

# MINI CPU

Group : ເໜີຍົວໄກ່ 40



# MEET OUR TEAM

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**Pattadon  
Plubladpho**



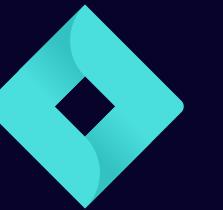
**Pawat  
Lilapantisitti**



**Nattapat  
Yansungvon**



**Chayapol  
Champoonta**



# THE PROBLEM

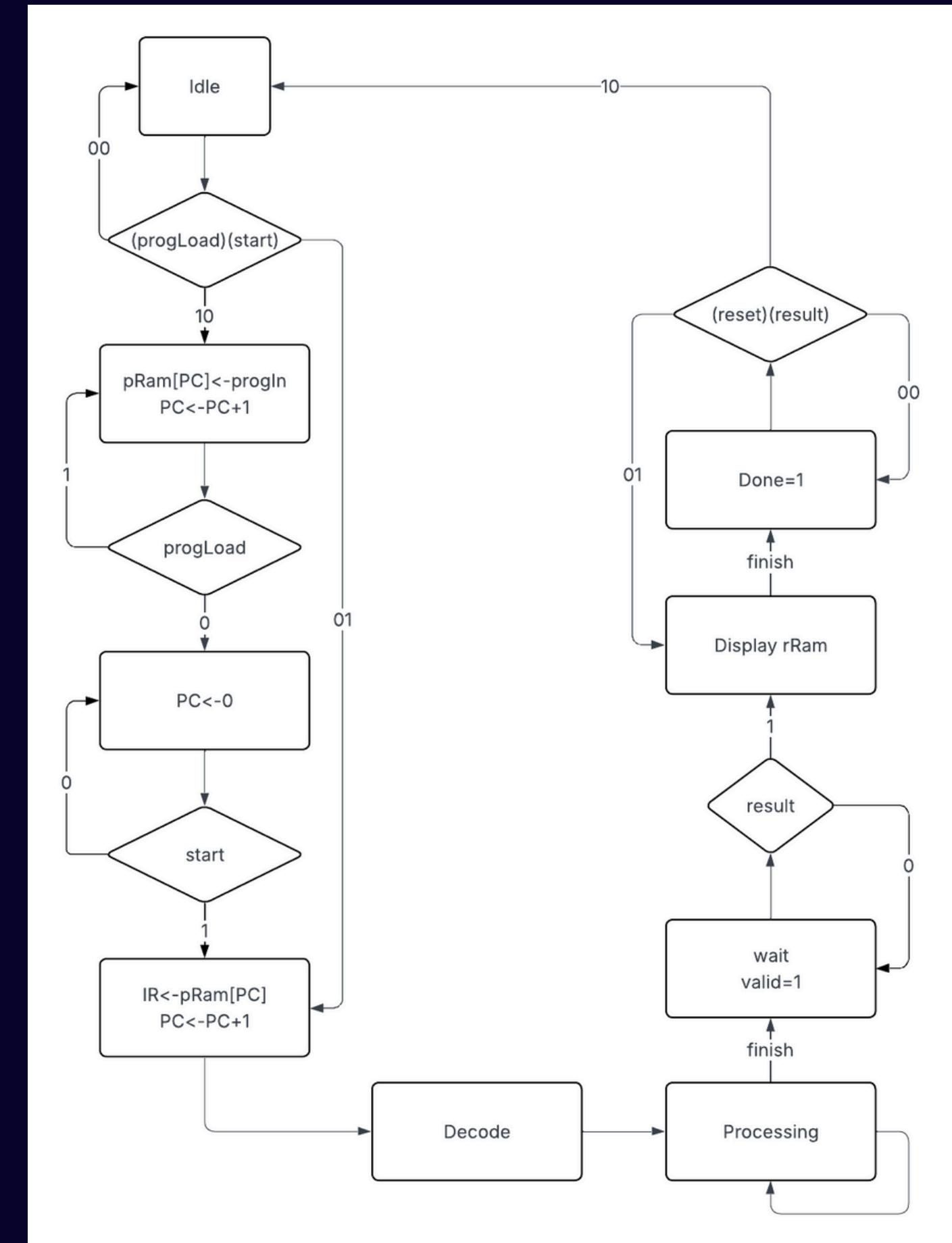
## สร้าง minicpu

- เมื่อรับคำสั่งจากprogIN(เก็บไว้ที่ pRAM) เมื่อ progLOAD เป็น 1
- เมื่อกด start เริ่มใช้ค่าใน pRAM ตาม opcode จนกว่าจะเจอคำสั่งหยุด  
แล้วค่า valid จะเป็น 1
- เมื่อได้รับคำสั่ง result จะแสดงค่าใน rRAM ออกมา และรอคำสั่ง reset ต่อไป
- มีการรับ input เพิ่มเติม คือ M, N, reset
- มีการแสดงสถานะเพิ่มเติม คือ valid, done และ output

