	PC Main ctrl ALU ctrl											Main ctrl										
Instruction	opcode	PC src	Ext op	Selection1	Src1	RegWrite	Zero	Carry	Overflow	positive	negative	ALU op	Selection2	Memory data	Wb data	Memory read	Memory write	OPERAND2	Mode	Data selector		
AND	0000	0	X	0	1	1	X	X	X	X	X	AND	1	X	0	0	0	1	X	X		
ADD	0001	0	X	0	1	1	X	X	X	X	X	ADD	1	X	0	0	0	1	X	X		
SUB	0010	0	X	0	1	1	X	X	X	X	X	SUB	1	X	0	0	0	1	X	X		
ADDI	0011	0	1	X	1	1	X	X	X	X	X	ADD	1	X	0	0	0	0	X	X		
ANDI	0100	0	0	X	1	1	X	X	X	X	X	AND	1	X	0	0	0	0	X	X		
LW	0101	0	1	X	1	1	X	X	X	X	X	ADD	1	X	1	1	0	0	X	0		
LBU	0110	0	1	X	1	1	X	X	X	X	X	ADD	1	X	1	1	0	0	0	1		
LBS	0110	0	1	X	1	1	X	X	X	X	X	ADD	1	X	1	1	0	0	1	1		
SW	0111	0	1	X	1	0	X	X	X	X	X	ADD	1	1	X	0	1	0	X	X		
BGT	1000	1	1	1	1	0	0	X	0	1	0	SUB	X	X	X	0	0	X	X	X		
BGTZ	1000	1	1	1	0	0	0	X	X	1	0	SUB	X	X	X	0	0	X	X	X		
BLT	1001	1	1	1	1	0	X	X	0	0	1	SUB	X	X	X	0	0	X	X	X		
BLTZ	1001	1	1	1	0	0	X	X	X	0	1	SUB	X	X	X	0	0	X	X	X		
BEQ	1010	1	1	1	1	0	1	X	X	X	X	SUB	X	X	X	0	0	X	X	X		
BEQZ	1010	1	1	1	0	0	1	X	X	X	X	SUB	X	X	X	0	0	X	X	X		
BNE	1011	1	1	1	1	0	0	X	X	X	X	SUB	X	X	X	0	0	X	X	X		
BNEZ	1011	1	1	1	0	0	0	X	X	X	X	SUB	X	X	X	0	0	X	X	X		
JUMP	1100	2	X	X	X	0	X	X	X	X	X	X	X	X	X	0	0	X	X	X		
CALL	1101	2	X	X	X	0	X	X	X	X	X	X	X	X	X	0	0	X	X	X		
RET	1110	3	X	2	X	0	X	X	X	X	X	X	X	X	X	0	0	X	X	X		
SV	1111	0	X	X	1	0	X	X	X	X	X	X	0	0	X	0	1	X	X	X		

Sara Awayssa-1211642

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Signal	PC src	Ext op	Selectio	Src1	RegWrit	Zero	Carry	Overflo	Positive	Negativ	ALU op	Selection	Memory	Wb	Memor	Memor	Operand	Mode	Data
_			n 1		e		_	W		e	_	2	data	data	y read	y write	2		selector
Descriptio	Used	Used to	Used to	Used to	A flag if	A flag	A flag	A flag	A flag	A flag	Used to	Used to	Used to	Used to	Used to	Used to	Used to	Used to	Used to
n	to	select if	choose	select	there is a	resulte	resulted	resulted	resulted	resulted	determin	select the	select the	select	indicate	indicate	choose	determin	select
	choose	the	the	the first	required	d from	from	from	from	from	e the	required	data in to	the	if the	if the	the	e the	the data
	the	required	second	operan	data to	ALU	ALU to	ALU to	ALU to	ALU to	used	data	be written	require	data	data	second	type of	out in
	suitabl	extension	operand	d	write	to	indicate	indicate	indicate	indicate	ALU	memory	to the data	d data	memor	memor	operand	extensio	load
	e value	is zero or	which	which	back it	indicat	if the	if there	if the	if the	unit.	address.	memory is	to be	y will	y will	which	n to the	operatio
	of next	signed	will	enters	to the	e if the	result	is an	result is	result is			store	written	be read.	be	enters	loaded	n (word
	PC.	extension	appear	the	register	result	contain	overflow	positive	negative			instructions	back to	(Load)	written.	the	byte. (0	or
			at the	ALU.	file.	is 0.	s a	•		•				the		(store)	ALU.	or sign)	extended
			2nd read				carry.							register					byte)
			bus.											file.					

Signal	Ext op	Selection	Src1	RegWrite	Zero	Carry	Overflow	Positive	Negative	ALU op	Selection2	Memory	Wb	Memory	Memory	Operand2	Mode	Data
		1										data	data	read	write			selector
Boolean	~ANDI.		Used to	A flag if	A flag	A flag	A flag	A flag	A flag	Used to	Used to	Used to	Used to	Used to	Used to	Used to	Used to	Used to
equation			select	there is a	resulted	resulted	resulted	resulted	resulted	determine	select the	select the	select	indicate	indicate	choose	determine	select the
			the first	required	from	from	from	from	from	the used	required	data in to be	the	if the	if the	the	the type	data out
			operand	data to	ALU to	ALU to	ALU to	ALU to	ALU to	ALU	data	written to	required	data	data	second	of	in load
			which	write	indicate	indicate	indicate	indicate	indicate	unit.	memory	the data	data to	memory	memory	operand	extension	operation
			enters	back it to	if the	if the	if there is	if the	if the		address.	memory is	be	will be	will be	which	to the	(word or
			the	the	result is	result	an	result is	result is			store	written	read.	written.	enters the	loaded	extended
			ALU.	register	0.	contains	overflow.	positive.	negative.			instructions.	back to	(Load)	(store)	ALU.	byte. (0	byte)
				file.		a carry.							the				or sign)	
													register					
													file.					