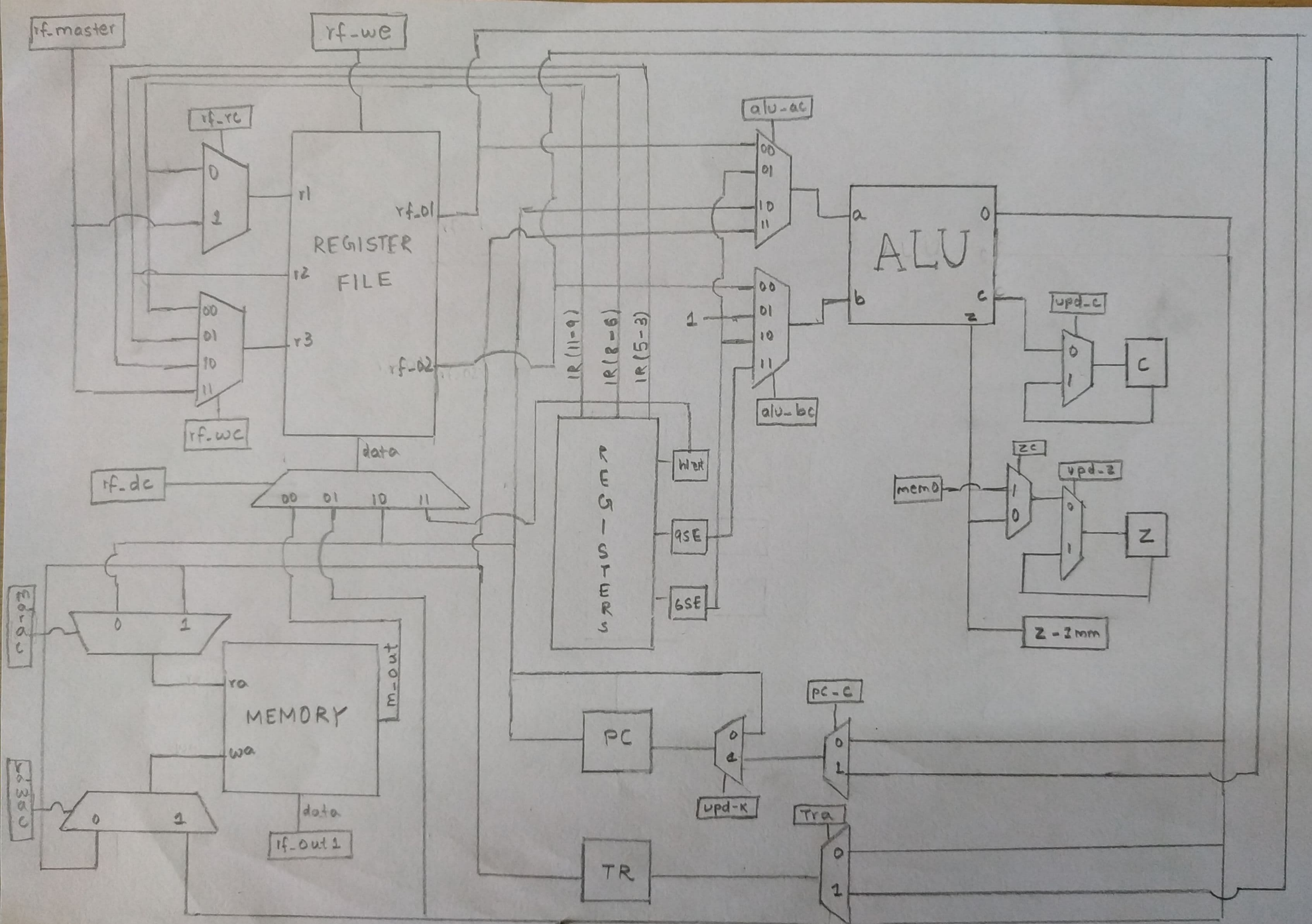