Group : เหนี่ยวนำ 40

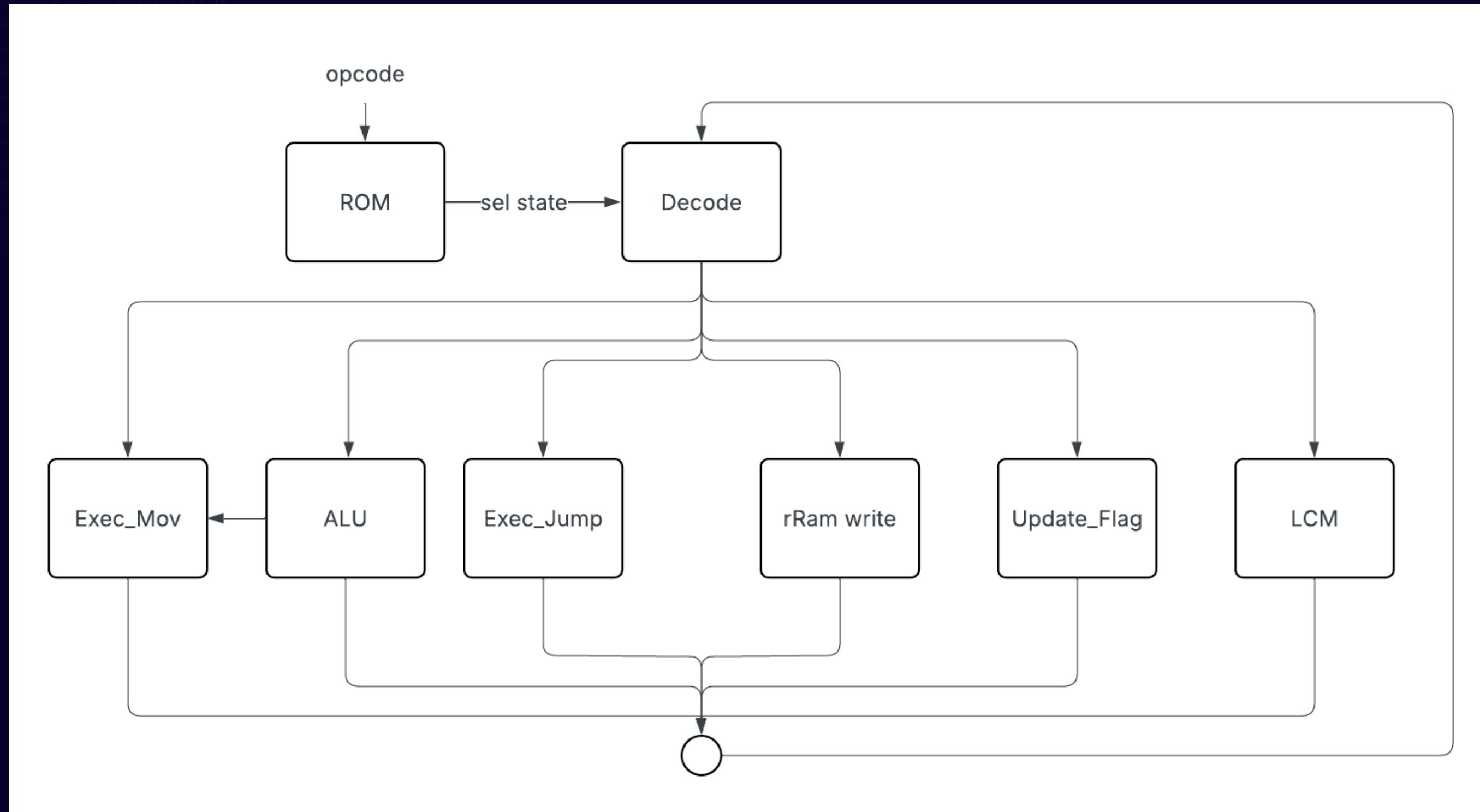


# ASM

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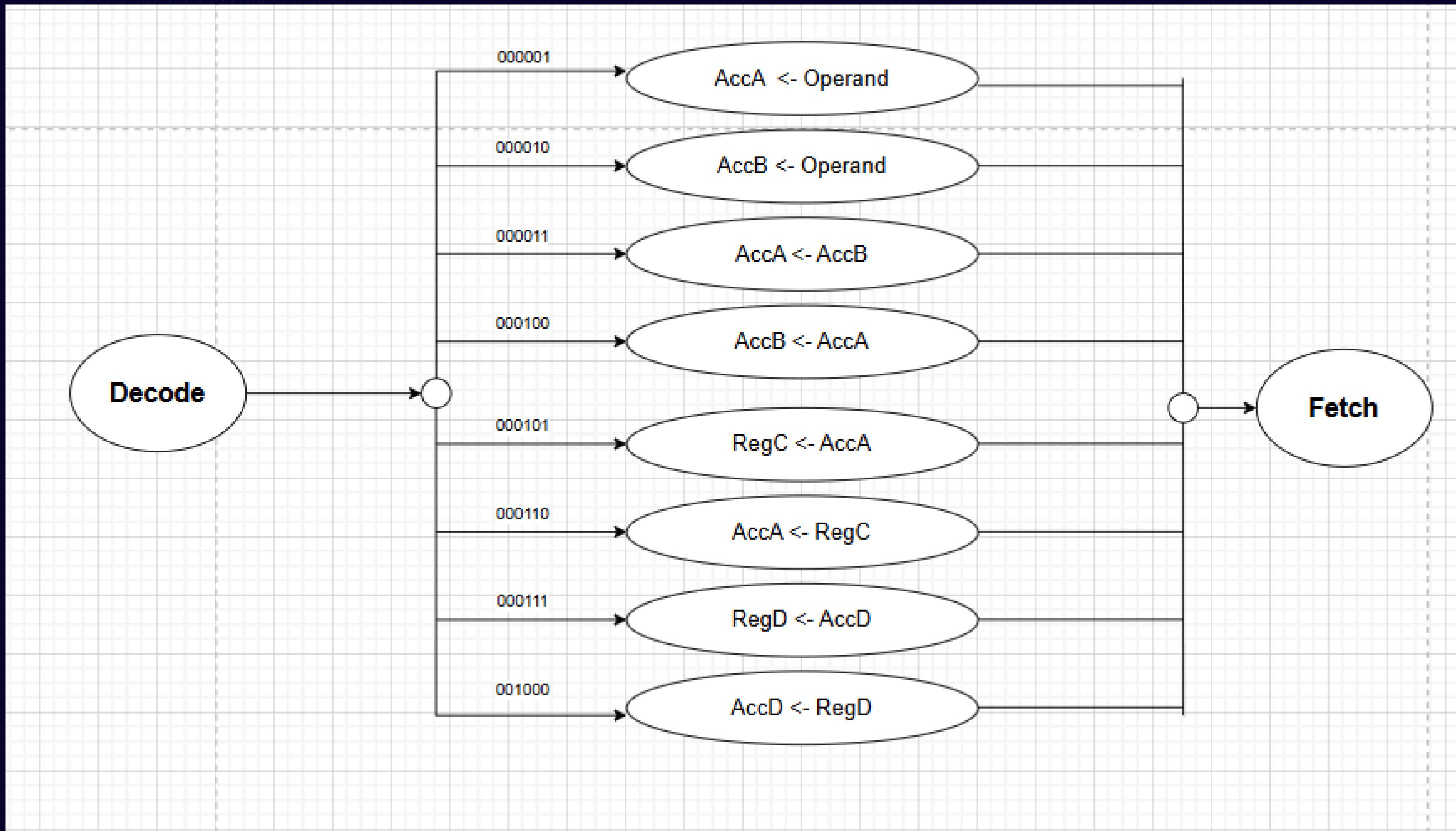


