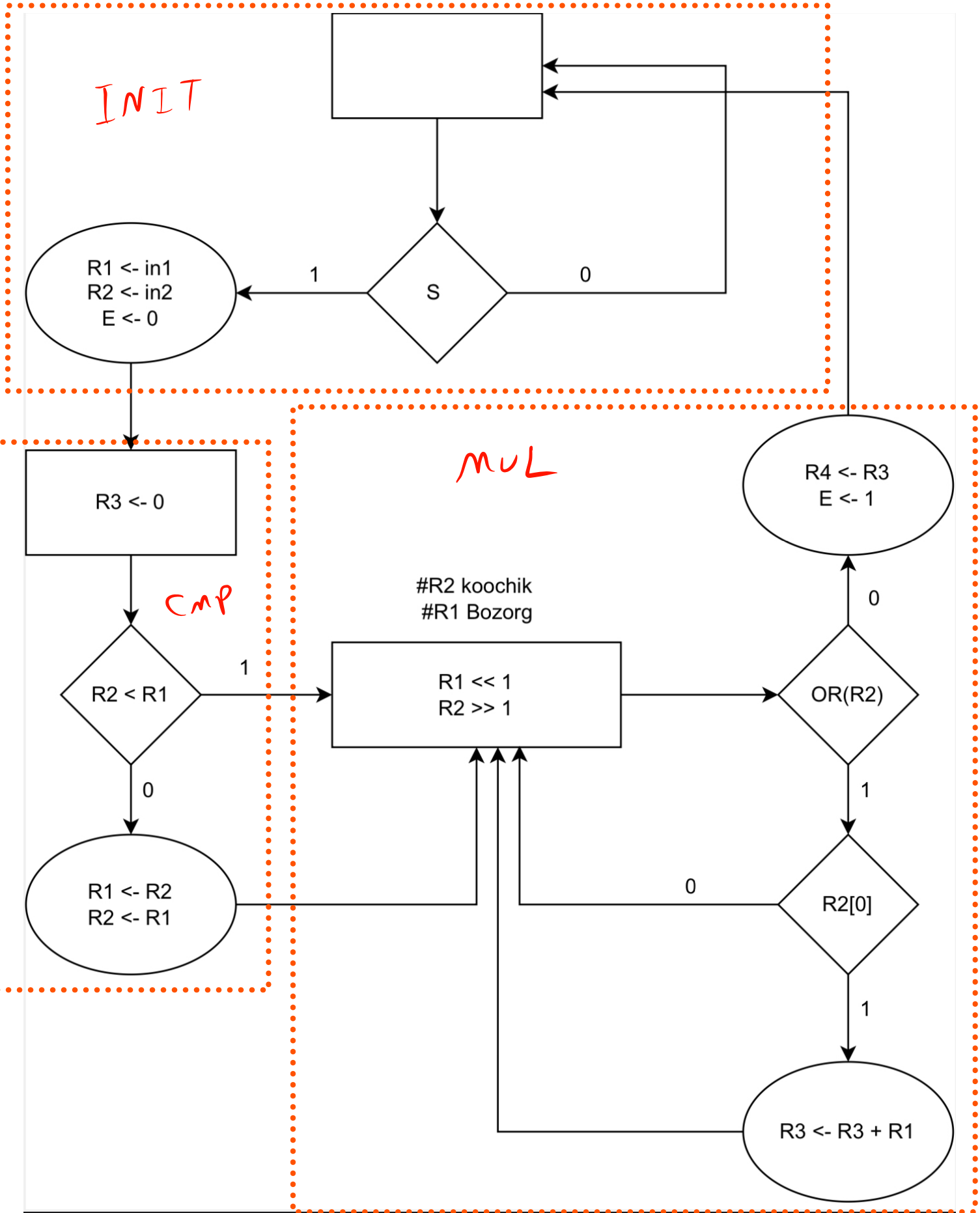
محمد پیام تابئی ۴۰۰۱۰۴۸۵۷ تمرین یک DSD

ضرب کننده

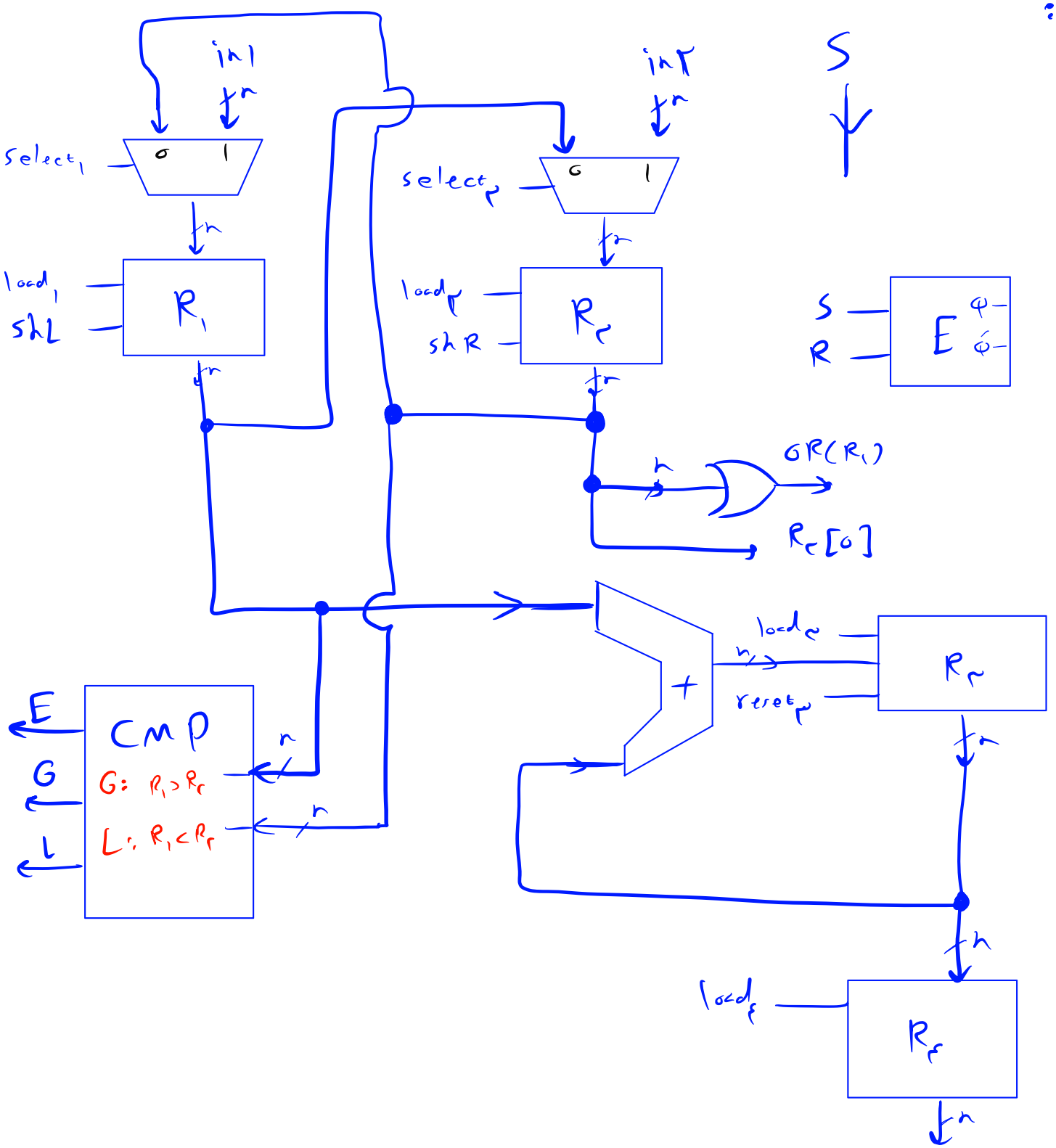


CLOCK	ASM BLOCK	R1	R2	R3	R4	E
1	INIT	-	0	-	-	1
2	CMP	110	1010	-	-	0
3	MUL	1010	110	0	-	0
4	MUL	10100	11	0	-	0
5	MUL	101000	1	10100	-	0
6	MUL	1010000	0	111100	-	0
7	INIT	10100000	0	111100	111100	1

