Performance Model Register:3: 0x2      0x2
226000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
226000.00ns DEBUG Performance Model Register:5: 0xa      0xa
226000.00ns DEBUG Performance Model Register:6: 0x80000002  0x80000002
226000.00ns DEBUG Performance Model Register:7: 0xffffffff8  0xffffffff8
226000.00ns DEBUG Performance Model Register:8: 0x26     0x26
226000.00ns DEBUG Performance Model Register:9: 0x0      0x0
226000.00ns DEBUG Performance Model Register:10: 0x0     0x0
226000.00ns DEBUG Performance Model Register:11: 0x0     0x0
226000.00ns DEBUG Performance Model Register:12: 0x0     0x0
226000.00ns DEBUG Performance Model Register:13: 0x0     0x0
226000.00ns DEBUG Performance Model Register:14: 0x0     0x40
226000.00ns DEBUG Performance Model Register:15: Not checked 0x54
***** Clock cycle: 22 *****
226000.00ns DEBUG Performance Model Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE   = 0000
my_datapath.ALUOutM       = 0x00000000
my_datapath.ALUOutW       = 0x0000004c
my_datapath.ALUResultE    = 0x00000000
my_datapath.ALUSrcE       = 0
my_datapath.BX             = 0
my_datapath.BranchTakenE  = 0
my_datapath.Cond           = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out      = 0x00000000
my_datapath.DestSelect     = 0000

```

```
my_datapath.ExtImmD      = 0x0000001e
my_datapath.ExtImmE      = 0x00000000
my_datapath.FlushD      = 0
my_datapath.FlushE      = 0
my_datapath.ForwardAE    = 10
my_datapath.ForwardBE    = 10
my_datapath.Funct        = 010010
my_datapath.ImmSrcD     = 00
my_datapath.Inst         = 0x2fff1e
my_datapath.InstructionD = 0xe12fff1e
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0x00000000
my_datapath.L            = 0
my_datapath.MemWriteM    = 0
my_datapath.MemtoRegW    = 0
my_datapath.Op           = 00
my_datapath.PCFetch      = 0x00000050
my_datapath.PCPlus4D     = 0x00000050
my_datapath.PCPlus4F     = 0x00000054
my_datapath.PCPlus8D     = 0x00000054
my_datapath.PCSrcW       = 0
my_datapath.PC_NEXT      = 0x00000054
my_datapath.PC_NEXT_NEXT = 0x00000054
my_datapath.RA1D          = 1111
my_datapath.RA1E          = 0000
my_datapath.RA2D          = 1110
my_datapath.RA2E          = 0000
my_datapath.RD1           = 0x00000054
my_datapath.RD1E          = 0x00000000
my_datapath.RD2           = 0x00000040
my_datapath.RD2E          = 0x00000000
my_datapath.REG_FILE_DATA = 0x0000004c
my_datapath.ROT_VALUE     = 00000000
my_datapath.Rd             = 1111
my_datapath.ReadDataM     =xxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW     =xxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD      = 00
my_datapath.RegWriteW     = 0
my_datapath.ResultW       = 0x0000004c
```

```

my_datapath.Rm      = 1110
my_datapath.Rn      = 1111
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT  = 00000
my_datapath.SrcAE     = 0x00000000
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData = 0x00000000
my_datapath.StallD    = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 1
my_datapath.clk        = 1
my_datapath.reset      = 0
235000.00ns DEBUG  Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD    = 1
my_controller.BranchE    = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 1110
my_controller.CondE     = 0000
my_controller.CondEx    = 1
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct      = 010010
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0

```

```

my_controller.MemWriteE = 0
my_controller.MemWriteM = 0
my_controller.MemtoRegD = 0
my_controller.MemtoRegE = 0
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op = 00
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 00
my_controller.RegWriteD = 0
my_controller.RegWriteE = 1
my_controller.RegWriteM = 1
my_controller.RegWriteW = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0

236000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
236000.00ns DEBUG Performance Model PC:0x54 PC:0x54
236000.00ns DEBUG Performance Model Register:0: 0x0 0x0
236000.00ns DEBUG Performance Model Register:1: 0x13 0x13
236000.00ns DEBUG Performance Model Register:2: 0x26 0x26
236000.00ns DEBUG Performance Model Register:3: 0x2 0x2
236000.00ns DEBUG Performance Model Register:4: 0x4c 0x4c
236000.00ns DEBUG Performance Model Register:5: 0xa 0xa
236000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
236000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
236000.00ns DEBUG Performance Model Register:8: 0x26 0x26
236000.00ns DEBUG Performance Model Register:9: 0x0 0x0
236000.00ns DEBUG Performance Model Register:10: 0x0 0x0
236000.00ns DEBUG Performance Model Register:11: 0x0 0x0
236000.00ns DEBUG Performance Model Register:12: 0x0 0x0
236000.00ns DEBUG Performance Model Register:13: 0x0 0x0
236000.00ns DEBUG Performance Model Register:14: 0x0 0x40
236000.00ns DEBUG Performance Model Register:15: Not checked 0x58
236000.00ns DEBUG Performance Model ***** Clock cycle: 23 *****

```

