Controller

R-Type:

opc = 000000

opc	Rs	Rt	Rd	shamnt	func

signals:

RegWrite = 1

toReg = 1

RegDst = 1

toPC_1 = 1

the others = 0

add:

func = 100000

ALUop = 010

sub:

func = 010000

ALUop = 110

and:

func = 001000

ALUop = 000

or:

func = 000100

ALUop = 001

slt:

func = 000010

ALUop = 111

J:

opc = 000001

opc	adr

signals:

toPC_2 = 1

the others = 0

Jr:

opc = 000011

opc	Rs	X

signals:

all signals = 0

Jal:

opc = 000111

opc	adr

signals:

RegWrite = 1

Jal = 1

toPC_2 = 1

the others = 0

addi:

opc = 001111

opc	Rs	Rd	number

signals:

ALUsrc = 1

RegWrite = 1

toReg = 1

toPC_1 = 1

ALUop = 010

the others = 0

slti:

opc = 111111

opc	Rs	Rd	number

signals:

ALUsrc = 1

RegWrite = 1

toReg = 1

toPC_1 = 1

ALUop = 111

the others = 0

beq:

opc = 011111

opc	Rs	Rt	L

signals:

PCsrc = zero Flag

toPC_1 = 1

ALUop = 110

the others = 0

sw:

opc = 111110

opc	Rs	Rt	adr

signals:

ALUsrc = 1

MemWrite = 1

toPC_1 = 1

ALUop = 010

the others = 0

lw:

opc = 111100

opc	Rs	Rd	adr

signals:

MemtoReg = 1

MemRead = 1

ALUsrc = 1

RegWrite = 1

toReg = 1

toPC_1 = 1

ALUop = 010

the others = 0

Table

	MemWrite	MemRead	MemtoReg	PCsrc	ALUsrc	RegWrite	toReg	Jal	RegDst	toPC_1	toPC_2	ALUop
add	0	0	0	Zero Flag	0	1	1	0	1	1	0	010
sub	0	0	0	0	0	1	1	0	1	1	0	110
and	0	0	0	0	0	1	1	0	1	1	0	000
or	0	0	0	0	0	1	1	0	1	1	0	001
slt	0	0	0	0	0	1	1	0	1	1	0	111
J	0	0	X	0	X	0	0	X	X	X	1	X
Jr	0	0	X	0	X	0	X	X	X	0	0	X
Jal	0	0	X	0	X	1	X	1	X	X	1	X
addi	0	0	0	0	1	1	1	0	0	1	0	010
slti	0	0	0	0	1	1	1	0	0	1	0	111
beq	0	0	X	0	0	0	X	0	X	1	0	110
sw	1	0	X	0	1	0	X	X	X	1	0	010
lw	0	1	1	0	1	1	1	0	0	1	0	010