# DECODE



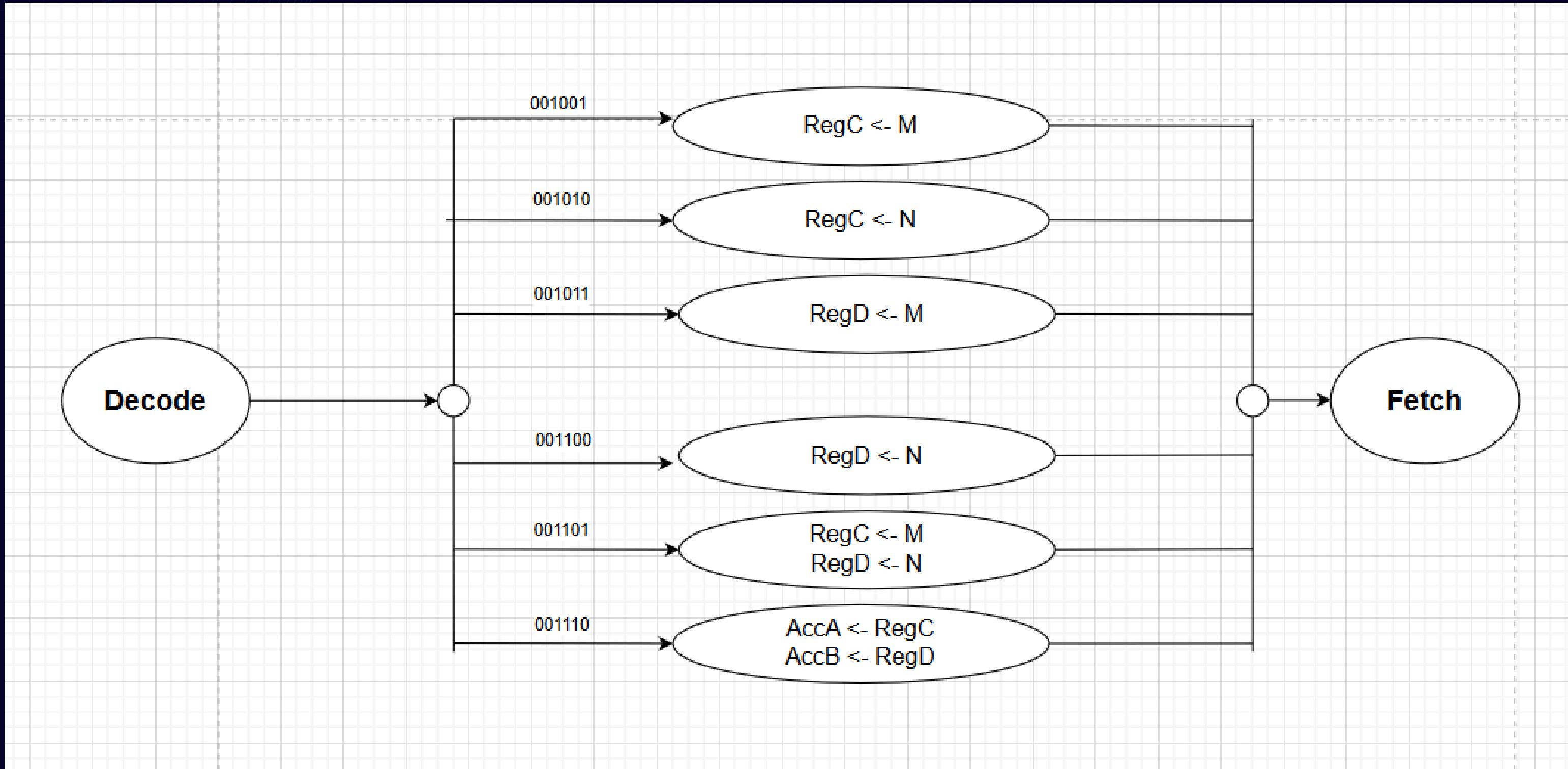


# EXEC\_MOV



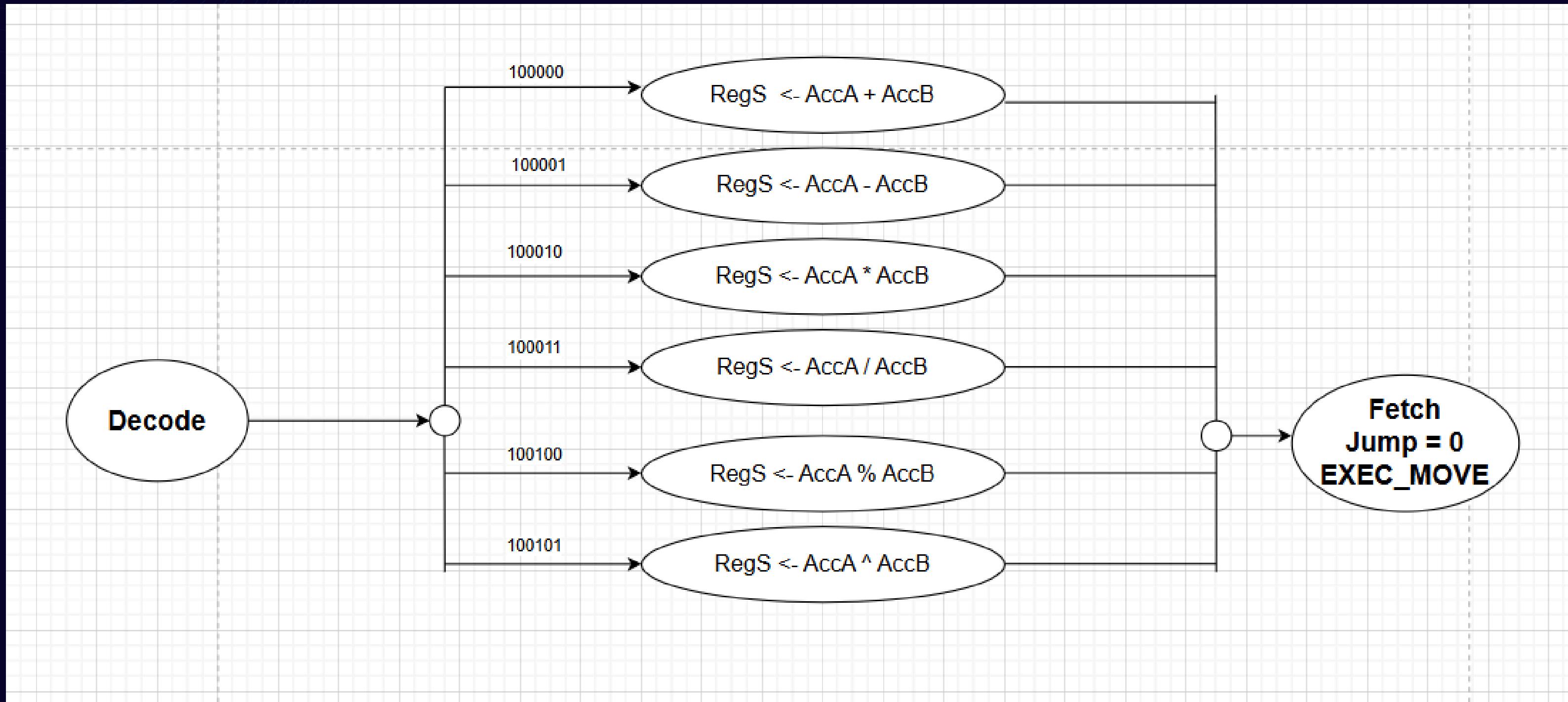


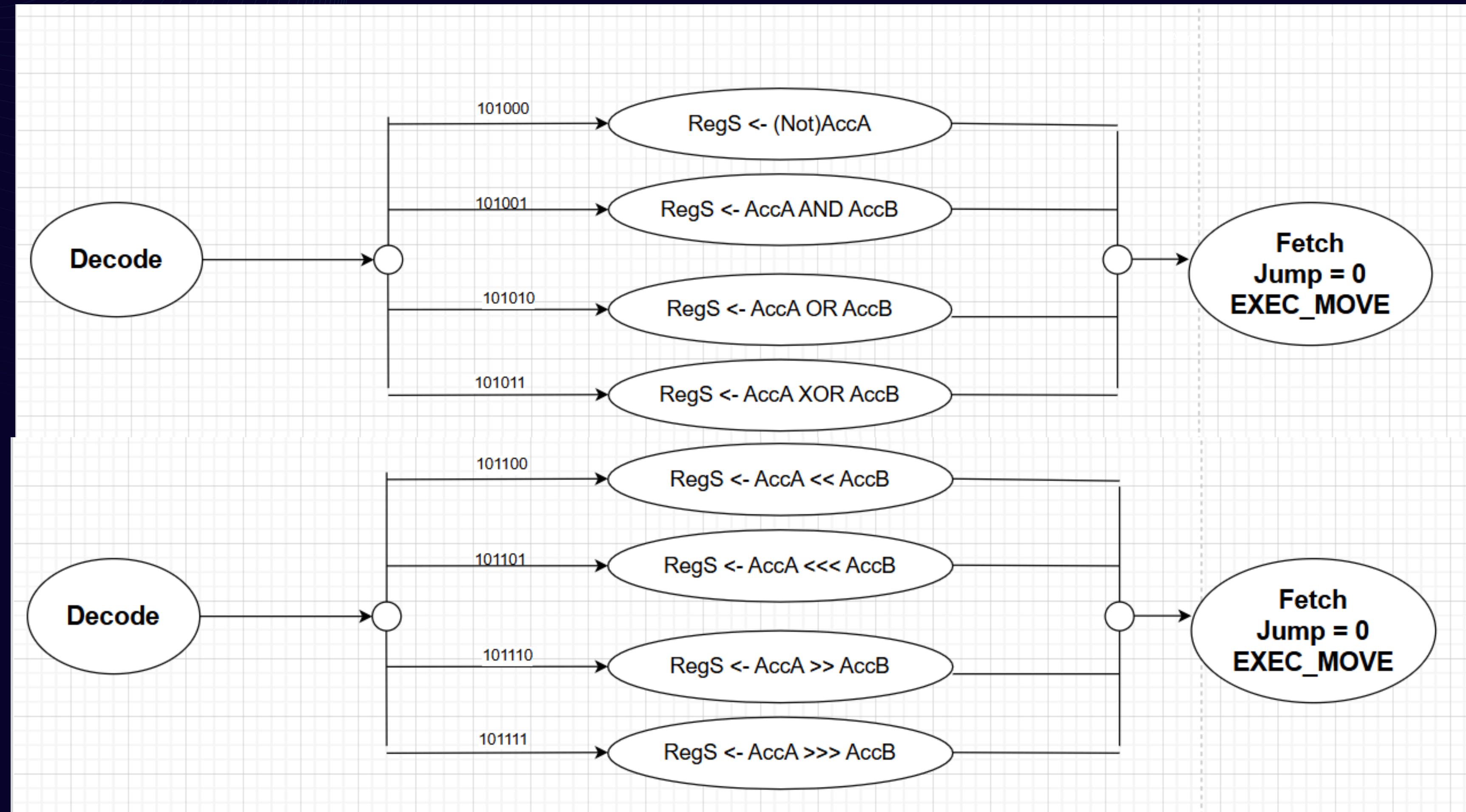
# EXEC\_MOV





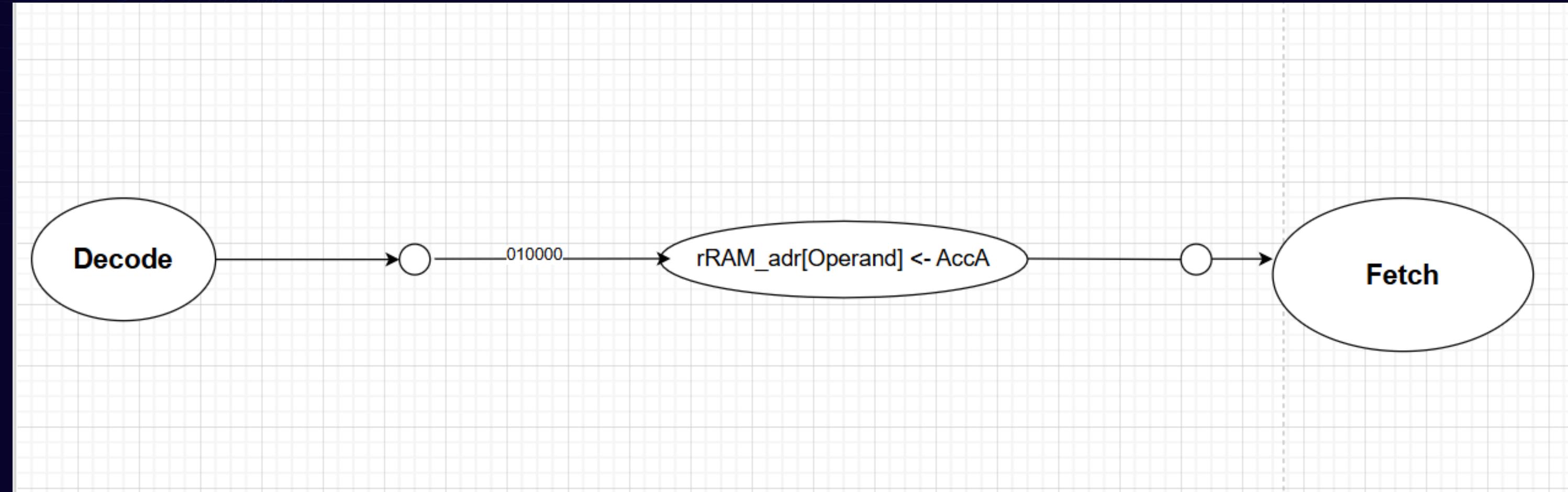
# ALU STATE





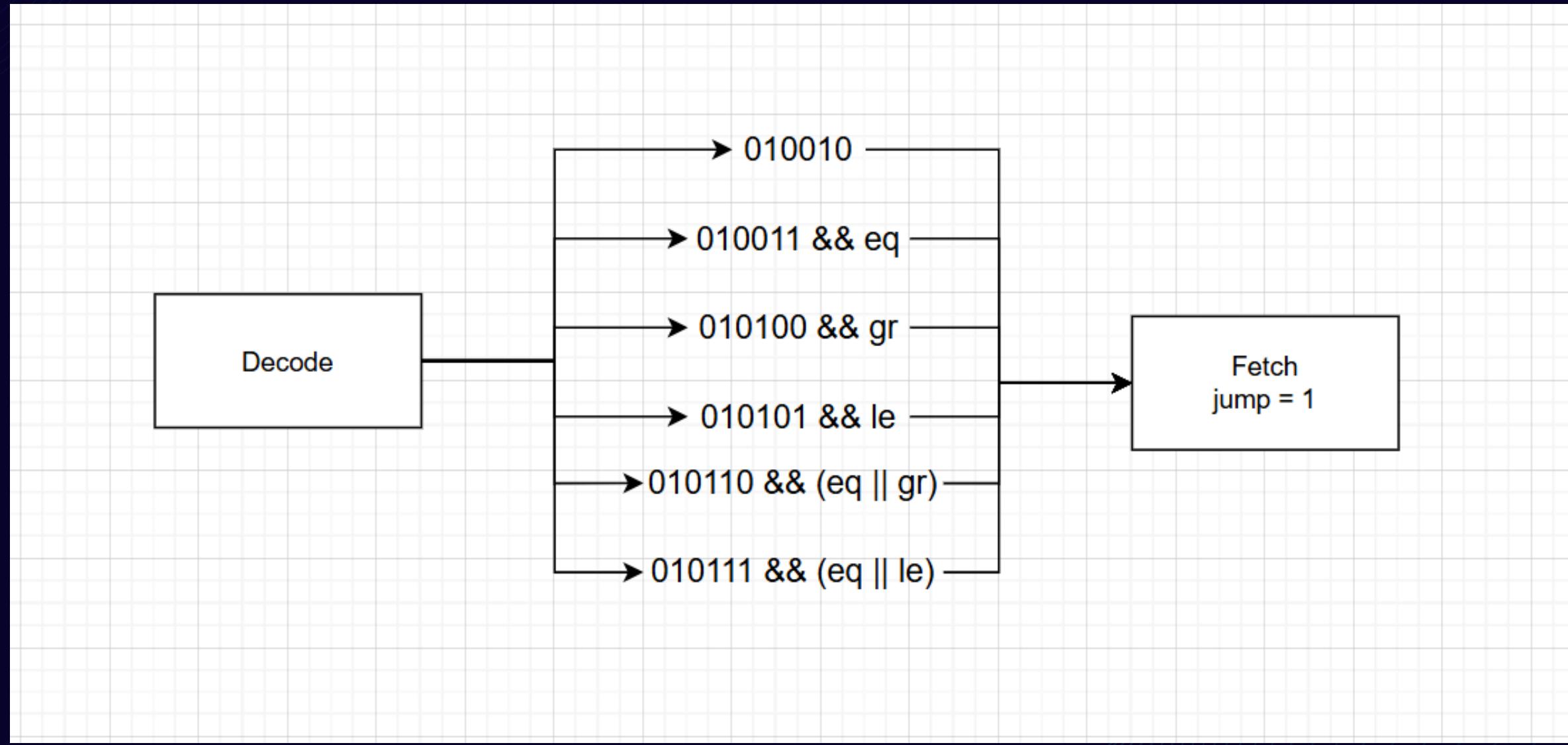


# RRAM\_WRITE



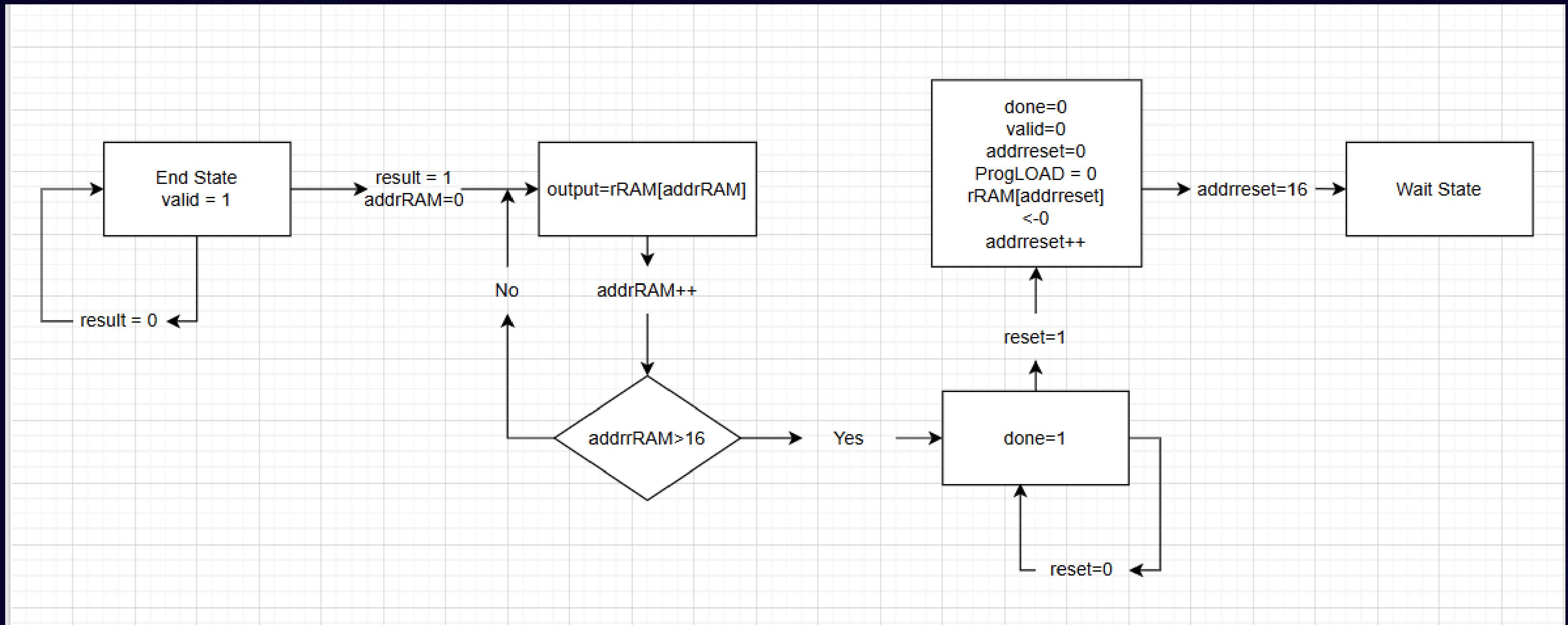


# EXEC\_JUMP





# DISPLAY RRAM





# CONTROL UNIT TABLE

| Present State | Next state |   |   |        | Condition |        |        |        | next state name |  |  |              |
|---------------|------------|---|---|--------|-----------|--------|--------|--------|-----------------|--|--|--------------|
