

31	25	24	20	19	15	14	12	11	7	6	0	
funct7		rs2		rs1		funct3		rd		opcode		R-type
imm[11:0]				rs1		funct3		rd		opcode		I-type
imm[11:5]		rs2		rs1		funct3		imm[4:0]		opcode		S-type
imm[12 10:5]		rs2		rs1		funct3		imm[4:1 11]		opcode		B-type
imm[31:12]								rd		opcode		U-type
imm[20 10:1 11 19:12]								rd		opcode		J-type

imm[31:12]				rd		0110111		LUI
imm[31:12]				rd		0010111		AUIPC
imm[20 10:1 11 19:12]				rd		1101111		JAL
imm[11:0]			rs1	000	rd		1100111	JALR
imm[12 10:5]	rs2	rs1	000	imm[4:1 11]		1100011		BEQ
imm[12 10:5]	rs2	rs1	001	imm[4:1 11]		1100011		BNE
imm[12 10:5]	rs2	rs1	100	imm[4:1 11]		1100011		BLT
imm[12 10:5]	rs2	rs1	101	imm[4:1 11]		1100011		BGE
imm[12 10:5]	rs2	rs1	110	imm[4:1 11]		1100011		BLTU
imm[12 10:5]	rs2	rs1	111	imm[4:1 11]		1100011		BGEU
imm[11:0]			rs1	000	rd		0000011	LB
imm[11:0]			rs1	001	rd		0000011	LH
imm[11:0]			rs1	010	rd		0000011	LW
imm[11:0]			rs1	100	rd		0000011	LBU
imm[11:0]			rs1	101	rd		0000011	LHU
imm[11:5]	rs2	rs1	000	imm[4:0]		0100011		SB
imm[11:5]	rs2	rs1	001	imm[4:0]		0100011		SH
imm[11:5]	rs2	rs1	010	imm[4:0]		0100011		SW
imm[11:0]			rs1	000	rd		0010011	ADDI
imm[11:0]			rs1	010	rd		0010011	SLTI
imm[11:0]			rs1	011	rd		0010011	SLTIU
imm[11:0]			rs1	100	rd		0010011	XORI
imm[11:0]			rs1	110	rd		0010011	ORI
imm[11:0]			rs1	111	rd		0010011	ANDI
0000000	shamt	rs1	001	rd		0010011		SLLI
0000000	shamt	rs1	101	rd		0010011		SRLI
0100000	shamt	rs1	101	rd		0010011		SRAI
0000000	rs2	rs1	000	rd		0110011		ADD
0100000	rs2	rs1	000	rd		0110011		SUB
0000000	rs2	rs1	001	rd		0110011		SLL
0000000	rs2	rs1	010	rd		0110011		SLT
0000000	rs2	rs1	011	rd		0110011		SLTU
0000000	rs2	rs1	100	rd		0110011		XOR
0000000	rs2	rs1	101	rd		0110011		SRL

0100000		rs2		rs1	101	rd	0110011	SRA
0000000		rs2		rs1	110	rd	0110011	OR
0000000		rs2		rs1	111	rd	0110011	AND
0000	pred	succ	00000	000	00000	0001111	FENCE	
0000	0000	0000	00000	001	00000	0001111	FENCE.I	
000000000000			00000	000	00000	1110011	ECALL	
0000000000001			00000	000	00000	1110011	EBREAK	
001100000010			00000	000	00000	1110011	MRET	
csr			rs1	001	rd	1110011	CSRRW	
csr			rs1	010	rd	1110011	CSRRS	
csr			rs1	011	rd	1110011	CSRRC	
csr			zimm	101	rd	1110011	CSRRWI	
csr			zimm	110	rd	1110011	CSRRSI	
csr			zimm	111	rd	1110011	CSRRCI	

0000001	rs2	rs1	000	rd	0110011	MUL
0000001	rs2	rs1	001	rd	0110011	MULH
0000001	rs2	rs1	010	rd	0110011	MULSU
0000001	rs2	rs1	011	rd	0110011	MULU
0000001	rs2	rs1	100	rd	0110011	DIV
0000001	rs2	rs1	101	rd	0110011	DIVU
0000001	rs2	rs1	110	rd	0110011	REM
0000001	rs2	rs1	111	rd	0110011	REMU

15	14	13	12	11	10	9	8	7	5	6	4	3	2	1	0	
funct4				rd/rs1					rs2					op		CR-type
funct3		imm		rd/rs1					imm					op		CI-type
funct3		imm							rs2					op		CSS-type
funct3		imm									rd'			op		CIW-type
funct3		imm				rs1'			imm		rd'			op		CL-type
funct3		imm				rd'/rs1'			imm		rs2'			op		CS-type
funct3		imm				rs1'			imm					op		CB-type
funct3		offset												op		CJ-type

010	Imm	rd/rs1		imm		10	c.lwsp
110	imm			rs2		10	c.swsp
010	imm		rs1'	imm	rd'	00	c.lw
110	imm		rd'/rs1'	imm	rs2'	00	c.sw
101	Offset					01	c.j
001	Offset					01	c.jal
100	0	rd/rs1		rs2		10	c.jr
100	1	rd/rs1		rs2		10	c.jalr
110	imm		rs'	imm		01	c.beqz
111	imm		rs'	imm		01	c.bnez
010	imm	rd/rs1		imm		01	c.li
011	imm	rd/rs1		imm		01	c.lui
000	imm	rd/rs1		imm		01	c.addi
011	imm	rd/rs1		imm		01	c.addi16sp
000	imm				rd'	00	c.addi4spn
000	imm	rd/rs1		imm		10	c.slli
100	x	00	rd'	imm		01	c.srli
100	x	01	rd'	imm		01	c.srai
100	x	10	rd'	imm		01	c.andi
100	0	rd		rs2		10	c.mv
100	1	rd		rs2		10	c.add
100	0	11	rd	11	rs2	01	c.and
100	0	11	rd	10	rs2	01	c.or
100	0	11	rd	01	rs2	01	c.xor
100	0	11	rd	00	rs2	01	c.sub
000	imm	rd/rs1		imm		01	c.nop
100	1	rd/rs1		rs2		10	c.ebreak