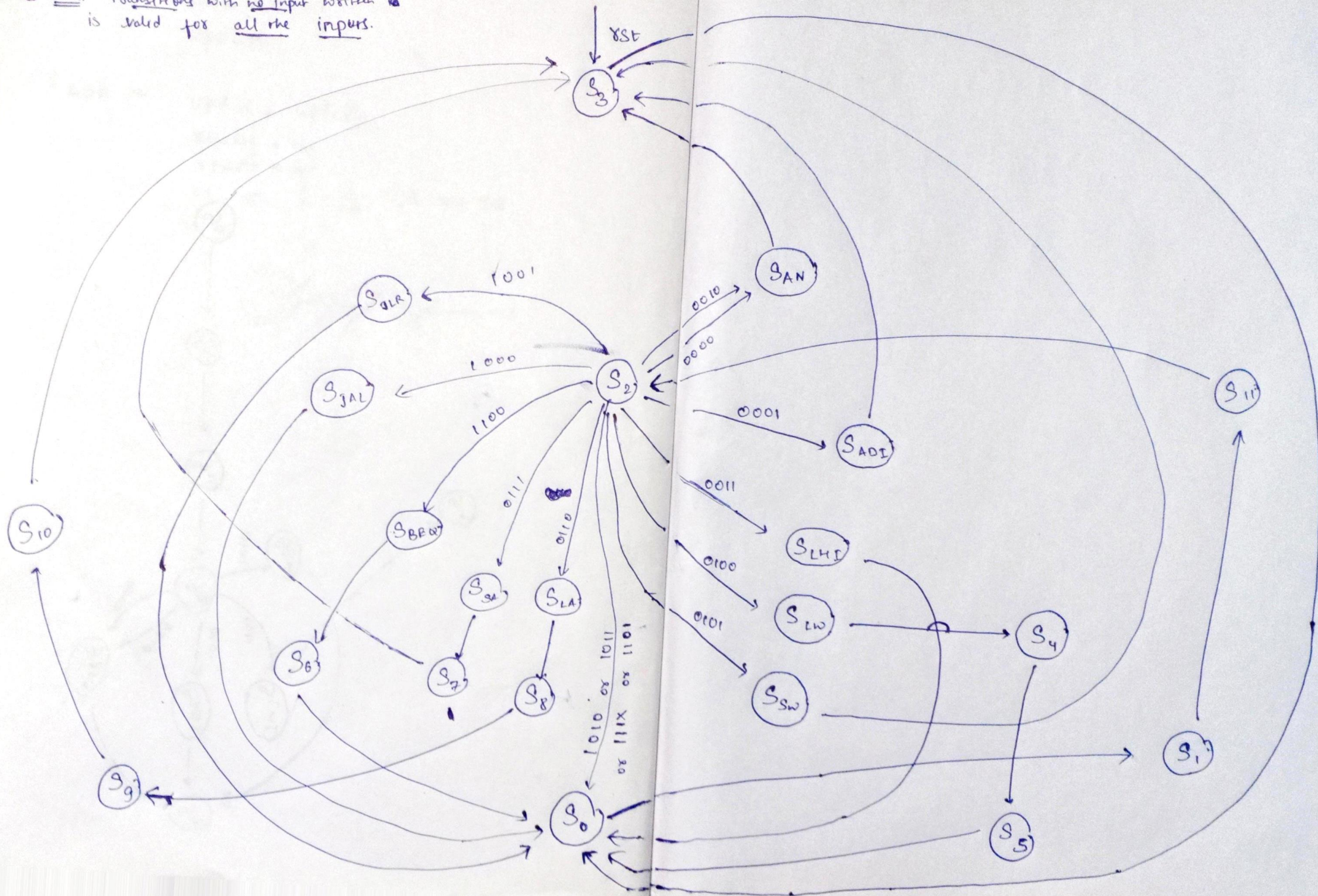