|               | A          | B | C | D      | A<br>+    | B<br>+ | C<br>+ | D<br>+ |                 |  |  |              |
| A             | B          | C | D | A<br>+ | B<br>+    | C<br>+ | D<br>+ |        |                 |  |  |              |
| 0             | 0          | 0 | 0 | 0      | 0         | 0      | 0      | 0      | Progload = 0    |  |  | Idle         |
|               |            |   |   | 0      | 0         | 0      | 1      |        | Progload = 1    |  |  | progIn->pRam |
| 0             | 0          | 0 | 1 | 0      | 0         | 0      | 1      |        | Progload = 1    |  |  | progIn->pRam |
|               |            |   |   | 0      | 0         | 1      | 0      |        | Progload = 0    |  |  | wait start   |
| 0             | 0          | 1 | 0 | 0      | 0         | 1      | 0      |        | Start = 0       |  |  | wait start   |
|               |            |   |   | 0      | 0         | 1      | 1      |        | Start = 1       |  |  | Fetch        |

# ◆ CONTROL UNIT TABLE

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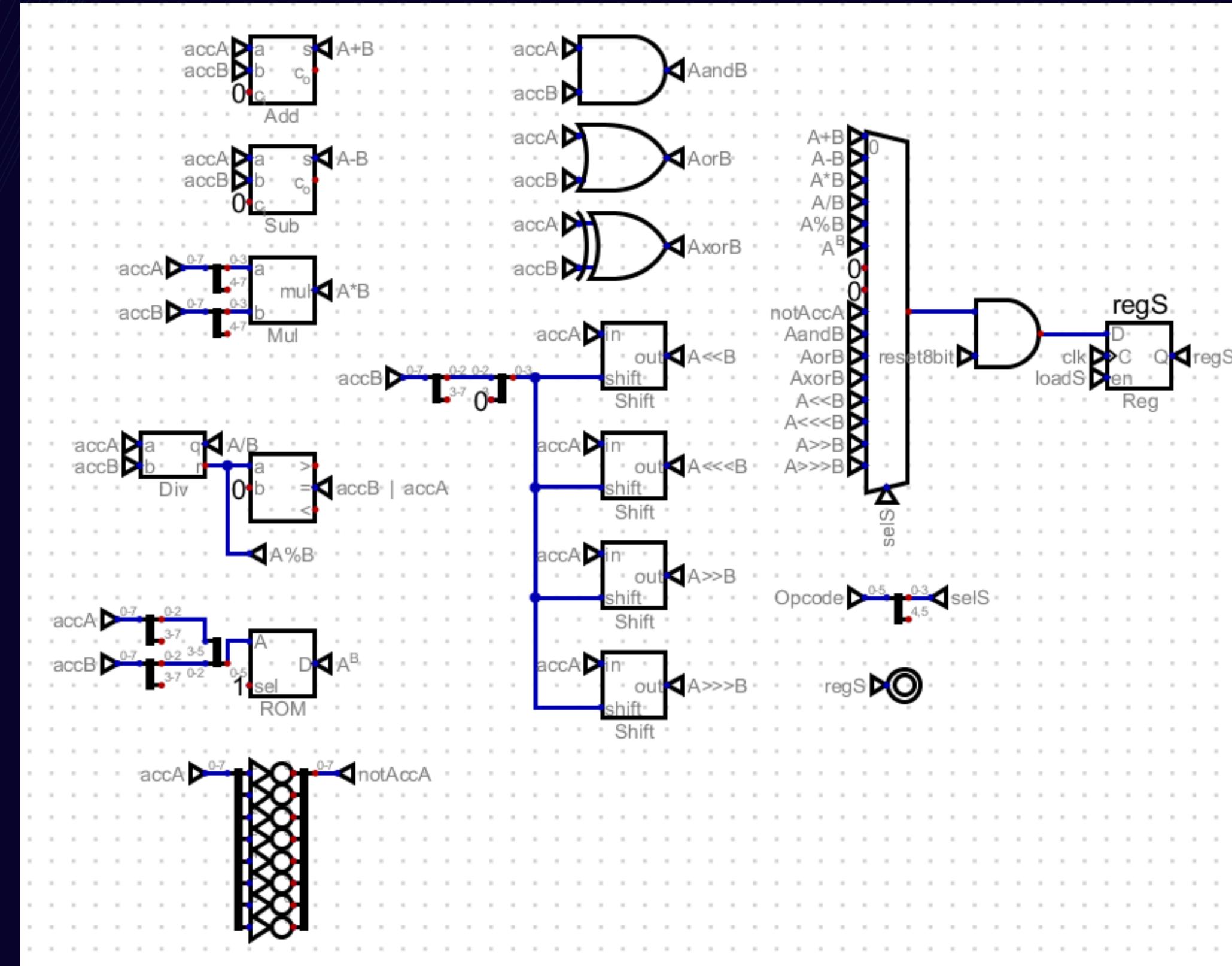