```
236000.00ns DEBUG Performance Model ***** Current Instruction *****  
236000.00ns DEBUG Performance Model Binary string:111000010010111111111100011110  
236000.00ns DEBUG Performance Model Operation type BX  
236000.00ns DEBUG Performance Model Rm: 14  
245000.00ns DEBUG Performance Model ***** DUT DATAPATH Signals *****  
my_datapath.ALUControlE = 1101  
my_datapath.ALUOutM = 0x00000000  
my_datapath.ALUOutW = 0x00000000  
my_datapath.ALUResultE = 0x00000040  
my_datapath.ALUSrcE = 0  
my_datapath.BX = 1  
my_datapath.BranchTakenE = 1  
my_datapath.Cond = 0000  
my_datapath.Debug_Source_select= zzzz  
my_datapath.Debug_out = 0x00000000  
my_datapath.DestSelect = 0000  
my_datapath.ExtImmD = 0x00000000  
my_datapath.ExtImmE = 0x0000001e  
my_datapath.FlushD = 1  
my_datapath.FlushE = 1  
my_datapath.ForwardAE = 00  
my_datapath.ForwardBE = 00  
my_datapath.Funct = 000000  
my_datapath.ImmSrcD = 00  
my_datapath.Inst = 0x0000000  
my_datapath.InstructionD = 0x00000000  
my_datapath.InstructionE = 0xe12fff1e  
my_datapath.InstructionF = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx  
my_datapath.L = 0  
my_datapath.MemWriteM = 0  
my_datapath.MemtoRegW = 0  
my_datapath.Op = 00  
my_datapath.PCFetch = 0x00000054  
my_datapath.PCPlus4D = 0x00000054  
my_datapath.PCPlus4F = 0x00000058  
my_datapath.PCPlus8D = 0x00000058  
my_datapath.PCSrcW = 0  
my_datapath.PC_NEXT = 0x00000058  
my_datapath.PC_NEXT_NEXT = 0x00000040
```

```

my_datapath.RA1D      = 0000
my_datapath.RA1E      = 1111
my_datapath.RA2D      = 0000
my_datapath.RA2E      = 1110
my_datapath.RD1       = 0x00000000
my_datapath.RD1E      = 0x00000054
my_datapath.RD2       = 0x00000000
my_datapath.RD2E      = 0x00000040
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 11111110
my_datapath.Rd        = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000000
my_datapath.Rm        = 0000
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000040
my_datapath.SHIFT_SHAMT   = 1110
my_datapath.SrcAE      = 0x00000054
my_datapath.SrcB       = 0x00000040
my_datapath.SrcBE      = 0x00000040
my_datapath.SrcBEData  = 0x00000040
my_datapath.StallID    = 0
my_datapath.StallF    = 0
my_datapath.WA3E      = 1111
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 0
my_datapath.clk        = 1
my_datapath.reset      = 0
245000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlID = 0000

```

```

my_controller.ALUControlE = 1101
my_controller.ALUSrcD = 0
my_controller.ALUSrcE = 0
my_controller.BControl = 0
my_controller.BranchD = 0
my_controller.BranchE = 1
my_controller.BranchTakenE = 1
my_controller.Cond = 0000
my_controller.CondE = 1110
my_controller.CondEx = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl = 0
my_controller.Funct = 000000
my_controller.ImmSrcD = 00
my_controller.MemWriteD = 0
my_controller.MemWriteE = 0
my_controller.MemWriteM = 0
my_controller.MemtoRegD = 0
my_controller.MemtoRegE = 0
my_controller.MemtoRegM = 0
my_controller.MemtoRegW = 0
my_controller.Op = 00
my_controller.PCSrcD = 0
my_controller.PCSrcE = 0
my_controller.PCSrcM = 0
my_controller.PCSrcW = 0
my_controller.RegSrcD = 00
my_controller.RegWriteD = 1
my_controller.RegWriteE = 0
my_controller.RegWriteM = 1
my_controller.RegWriteW = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG = 1
my_controller.clk = 1
my_controller.reset = 0

```

***** Performance Model / DUT Data *****

246000.00ns DEBUG Performance Model	PC:0x40	PC:0x40
246000.00ns DEBUG Performance Model	Register:0:	0x0
246000.00ns DEBUG Performance Model		

