(2.8.) (& : address of)

x30 = &A[1]

x31 = &A

A[1] = &A

x30 = A[1] = &A

f = &A + &A = 2*(&A)

(2.9.)

	opcode	rs1	rd	type
① addi x30, x10, 8 :	0010011	01010	11110	I-type
② addi x31, x10, 0 :	0010011	01010	11111	I-type
③ sd x31, 0(x30) :	0100011	11110	Stype 無 rd	S-type
④ ld x30, 0(x30) :	0000011	11110	11110	I-type
⑤ add x5, x30, x31 :	0110011	11110	00101	R-type

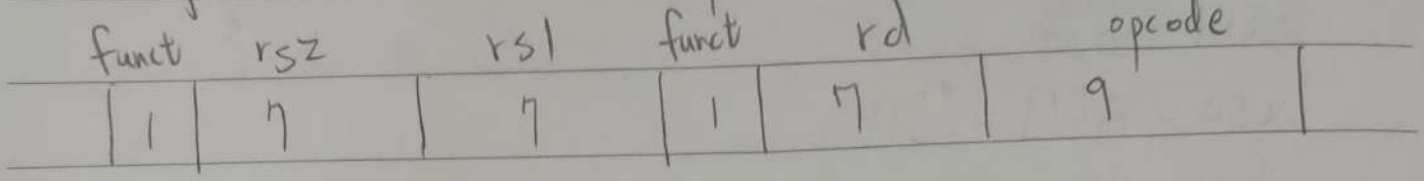
	immediate	rs2	funct3	funct7
①	000000001000		000	
②	000000000000		000	
③		11111	011	(imm[11:5]) 0000111
④	000000000000		011	
⑤		11111	000	0000000

DATE:

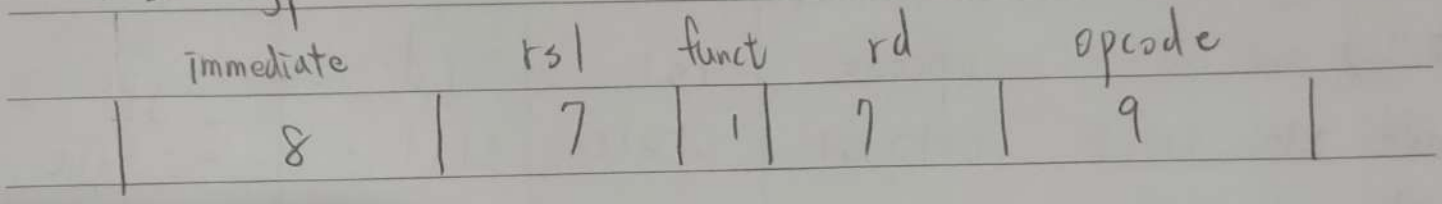
(2.16)

(1) R-type

register field 5 → 7 , opcode field 7 → 9



(2) I-type



(3)

- 因為指令集變大，可以引入更多有效率的指令來取代舊的指令，比如 swap 指令可取代原本需要 3.4 行的指令，因此 program size 會變小。

但是像是 I-type 指令，原本在 12 bits 以下可表示的 immediate 都可以一個指令結束，現在超過 8 bits 即需要更多指令來完成任務，因此 program size 也可能變大。

Report on Matrix Multiplication

1. it takes 128*128*128*8 = 16777216 cycles.
2. it needs roughly 128*128*128*2 = 4194304 loads and 128*128 = 16384 stores.
3. Using blocking technique can ensure that in a single basic block, the registers can be used as much as possible.
4. it needs roughly 128*128*128 = 2097152 loop controls.