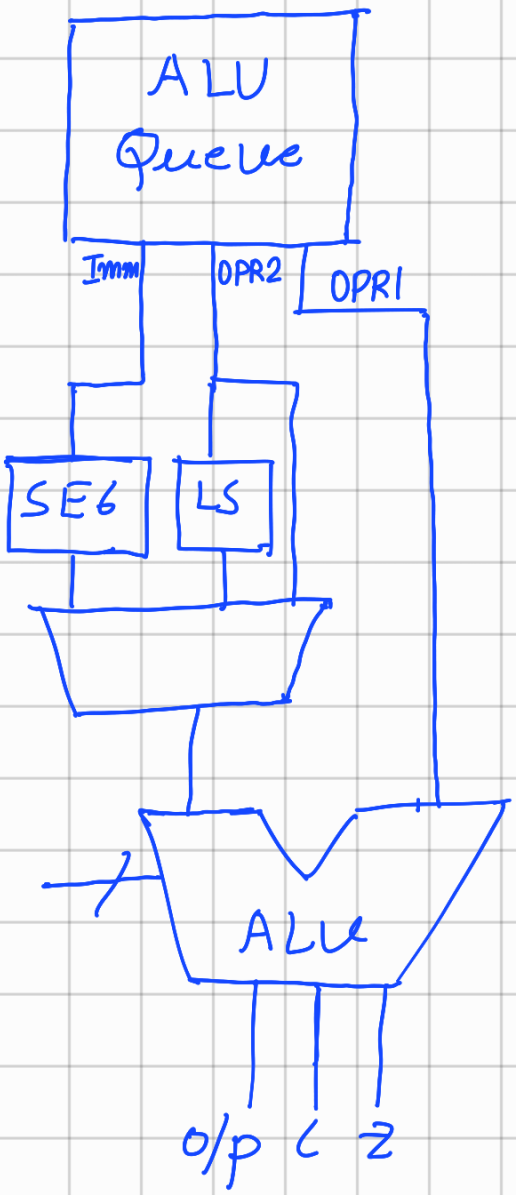
ALU EXEC



- ★ The ALU queue must send RB, RC, C, Z, mux control, ALU control
- ★ you also have controls for writing into C, Z & registers

RS

CONTROL	PC	OPR1	V1	OPR2	V2	IMM	C	V3	Z	V4	READY	ISSUED
(4)	(16)	(16)	(1)	(16)	(1)	(6)	(3)	(1)	(3)	(1)	(1)	(1)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
represents the type of instr.	Program Counter	contains the data or the sign extended RRF tag (8 bits)	valid for OPR1	same as OPR2	valid for OPR2	6-Bit Immediate value	RRF tag or SE carry	valid for carry	RRF tag or SE zero	valid for zero	V1·V2·V3·V4	current entry can be replaced by new entry if ISSUED is set

INPUTS → Control, PC, OPR1, OPR2, IMM from Decode

OUTPUTS → PC, OPR1, OPR2, IMM, C, Z to resp Exec Queues.

Do we need RR entries in RS?

ROB

PC	OUT	DEST	RR1	C	RR2	Z	RR3	FINISHED	COMPLETED
(16)	(16)	(5)	(8)	(1)	(3)	(1)	(3)	(1)	(1)
Program Counter	Output value from the Exec pipeline	Destination register	RR for DEST	carry bit after exec	RR for C	zero bit after exec	RR for Z	instr. has finished executing and OUT is updated ready to update RRF	instr. has written OUT, C, Z to respective RRs ready to update ARF