```

246000.00ns DEBUG Performance Model Register:1: 0x13 0x13
246000.00ns DEBUG Performance Model Register:2: 0x26 0x26
246000.00ns DEBUG Performance Model Register:3: 0x2 0x2
246000.00ns DEBUG Performance Model Register:4: 0x4c 0x4c
246000.00ns DEBUG Performance Model Register:5: 0xa 0xa
246000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
246000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
246000.00ns DEBUG Performance Model Register:8: 0x26 0x26
246000.00ns DEBUG Performance Model Register:9: 0x0 0x0
246000.00ns DEBUG Performance Model Register:10: 0x0 0x0
246000.00ns DEBUG Performance Model Register:11: 0x0 0x0
246000.00ns DEBUG Performance Model Register:12: 0x0 0x0
246000.00ns DEBUG Performance Model Register:13: 0x0 0x0
246000.00ns DEBUG Performance Model Register:14: 0x0 0x40
246000.00ns DEBUG Performance Model Register:15: Not checked 0x44
246000.00ns DEBUG Performance Model ***** Clock cycle: 24 *****
246000.00ns DEBUG Performance Model ***** Current Instruction *****
246000.00ns DEBUG Performance Model Binary string:1110001110100000000111000110011
246000.00ns DEBUG Performance Model Operation type Data Processing
246000.00ns DEBUG Performance Model cond:E
246000.00ns DEBUG Performance Model Immediate bit:1
246000.00ns DEBUG Performance Model cmd:D
246000.00ns DEBUG Performance Model Set bit:0
246000.00ns DEBUG Performance Model Rn:0 Rd:0
246000.00ns DEBUG Performance Model rot:14 imm8:51
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000040
my_datapath.ALUOutW = 0x00000000
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x00000000
my_datapath.ExtImmE = 0x00000000

```

```
my_datapath.FlushD      = 0
my_datapath.FlushE      = 0
my_datapath.ForwardAE   = 01
my_datapath.ForwardBE   = 01
my_datapath.Funct       = 000000
my_datapath.ImmSrcD    = 00
my_datapath.Inst        = 0x0000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe3a00e33
my_datapath.L           = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op          = 00
my_datapath.PCFetch     = 0x00000040
my_datapath.PCPlus4D    = 0x00000000
my_datapath.PCPlus4F    = 0x00000044
my_datapath.PCPlus8D    = 0x00000044
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x00000044
my_datapath.PC_NEXT_NEXT = 0x00000044
my_datapath.RA1D        = 0000
my_datapath.RA1E        = 0000
my_datapath.RA2D        = 0000
my_datapath.RA2E        = 0000
my_datapath.RD1          = 0x00000000
my_datapath.RD1E        = 0x00000000
my_datapath.RD2          = 0x00000000
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd           = 0000
my_datapath.ReadDataM   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000000
my_datapath.Rm           = 0000
my_datapath.Rn           = 0000
```

```

my_datapath.SHIFTED_DATA  = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT  = 00000
my_datapath.SrcAE        = 0x00000000
my_datapath.SrcB         = 0x00000000
my_datapath.SrcBE        = 0x00000000
my_datapath.SrcBEData   = 0x00000000
my_datapath.StallID     = 0
my_datapath.StallF      = 0
my_datapath.WA3E         = 0000
my_datapath.WA3M         = 1111
my_datapath.WA3W         = 0000
my_datapath.WriteDataM  = 0x00000040
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG       = 1
my_datapath.Z_OUT        = 1
my_datapath.clk          = 1
my_datapath.reset         = 0
255000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControD = 0000
my_controller.ALUControE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 0000
my_controller.CondE      = 0000
my_controller.CondEx     = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct      = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0

```

```

my_controller.MemtoRegD      = 0
my_controller.MemtoRegE      = 0
my_controller.MemtoRegM      = 0
my_controller.MemtoRegW      = 0
my_controller.Op             = 00
my_controller.PCSrcD         = 0
my_controller.PCSrcE         = 0
my_controller.PCSrcM         = 0
my_controller.PCSrcW         = 0
my_controller.RegSrcD        = 00
my_controller.RegWriteD      = 1
my_controller.RegWriteE      = 1
my_controller.RegWriteM      = 0
my_controller.RegWriteW      = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG         = 1
my_controller.clk            = 1
my_controller.reset          = 0