# UHCUJHH AHGRRAM





Note: Transitions with no input written is valid for all the inputs.





# States in the ~~FSM~~ FSM.

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→ ADD/ADC/ADZ

S<sub>ADD</sub> ⇒ upd\_c, upd\_z 0000  
 rf\_wc = 10                      alu\_op.  
 rf\_dc = 01  
 rf\_we } if c & z are set.

→ ADI

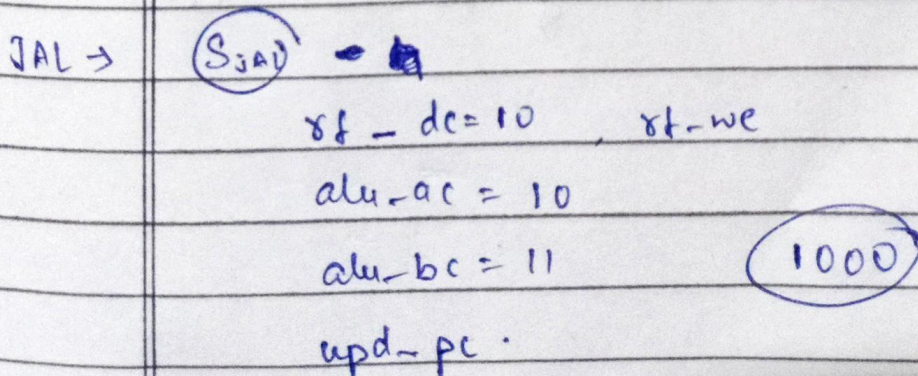
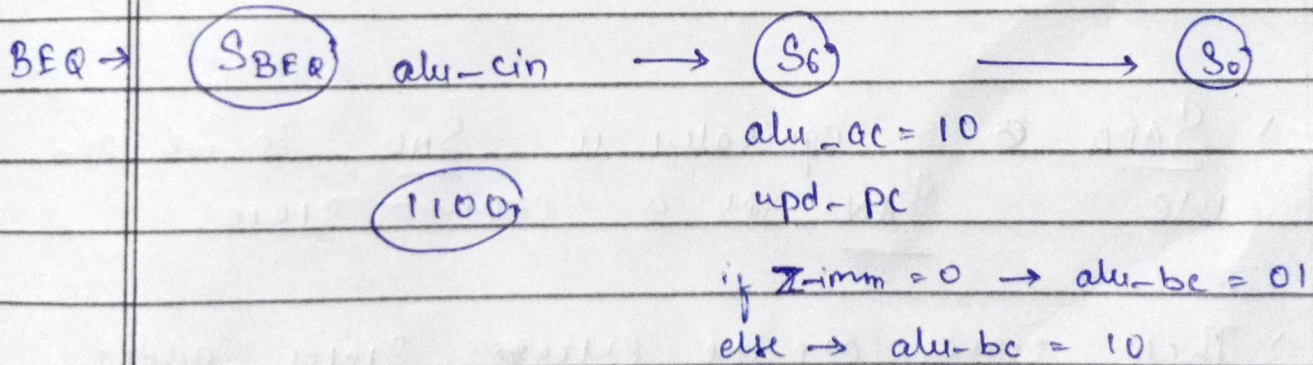
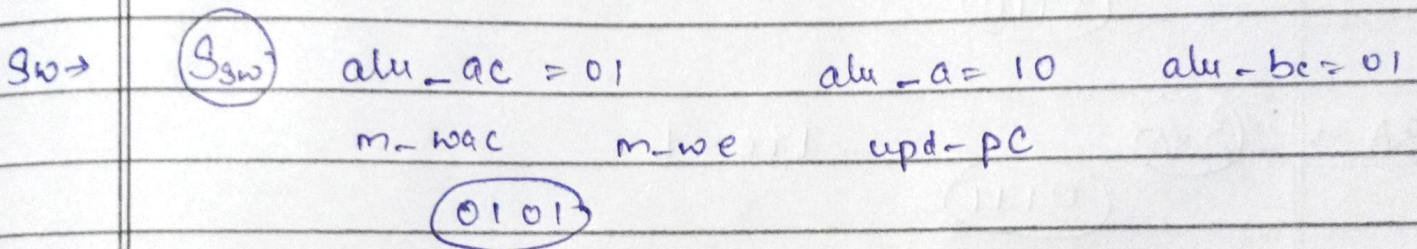
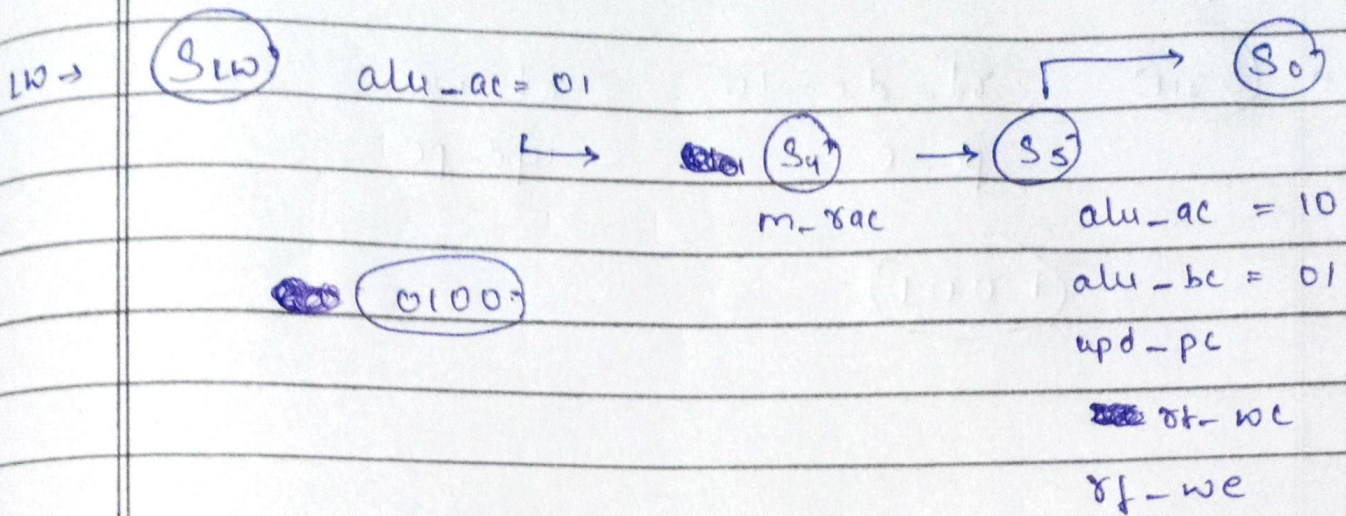
S<sub>ADI</sub> ⇒ upd\_c, upd\_z 0001  
 rf\_wc = 01  
 rf\_dc = 01  
 rf\_we  
 alu\_bc = 10

