

ISA

Team Name	Microarchitecture	Instruction Memory and Data Memory Size	Total Number of Registers	Instruction Format
caché	Harvard architecture	1024 x 32-bits	32 Registers	Instruction Set 2

Byte Addressing , PC +4

We have 14 instructions.

We have 4 types (R , I , J ,S)

R TYPE	1 bit	16 bits	5 bits	5 bits	5 bits
	FLAG	Opcode	rs1	rs2	rd
I TYPE	1 bit	16 bits	5 bits	5 bits	5 bits
	FLAG	Immediate	rs1	rs2	FUNCT
J type	1 bit	26 bit			5 bits
	FLAG	address			FUNCT
S type	1 bit	16 bits	5 bits	5 bits	5 bits
	FLAG	Opcode	rs1	rs2	SHIFT AMOUNT

Inst	OP	FUNCT	TYPE	FLAG
ADD	0		R	0
SUB	1		R	0
MULT	10		R	0
OR	11		R	0
SLTU	100		R	0
LW		0 I		1
SW		1 I		1
ADDI		10 I		1
ANDI		11 I		1
BEQ		100 I		1
BLT		101 I		1
J		110 J		1
SRL		111 S		1
SLL		1000 S		1

R TYPE

add rs1,rs2,rd -> rs1=rs2+rd

sub rs1,rs2,rd -> rs1=rs2-rd

mult rs1,rs2,rd -> rs1=rs2*rd

or rs1,rs2,rd -> rs1=rs2 | rd

sltu rs1,rs2,rd -> if(rs2 < rd) rs1 =1 else 0

I TYPE

lw rs1,(imm)rs2 -> rs1 =MEM[imm+rs2]

sw rs1,(imm)rs2 -> MEM[imm+rs2]=rs1

addi rs1,rs2,imm -> rs1 = rs2+imm

andi rs1,rs2,imm = rs1=rs2 & imm

beq rs1,rs2,L -> IF (Rs1==rs2) -> L ELSE PC+4 TARGET

ADDRESS =(PC+4)+4*A

blt rs1,rs2,L -> IF(Rs1 < rs2) ->L Else PC++4

J type

J L => Jump To Label L TARGET ADDRESS = {pc [31:28],4*A}

S Type

Srl rs1,rs2,a -> rs1 = rs2>>a

Sll rs1,rs2,a -> rs1 = rs2 << a

Inst	Flag	OP	Funct	ALUOP	Reg write	Jump	Branch	Alusrc	Mem toReg	Mem write	Mem read
ADD	0	0		000	1	0	0	0	0	0	0
SUB	0	1		001	1	0	0	0	0	0	0
MULT	0	10		010	1	0	0	0	0	0	0
OR	0	11		011	1	0	0	0	0	0	0
SLTU	0	100		100	1	0	0	0	0	0	0
Lw	1		0	000	1	0	0	1	1	0	1
Sw	1		1	000	0	0	0	1	X	0	0
ADDI	1		10	000	1	0	0	1	0	0	0
Andi	1		11	101	1	0	0	1	0	0	0
J	1		110	XXX	0	1	0	X	X	X	X
Beq	1		100	001	0	0	1	0	X	0	0
blt	1		101	100	0	0	1	0	X	0	0
Srl	1		111	110	1	0	0	0	0	0	0
sll	1		1000	111	1	0	0	0	0	0	0

Reg Number	Reg name	USE
0	\$0	ZERO
1	\$r1	GENERAL
2	\$r2	GENERAL
3	\$r3	GENERAL
4	\$r4	GENERAL
5	\$r5	GENERAL
6	\$r6	GENERAL
7	\$r7	GENERAL
8	\$r8	GENERAL
9	\$r9	GENERAL
10	\$r10	GENERAL
11	\$r11	GENERAL
12	\$r12	GENERAL
13	\$r13	GENERAL
14	\$r14	GENERAL
15	\$r15	GENERAL
16	\$r16	GENERAL
17	\$r17	GENERAL
18	\$r18	GENERAL
19	\$r19	GENERAL
20	\$r20	GENERAL
21	\$r21	GENERAL
22	\$r22	GENERAL
23	\$r23	GENERAL
24	\$r24	GENERAL
25	\$r25	GENERAL
26	\$r26	GENERAL
27	\$r27	GENERAL
28	\$r28	GENERAL
29	\$r29	GENERAL
30	\$r30	GENERAL
31	\$r31	GENERAL