256000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
256000.00ns DEBUG Performance Model PC:0x44      PC:0x44
256000.00ns DEBUG Performance Model Register:0: 0x0      0x0
256000.00ns DEBUG Performance Model Register:1: 0x13     0x13
256000.00ns DEBUG Performance Model Register:2: 0x26     0x26
256000.00ns DEBUG Performance Model Register:3: 0x2      0x2
256000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
256000.00ns DEBUG Performance Model Register:5: 0xa      0xa
256000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
256000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
256000.00ns DEBUG Performance Model Register:8: 0x26     0x26
256000.00ns DEBUG Performance Model Register:9: 0x0      0x0
256000.00ns DEBUG Performance Model Register:10: 0x0     0x0
256000.00ns DEBUG Performance Model Register:11: 0x0     0x0
256000.00ns DEBUG Performance Model Register:12: 0x0     0x0
256000.00ns DEBUG Performance Model Register:13: 0x0     0x0
256000.00ns DEBUG Performance Model Register:14: 0x40    0x40
256000.00ns DEBUG Performance Model Register:15: Not checked 0x48
***** Clock cycle: 25 *****
256000.00ns DEBUG Performance Model Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

```

```
my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000000
my_datapath.ALUOutW = 0x00000040
my_datapath.ALUResultE = 0x00000000
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 1111
my_datapath.ExtImmD = 0x00000033
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 10
my_datapath.ForwardBE = 10
my_datapath.Funct = 111010
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0xa00e33
my_datapath.InstructionD = 0xe3a00e33
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0x00000000
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x00000044
my_datapath.PCPlus4D = 0x00000044
my_datapath.PCPlus4F = 0x00000048
my_datapath.PCPlus8D = 0x00000048
my_datapath.PCSrcW = 0
my_datapath.PC_NEXT = 0x00000048
my_datapath.PC_NEXT_NEXT = 0x00000048
my_datapath.RA1D = 0000
my_datapath.RA1E = 0000
my_datapath.RA2D = 0011
my_datapath.RA2E = 0000
my_datapath.RD1 = 0x00000000
```

```

my_datapath.RD1E      = 0x00000000
my_datapath.RD2      = 0x00000002
my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000040
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd        = 0000
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 0
my_datapath.ResultW    = 0x00000040
my_datapath.Rm        = 0011
my_datapath.Rn        = 0000
my_datapath.SHIFTED_DATA = 0x00000000
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000000
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x00000000
my_datapath.SrcB      = 0x00000000
my_datapath.SrcBE     = 0x00000000
my_datapath.SrcBEData  = 0x00000000
my_datapath.StallID    = 0
my_datapath.StallIF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 1111
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 1
my_datapath.Z_OUT      = 1
my_datapath.clk        = 1
my_datapath.reset      = 0
265000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD   = 0

```

```

my_controller.BranchE      = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 0000
my_controller.CondEx     = 1
my_controller.FlagWriteD = 00
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct       = 111010
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 1
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 1
my_controller.RegWriteW   = 0
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG      = 1
my_controller.clk         = 1
my_controller.reset       = 0

```

***** Performance Model / DUT Data *****

266000.00ns DEBUG Performance Model	PC:0x-1	PC:0x48
266000.00ns DEBUG Performance Model	Register:0: 0x0	0x0
266000.00ns DEBUG Performance Model	Register:1: 0x13	0x13
266000.00ns DEBUG Performance Model	Register:2: 0x26	0x26
266000.00ns DEBUG Performance Model	Register:3: 0x2	0x2
266000.00ns DEBUG Performance Model	Register:4: 0x4c	0x4c
266000.00ns DEBUG Performance Model	Register:5: 0xa	0xa

