

RV32I Base Instruction Set

Instruction Formats

31	27	26	25	24	20	19	15	14	12	11	7	6	0		
funct7			rs2		rs1		funct3		rd		opcode			R-type	
imm[11:0]				rs2		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	

Instructions

31	27	26	25	24	20	19	15	14	12	11	7	6	0	
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]			rs2		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]			rs2		rs1		000		rd		0000011			LB
imm[11:0]			rs2		rs1		001		rd		0000011			LH
imm[11:0]			rs2		rs1		010		rd		0000011			LW
imm[11:0]			rs2		rs1		100		rd		0000011			LBU
imm[11:0]			rs2		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]			rs2		rs1		000		rd		0010011			ADDI
imm[11:0]			rs2		rs1		010		rd		0010011			SLTI
imm[11:0]			rs2		rs1		011		rd		0010011			SLTIU
imm[11:0]			rs2		rs1		100		rd		0010011			XORI
imm[11:0]			rs2		rs1		110		rd		0010011			ORI
imm[11:0]			rs2		rs1		111		rd		0010011			ANDI
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
fm	pred		succ		rs1		000		rd		0001111			FENCE
0000000			00000		00000		000		00000		1110011			ECALL
0000000			00001		00000		000		00000		1110011			EBREAK
0000000			shamt		rs1		001		rd		0010011			SLLI
0000000			shamt		rs1		101		rd		0010011			SRLI
0100000			shamt		rs1		101		rd		0010011			SRAI
1000001			10011		rs1		000		rd		0001111			FENCE.TSO
0000000			10000		00000		000		00000		0001111			PAUSE