S<sub>S</sub> ⇒ alu\_ac = 10  
 alu\_bc = 01  
 upd\_pc

N DV → S<sub>ND</sub> ⇒ upd\_z, rf\_we 0010  
 N DC                      rf\_wc = 10                      alu\_op  
 N DZ                      rf\_dc = 01                      rf\_we.

LHI → S<sub>LHI</sub> ⇒ rf\_dc = 11                      alu\_ac = 10 0011  
                          rf\_we                      alu\_bc = 01  
                          upd\_pc.







SLR  $\rightarrow$  $S_{SLR}$  $rd - dc = 10$  $st - we$  $pc - c$  $upd - pc$  $1001$ LA  $\rightarrow$  $S_{LA}$  $exc = 1$  $0110$ SA  $\rightarrow$  $S_{SA}$  $exc = 1$  $0111$ 

PS:

 $\rightarrow$  $S_{ADD}$  $\bullet$ is equivalent to  $S_{ND}$  so we can

use

 $S_{AN}$ 

as a common state.

$\rightarrow$  These states are the extra states added other than those already in the code.



$$(S_4) \quad m\_rac = 1$$

$$(S_5) \quad \begin{aligned} &st\_we = 1 & upd\_pc = 1 \\ &z\_c = 1 \\ &alu\_ac = 10 \\ &alu\_bc = 01 \end{aligned}$$

$$(S_6) \quad \begin{aligned} &alu\_pc = 10 & alu\_bc = \begin{cases} 01 \\ 10 \end{cases} & \begin{array}{l} \text{if } z\_imm = 1 \\ \text{else} \end{array} \\ &upd\_pc = 1 \end{aligned}$$

$$(S_7) \quad \begin{aligned} &st\_rc = 1 & alu\_ac = 11 \\ &m\_we = 1 & alu\_bc = 01 \end{aligned}$$

$$(S_8) \quad \begin{aligned} &m\_rac = 1 \\ &alu\_ac = 11 \\ &alu\_bc = 01 \end{aligned}$$

$$(S_9) \quad \begin{aligned} &m\_rac = 1 & st\_we = 1 \\ &alu\_ac = 11 & st\_wc = 11 \\ &alu\_bc = 01 \end{aligned}$$

$$(S_{10}) \quad \begin{aligned} &st\_we = 1 \\ &st\_wc = 11 \end{aligned}$$