```

266000.00ns DEBUG Performance Model      Register:6: 0x80000002 0x80000002
266000.00ns DEBUG Performance Model      Register:7: 0xffffffff8 0xffffffff8
266000.00ns DEBUG Performance Model      Register:8: 0x26      0x26
266000.00ns DEBUG Performance Model      Register:9: 0x0       0x0
266000.00ns DEBUG Performance Model      Register:10: 0x0     0x0
266000.00ns DEBUG Performance Model      Register:11: 0x0     0x0
266000.00ns DEBUG Performance Model      Register:12: 0x0     0x0
266000.00ns DEBUG Performance Model      Register:13: 0x0     0x0
266000.00ns DEBUG Performance Model      Register:14: 0x40    0x40
266000.00ns DEBUG Performance Model      Register:15: Not checked 0x4c
266000.00ns DEBUG Performance Model      **** Clock cycle: 26 ****
266000.00ns DEBUG Performance Model      Computer is stalled for this cycle
275000.00ns DEBUG Performance Model      ***** DUT DATAPATH Signals *****
my_datapath.ALUControlE = 1101
my_datapath.ALUOutM    = 0x00000000
my_datapath.ALUOutW    = 0x00000000
my_datapath.ALUResultE = 0x00000330
my_datapath.ALUSrcE    = 0
my_datapath.BX         = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond       = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out   = 0x00000000
my_datapath.DestSelect  = 0000
my_datapath.ExtImmD    = 0x00000000
my_datapath.ExtImmE    = 0x00000033
my_datapath.FlushD     = 0
my_datapath.FlushE     = 0
my_datapath.ForwardAE  = 10
my_datapath.ForwardBE  = 00
my_datapath.Funct      = 000000
my_datapath.ImmSrcD   = 00
my_datapath.Inst        = 0x000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0xe3a00e33
my_datapath.InstructionF = 0x00000000
my_datapath.L           = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0

```

```
my_datapath.Op      = 00
my_datapath.PCFetch = 0x00000048
my_datapath.PCPlus4D = 0x00000048
my_datapath.PCPlus4F = 0x0000004c
my_datapath.PCPlus8D = 0x0000004c
my_datapath.PCSrcW  = 0
my_datapath.PC_NEXT  = 0x0000004c
my_datapath.PC_NEXT_NEXT = 0x0000004c
my_datapath.RA1D    = 0000
my_datapath.RA1E    = 0000
my_datapath.RA2D    = 0000
my_datapath.RA2E    = 0011
my_datapath.RD1     = 0x00000000
my_datapath.RD1E   = 0x00000000
my_datapath.RD2     = 0x00000000
my_datapath.RD2E   = 0x00000002
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE = 11011100
my_datapath.Rd      = 0000
my_datapath.ReadDataM =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD = 00
my_datapath.RegWriteW = 1
my_datapath.ResultW = 0x00000000
my_datapath.Rm      = 0000
my_datapath.Rn      = 0000
my_datapath.SHIFTED_DATA = 0x00000330
my_datapath.SHIFT_CONTROL = 11
my_datapath.SHIFT_DATA = 0x00000033
my_datapath.SHIFT_SHAMT = 11100
my_datapath.SrcAE   = 0x00000000
my_datapath.SrcB    = 0x00000002
my_datapath.SrcBE   = 0x00000330
my_datapath.SrcBEData = 0x00000330
my_datapath.StallID = 0
my_datapath.StallF  = 0
my_datapath.WA3E    = 0000
my_datapath.WA3M    = 0000
my_datapath.WA3W    = 0000
```

```
my_datapath.WriteDataM    = 0x00000000
my_datapath.Write_Z_ENABLE = 0
my_datapath.Z_FLAG       = 1
my_datapath.Z_OUT        = 0
my_datapath.clk          = 1
my_datapath.reset         = 0
275000.00ns DEBUG  Performance Model      **** DUT Controller Signals ****
my_controller.ALUControID = 0000
my_controller.ALUControE  = 1101
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD   = 0
my_controller.BranchE   = 0
my_controller.BranchTakenE = 0
my_controller.Cond       = 0000
my_controller.CondE     = 1110
my_controller.CondEx    = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 00
my_controller.FuncControl= 0
my_controller.Funct     = 000000
my_controller.ImmSrcD   = 00
my_controller.MemWriteD  = 0
my_controller.MemWriteE  = 0
my_controller.MemWriteM  = 0
my_controller.MemtoRegD  = 0
my_controller.MemtoRegE  = 0
my_controller.MemtoRegM  = 0
my_controller.MemtoRegW  = 0
my_controller.Op         = 00
my_controller.PCSrcD    = 0
my_controller.PCSrcE    = 0
my_controller.PCSrcM    = 0
my_controller.PCSrcW    = 0
my_controller.RegSrcD   = 00
my_controller.RegWriteD  = 1
my_controller.RegWriteE  = 1
my_controller.RegWriteM  = 1
```

```

my_controller.RegWriteW    = 1
my_controller.Write_Z_ENABLE = 0
my_controller.Z_FLAG      = 1
my_controller.clk         = 1
my_controller.reset        = 0