INPUTS → PC, DEST, RR1, RR2, RR3 from RS
→ OUT, C, Z, FINISHED from EXEC

OUTPUTS → RR1, OUT to RRF1
RR2, C to RRF2
RR3, Z to RRF3
} Finishing

DEST, OUT to ARF
C to carry
Z to zero
} Completion

ARF

DATA (16) (1) (1) → stored data

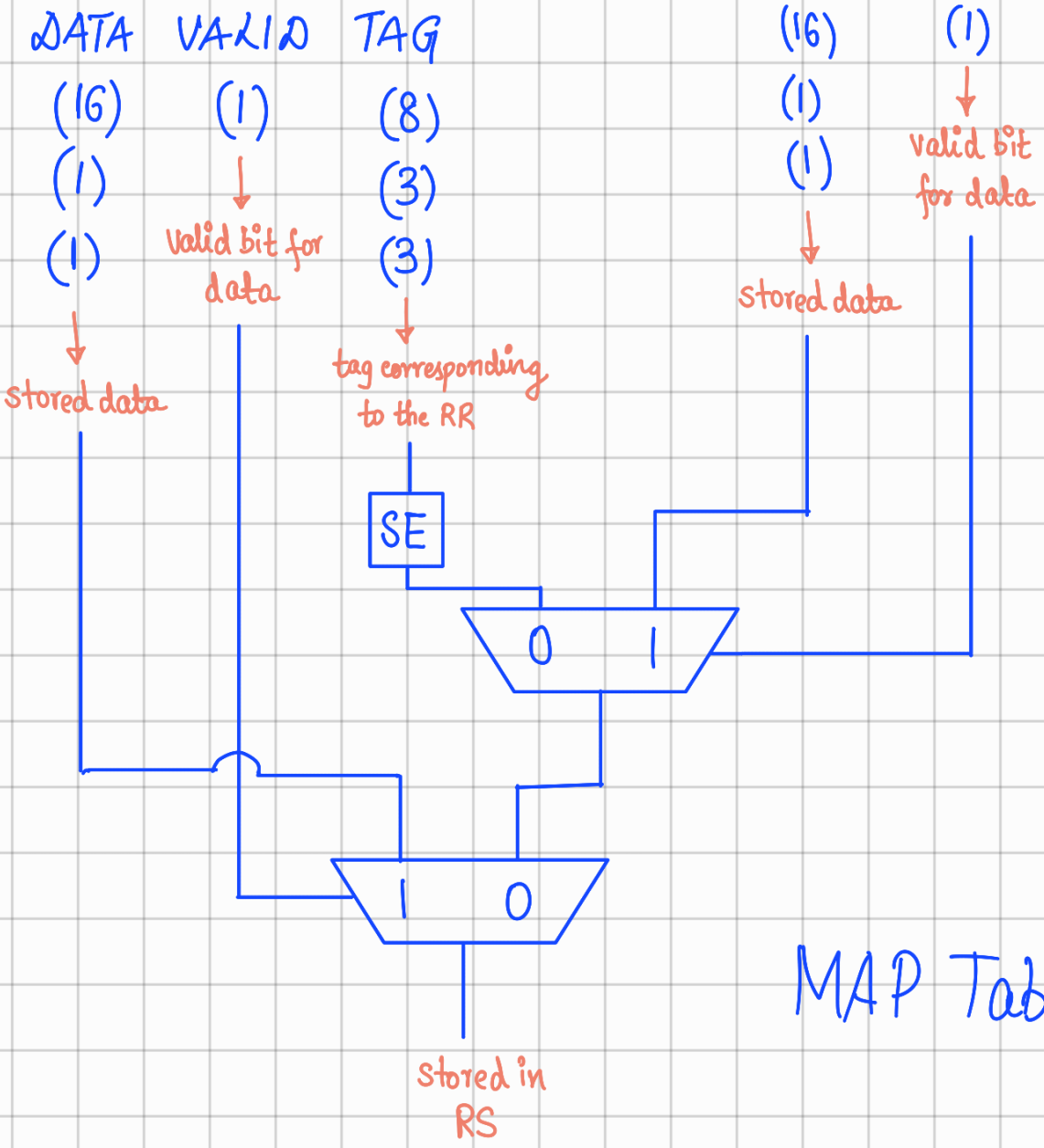
VALID (1) → valid bit for data

TAG (8) (3) (3) → tag corresponding to the RR

RRF

DATA (16) (1) (1) → stored data

VALID (1) → valid bit for data



MAP Table ?