| Present State |   |   |   | Next state |    |    |    | Condition              | next state name |
|---------------|---|---|---|------------|----|----|----|------------------------|-----------------|
| A             | B | C | D | A+         | B+ | C+ | D+ |                        |                 |
| 0             | 0 | 1 | 1 | 0          | 1  | 0  | 0  | None                   | Decode          |
| 0             | 1 | 0 | 0 | 0          | 0  | 0  | 0  | Opcode = 111111        | Idle            |
|               |   |   |   | 0          | 0  | 1  | 1  | Opcode = 000000        | Fetch           |
|               |   |   |   | 0          | 1  | 0  | 1  | Opcode = 000001-010000 | Exec_Move       |
|               |   |   |   | 0          | 1  | 1  | 0  | Opcode = 010010-010111 | Exec_Jump       |
|               |   |   |   | 0          | 1  | 1  | 1  | Opcode = 010001        | rRAM_Write      |

# ◆ CONTROL UNIT TABLE

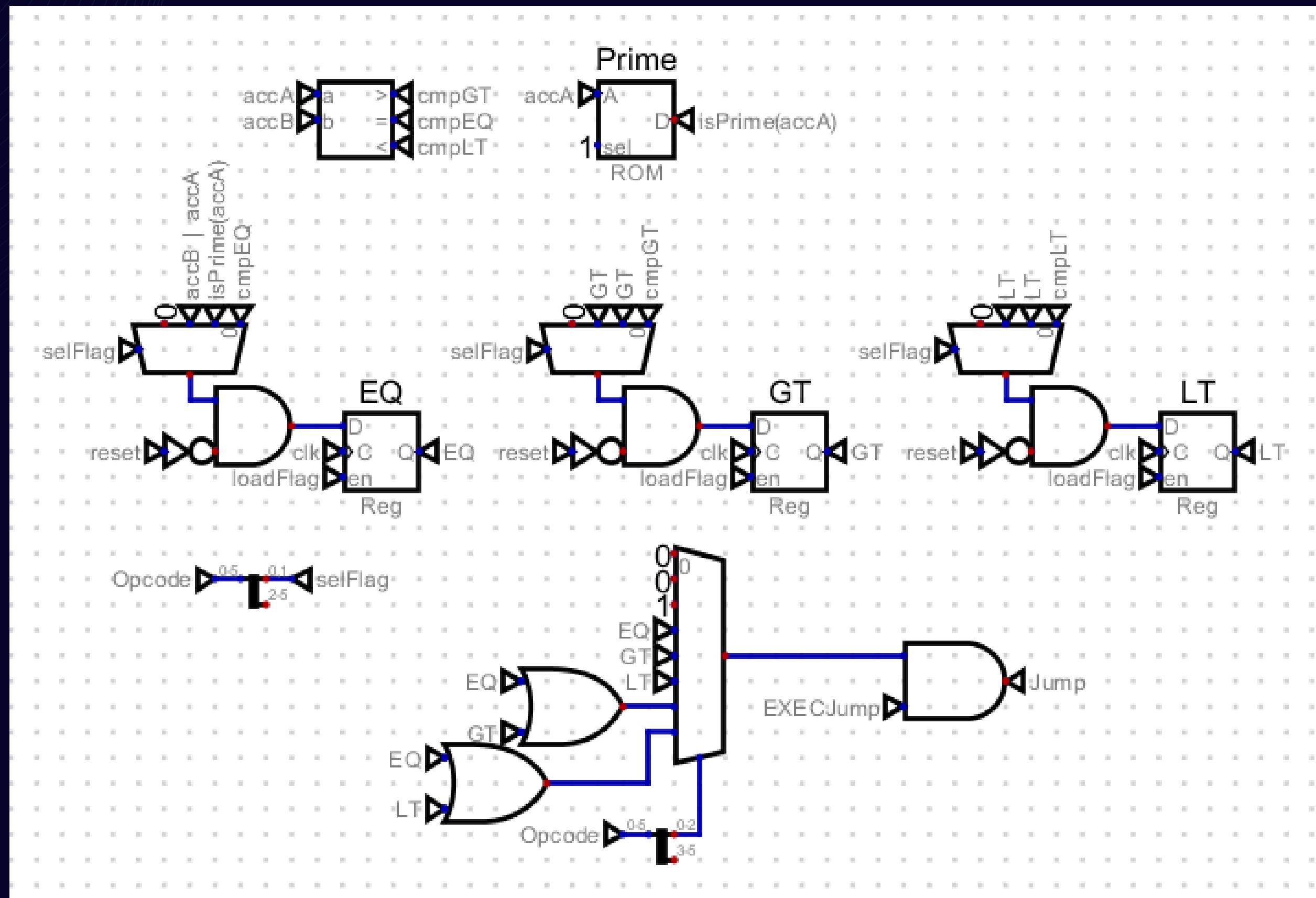
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| Present State |   |   |   | Next state |    |    |    | Condition                 | next state name |
|---------------|---|---|---|------------|----|----|----|---------------------------|-----------------|
| A             | B | C | D | A+         | B+ | C+ | D+ |                           |                 |
| 0             | 1 | 0 | 0 | 1          | 0  | 0  | 0  | Opcode =<br>100000-101111 | ALU             |
|               |   |   |   | 1          | 0  | 1  | 0  | Opcode =<br>110000-110010 | Update_Flag     |
|               |   |   |   | 1          | 0  | 1  | 1  | Opcode = 110011           | LCM             |