276000.00ns DEBUG  Performance Model ***** Performance Model / DUT Data *****
276000.00ns DEBUG  Performance Model   PC:0x-1     PC:0x4c
276000.00ns DEBUG  Performance Model   Register:0: 0x0     0x0
276000.00ns DEBUG  Performance Model   Register:1: 0x13    0x13
276000.00ns DEBUG  Performance Model   Register:2: 0x26    0x26
276000.00ns DEBUG  Performance Model   Register:3: 0x2     0x2
276000.00ns DEBUG  Performance Model   Register:4: 0x4c    0x4c
276000.00ns DEBUG  Performance Model   Register:5: 0xa     0xa
276000.00ns DEBUG  Performance Model   Register:6: 0x80000002 0x80000002
276000.00ns DEBUG  Performance Model   Register:7: 0xffffffff8 0xfffffffff8
276000.00ns DEBUG  Performance Model   Register:8: 0x26    0x26
276000.00ns DEBUG  Performance Model   Register:9: 0x0     0x0
276000.00ns DEBUG  Performance Model   Register:10: 0x0    0x0
276000.00ns DEBUG  Performance Model   Register:11: 0x0    0x0
276000.00ns DEBUG  Performance Model   Register:12: 0x0    0x0
276000.00ns DEBUG  Performance Model   Register:13: 0x0    0x0
276000.00ns DEBUG  Performance Model   Register:14: 0x40   0x40
276000.00ns DEBUG  Performance Model   Register:15: Not checked 0x50
***** Clock cycle: 27 *****
Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

my_datapath.ALUControlE  = 0000
my_datapath.ALUOutM      = 0x00000330
my_datapath.ALUOutW      = 0x00000000
my_datapath.ALUResultE   = 0x00000330
my_datapath.ALUSrcE     = 0
my_datapath.BX           = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond         = 0000
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out    = 0x00000000
my_datapath.DestSelect   = 0000
my_datapath.ExtImmD     = 0x00000000
my_datapath.ExtImmE     = 0x00000000

```

```
my_datapath.FlushD      = 0
my_datapath.FlushE      = 0
my_datapath.ForwardAE   = 10
my_datapath.ForwardBE   = 10
my_datapath.Funct       = 000000
my_datapath.ImmSrcD    = 00
my_datapath.Inst        = 0x0000000
my_datapath.InstructionD = 0x00000000
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0xe12fff1e
my_datapath.L           = 0
my_datapath.MemWriteM   = 0
my_datapath.MemtoRegW   = 0
my_datapath.Op          = 00
my_datapath.PCFetch     = 0x0000004c
my_datapath.PCPlus4D    = 0x0000004c
my_datapath.PCPlus4F    = 0x00000050
my_datapath.PCPlus8D    = 0x00000050
my_datapath.PCSrcW     = 0
my_datapath.PC_NEXT     = 0x00000050
my_datapath.PC_NEXT_NEXT = 0x00000050
my_datapath.RA1D        = 0000
my_datapath.RA1E        = 0000
my_datapath.RA2D        = 0000
my_datapath.RA2E        = 0000
my_datapath.RD1         = 0x00000000
my_datapath.RD1E        = 0x00000000
my_datapath.RD2         = 0x00000000
my_datapath.RD2E        = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000000
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd          = 0000
my_datapath.ReadDataM   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW   =xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000000
my_datapath.Rm          = 0000
my_datapath.Rn          = 0000
```

```

my_datapath.SHIFTED_DATA = 0x00000330
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA = 0x00000330
my_datapath.SHIFT_SHAMT = 00000
my_datapath.SrcAE = 0x00000330
my_datapath.SrcB = 0x00000330
my_datapath.SrcBE = 0x00000330
my_datapath.SrcBEData = 0x00000330
my_datapath.StallID = 0
my_datapath.StallF = 0
my_datapath.WA3E = 0000
my_datapath.WA3M = 0000
my_datapath.WA3W = 0000
my_datapath.WriteDataM = 0x00000002
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG = 1
my_datapath.Z_OUT = 0
my_datapath.clk = 1
my_datapath.reset = 0
285000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControD = 0000
my_controller.ALUControE = 0000
my_controller.ALUSrcD = 0
my_controller.ALUSrcE = 0
my_controller.BControl = 0
my_controller.BranchD = 0
my_controller.BranchE = 0
my_controller.BranchTakenE = 0
my_controller.Cond = 0000
my_controller.CondE = 0000
my_controller.CondEx = 1
my_controller.FlagWriteD = 01
my_controller.FlagWriteE = 01
my_controller.FuncControl = 0
my_controller.Funct = 000000
my_controller.ImmSrcD = 00
my_controller.MemWriteD = 0
my_controller.MemWriteE = 0
my_controller.MemWriteM = 0

```

```

my_controller.MemtoRegD      = 0
my_controller.MemtoRegE      = 0
my_controller.MemtoRegM      = 0
my_controller.MemtoRegW      = 0
my_controller.Op             = 00
my_controller.PCSrcD         = 0
my_controller.PCSrcE         = 0
my_controller.PCSrcM         = 0
my_controller.PCSrcW         = 0
my_controller.RegSrcD        = 00
my_controller.RegWriteD      = 1
my_controller.RegWriteE      = 1
my_controller.RegWriteM      = 1
my_controller.RegWriteW      = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG         = 1
my_controller.clk            = 1
my_controller.reset          = 0

286000.00ns DEBUG Performance Model ***** Performance Model / DUT Data *****
286000.00ns DEBUG Performance Model PC:0x-1      PC:0x50
286000.00ns DEBUG Performance Model Register:0: 0x0      0x0
286000.00ns DEBUG Performance Model Register:1: 0x13     0x13
286000.00ns DEBUG Performance Model Register:2: 0x26     0x26
286000.00ns DEBUG Performance Model Register:3: 0x2      0x2
286000.00ns DEBUG Performance Model Register:4: 0x4c     0x4c
286000.00ns DEBUG Performance Model Register:5: 0xa      0xa
286000.00ns DEBUG Performance Model Register:6: 0x80000002 0x80000002
286000.00ns DEBUG Performance Model Register:7: 0xffffffff8 0xffffffff8
286000.00ns DEBUG Performance Model Register:8: 0x26     0x26
286000.00ns DEBUG Performance Model Register:9: 0x0      0x0
286000.00ns DEBUG Performance Model Register:10: 0x0     0x0
286000.00ns DEBUG Performance Model Register:11: 0x0     0x0
286000.00ns DEBUG Performance Model Register:12: 0x0     0x0
286000.00ns DEBUG Performance Model Register:13: 0x0     0x0
286000.00ns DEBUG Performance Model Register:14: 0x40    0x40
286000.00ns DEBUG Performance Model Register:15: Not checked 0x54
***** Clock cycle: 28 *****
286000.00ns DEBUG Performance Model Computer is stalled for this cycle
***** DUT DATAPATH Signals *****

```

```
my_datapath.ALUControlE = 0000
my_datapath.ALUOutM = 0x00000330
my_datapath.ALUOutW = 0x00000330
my_datapath.ALUResultE = 0x00000330
my_datapath.ALUSrcE = 0
my_datapath.BX = 0
my_datapath.BranchTakenE = 0
my_datapath.Cond = 1110
my_datapath.Debug_Source_select= zzzz
my_datapath.Debug_out = 0x00000000
my_datapath.DestSelect = 0000
my_datapath.ExtImmD = 0x0000001e
my_datapath.ExtImmE = 0x00000000
my_datapath.FlushD = 0
my_datapath.FlushE = 0
my_datapath.ForwardAE = 10
my_datapath.ForwardBE = 10
my_datapath.Funct = 010010
my_datapath.ImmSrcD = 00
my_datapath.Inst = 0x2fff1e
my_datapath.InstructionD = 0xe12fff1e
my_datapath.InstructionE = 0x00000000
my_datapath.InstructionF = 0x00000000
my_datapath.L = 0
my_datapath.MemWriteM = 0
my_datapath.MemtoRegW = 0
my_datapath.Op = 00
my_datapath.PCFetch = 0x00000050
my_datapath.PCPlus4D = 0x00000050
my_datapath.PCPlus4F = 0x00000054
my_datapath.PCPlus8D = 0x00000054
my_datapath.PCSrcW = 0
my_datapath.PC_NEXT = 0x00000054
my_datapath.PC_NEXT_NEXT = 0x00000054
my_datapath.RA1D = 1111
my_datapath.RA1E = 0000
my_datapath.RA2D = 1110
my_datapath.RA2E = 0000
my_datapath.RD1 = 0x00000054
```