# ◆ ALU DATAPATH

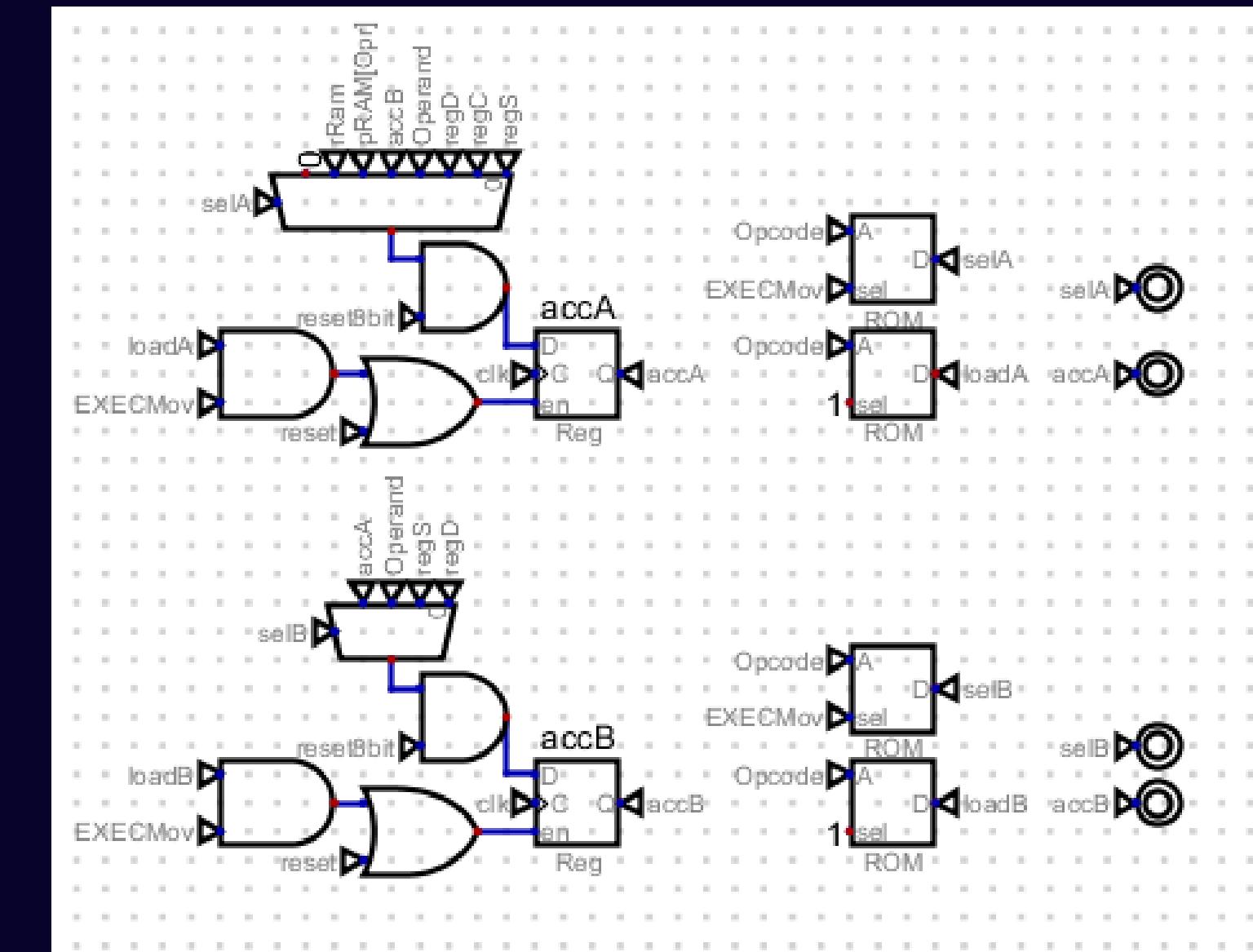
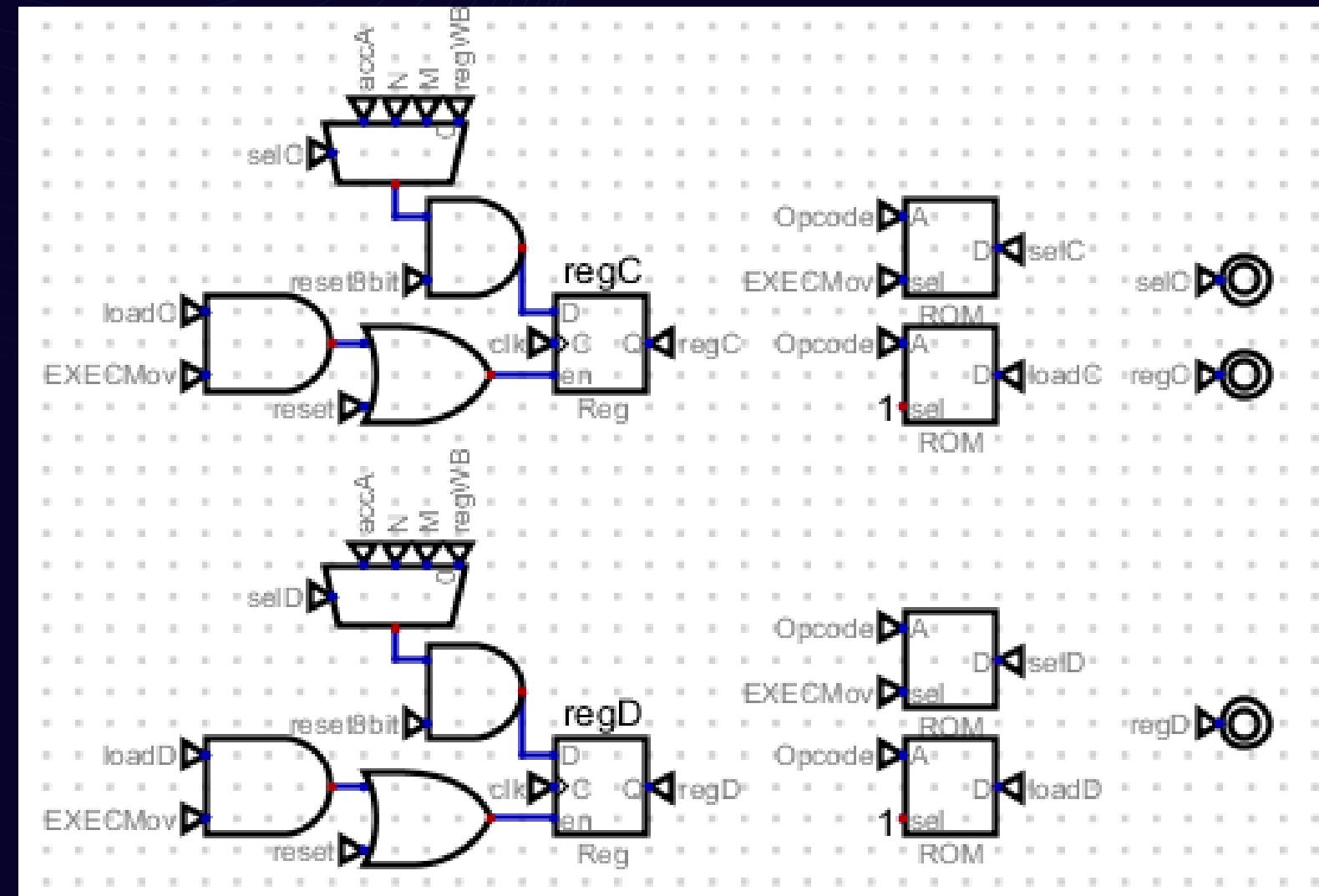
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# JUMP DATAPATH