```

my_datapath.RD1E      = 0x00000000
my_datapath.RD2      = 0x00000040
my_datapath.RD2E      = 0x00000000
my_datapath.REG_FILE_DATA = 0x00000330
my_datapath.ROT_VALUE   = 00000000
my_datapath.Rd        = 1111
my_datapath.ReadDataM  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.ReadDataW  = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
my_datapath.RegSrcD    = 00
my_datapath.RegWriteW   = 1
my_datapath.ResultW    = 0x00000330
my_datapath.Rm        = 1110
my_datapath.Rn        = 1111
my_datapath.SHIFTED_DATA = 0x00000330
my_datapath.SHIFT_CONTROL = 00
my_datapath.SHIFT_DATA   = 0x00000330
my_datapath.SHIFT_SHAMT   = 00000
my_datapath.SrcAE     = 0x00000330
my_datapath.SrcB      = 0x00000330
my_datapath.SrcBE     = 0x00000330
my_datapath.SrcBEData  = 0x00000330
my_datapath.StallID    = 0
my_datapath.StallIF    = 0
my_datapath.WA3E      = 0000
my_datapath.WA3M      = 0000
my_datapath.WA3W      = 0000
my_datapath.WriteDataM = 0x00000000
my_datapath.Write_Z_ENABLE = 1
my_datapath.Z_FLAG     = 0
my_datapath.Z_OUT      = 0
my_datapath.clk        = 1
my_datapath.reset      = 0
295000.00ns DEBUG Performance Model ***** DUT Controller Signals *****
my_controller.ALUControlD = 1101
my_controller.ALUControlE = 0000
my_controller.ALUSrcD    = 0
my_controller.ALUSrcE    = 0
my_controller.BControl   = 0
my_controller.BranchD   = 1

```

```

my_controller.BranchE      = 0
my_controller.BranchTakenE = 0
my_controller.Cond        = 1110
my_controller.CondE       = 0000
my_controller.CondEx     = 1
my_controller.FlagWriteD  = 00
my_controller.FlagWriteE  = 01
my_controller.FuncControl = 0
my_controller.Funct       = 010010
my_controller.ImmSrcD    = 00
my_controller.MemWriteD   = 0
my_controller.MemWriteE   = 0
my_controller.MemWriteM   = 0
my_controller.MemtoRegD   = 0
my_controller.MemtoRegE   = 0
my_controller.MemtoRegM   = 0
my_controller.MemtoRegW   = 0
my_controller.Op          = 00
my_controller.PCSrcD     = 0
my_controller.PCSrcE     = 0
my_controller.PCSrcM     = 0
my_controller.PCSrcW     = 0
my_controller.RegSrcD    = 00
my_controller.RegWriteD   = 0
my_controller.RegWriteE   = 1
my_controller.RegWriteM   = 1
my_controller.RegWriteW   = 1
my_controller.Write_Z_ENABLE = 1
my_controller.Z_FLAG     = 0
my_controller.clk         = 1
my_controller.reset       = 0

```

***** Performance Model / DUT Data *****

296000.00ns DEBUG Performance Model	PC:0x-1	PC:0x54
296000.00ns DEBUG Performance Model	Register:0:	0x330 0x330
296000.00ns DEBUG Performance Model	Register:1:	0x13 0x13
296000.00ns DEBUG Performance Model	Register:2:	0x26 0x26
296000.00ns DEBUG Performance Model	Register:3:	0x2 0x2
296000.00ns DEBUG Performance Model	Register:4:	0x4c 0x4c
296000.00ns DEBUG Performance Model	Register:5:	0xa 0xa

```

296000.00ns DEBUG Performance Model      Register:6: 0x80000002 0x80000002
296000.00ns DEBUG Performance Model      Register:7: 0xffffffff8 0xffffffff8
296000.00ns DEBUG Performance Model      Register:8: 0x26    0x26
296000.00ns DEBUG Performance Model      Register:9: 0x0     0x0
296000.00ns DEBUG Performance Model      Register:10: 0x0   0x0
296000.00ns DEBUG Performance Model      Register:11: 0x0   0x0
296000.00ns DEBUG Performance Model      Register:12: 0x0   0x0
296000.00ns DEBUG Performance Model      Register:13: 0x0   0x0
296000.00ns DEBUG Performance Model      Register:14: 0x40  0x40
296000.00ns DEBUG Performance Model      Register:15: Not checked 0x58
297000.00ns INFO cocotb.regression      Pipeline_test ←[32mpassed←[49m←[39m
297000.00ns INFO cocotb.regression
*****
** TEST           STATUS SIM TIME (ns) REAL TIME (s) RATIO (ns/s) **
*****
** Pipeline_Test.Pipeline_test ←[32m PASS ←[49m←[39m 297000.00      0.34  867714.50 **
*****
** TESTS=1 PASS=1 FAIL=0 SKIP=0      297000.00      0.50  597465.16 **
*****

```

make[1]: Leaving directory '/c/Users/alper/Desktop/EE/EE5-2/EE446/Prelim/Exp4/Pipeline_ARM/Test'

(base) PS C:\Users\alper\Desktop\EE\EE5-2\EE446\Prelim\Exp4\Pipeline_ARM\Test>