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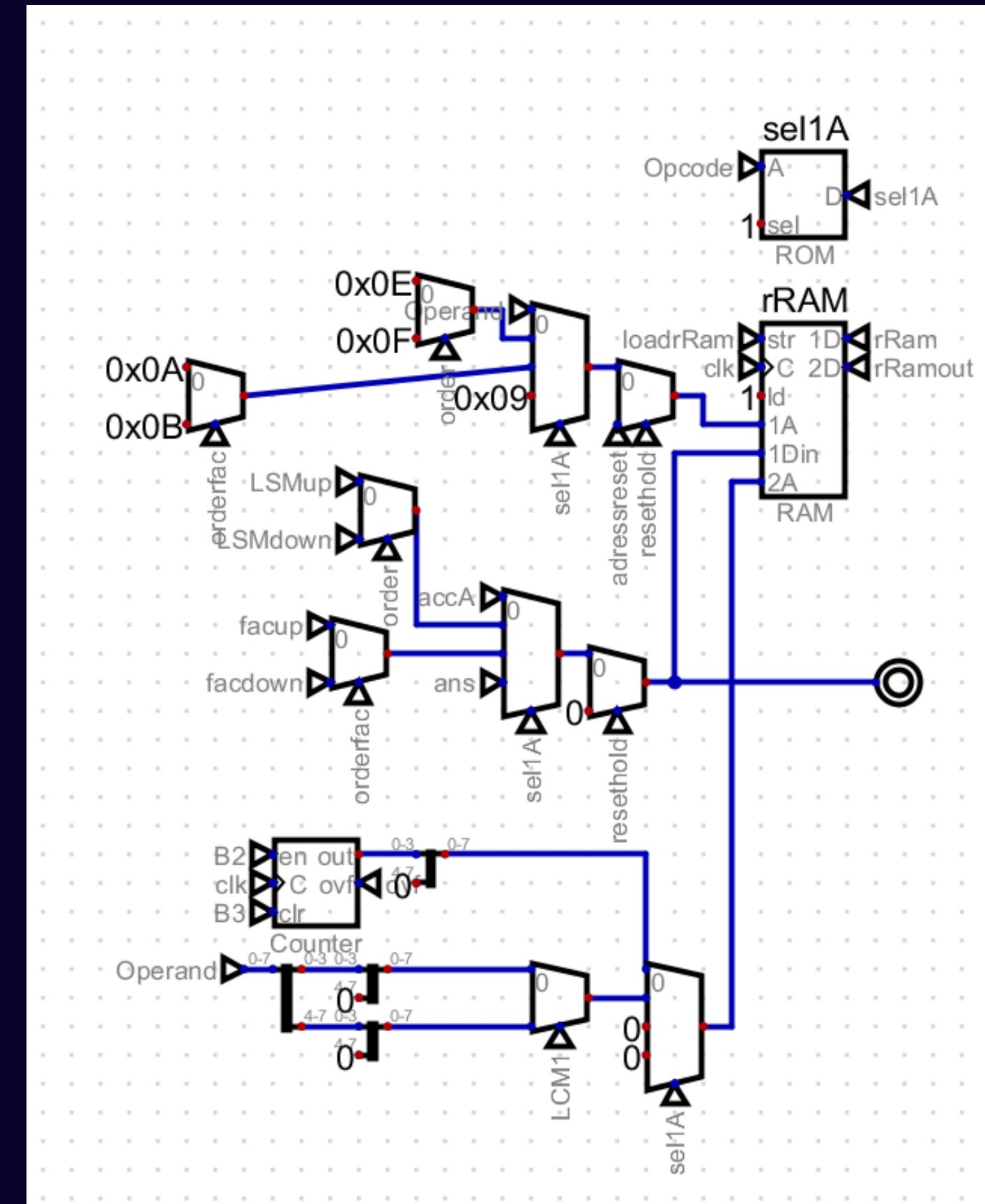


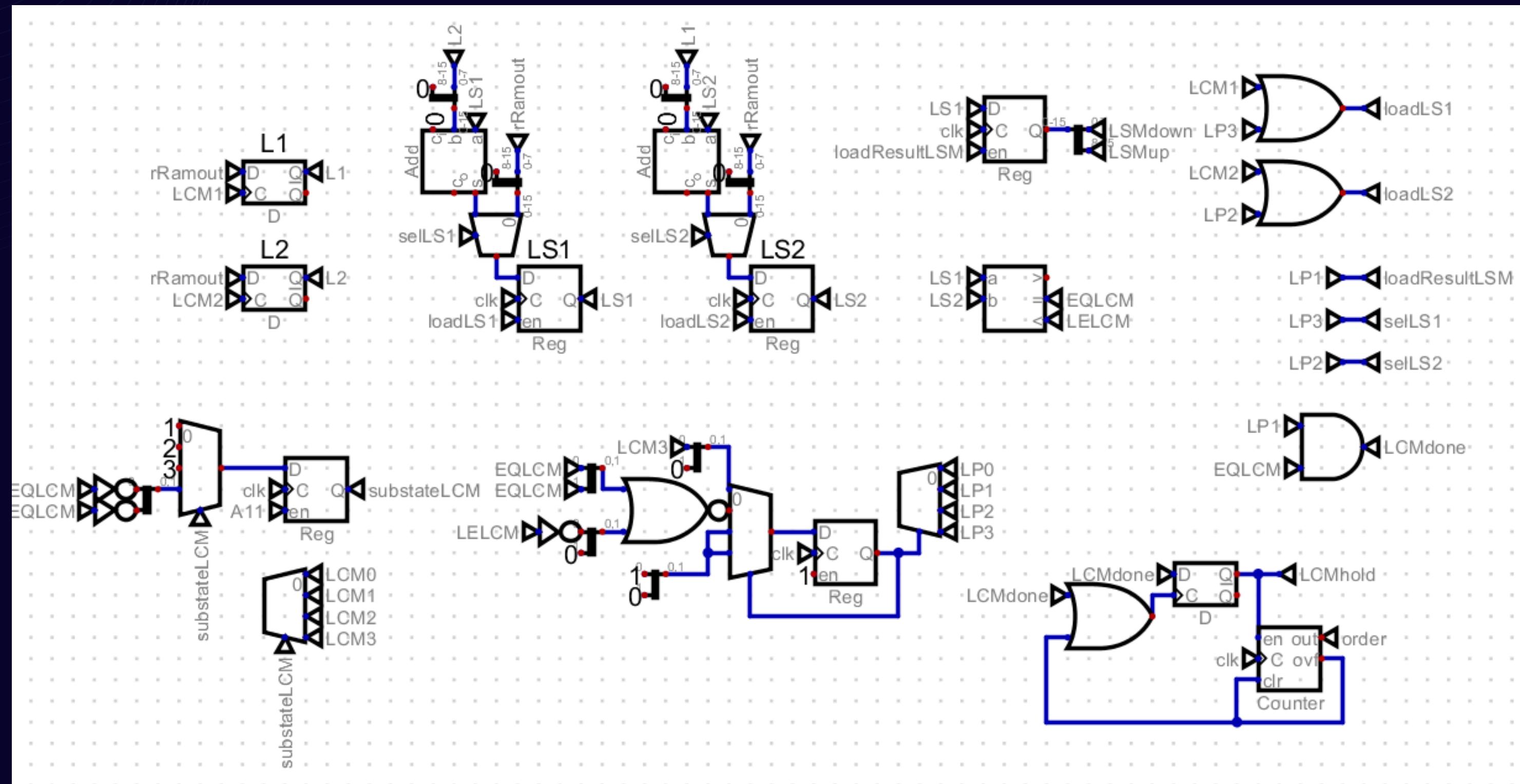
# REG DATAPATH





# RRAM DATAPTH

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# THANK YOU