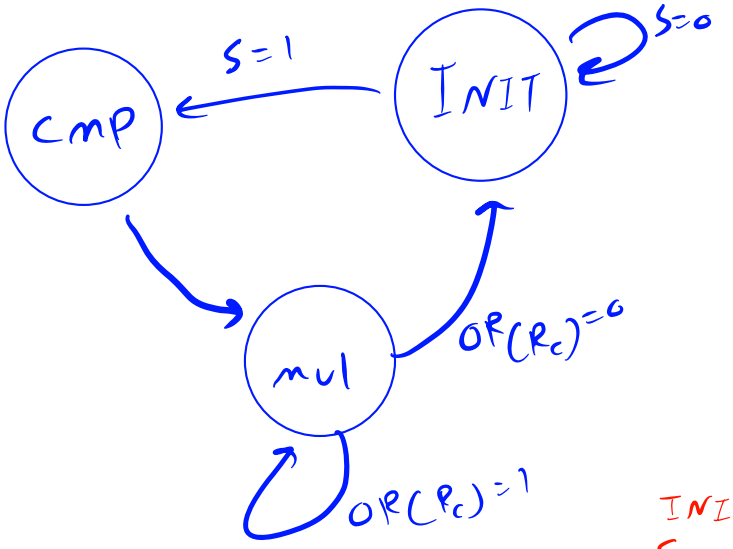
جواب نهائي

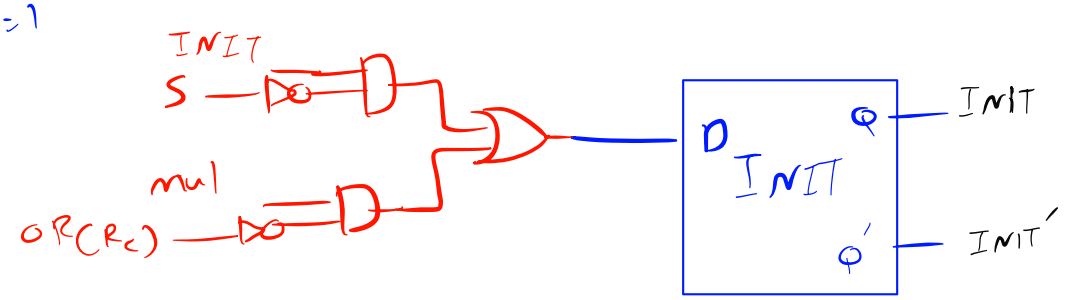
١١٠ x ١٠١٠ = ١١ ١١٠٠

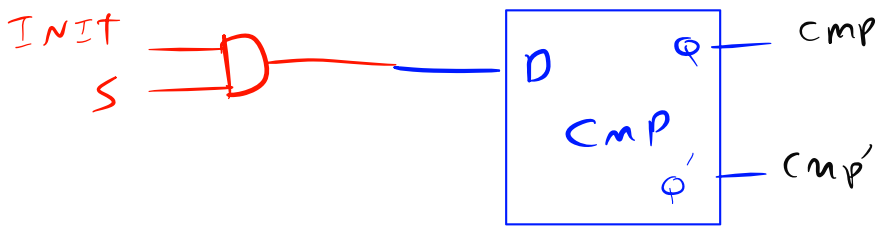
:DP

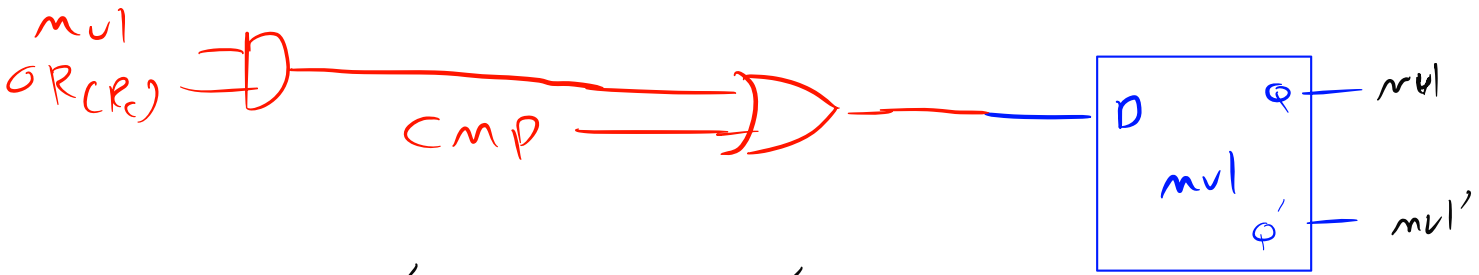

in1
n
in2
n
S
select1
0
1
select2
0
1
load1
shL
R1
load2
shR
R2
S
R
E
φ-
φ-
n
OR(R1)
R2[0]
CMP
E
G
L
n
G: R1 > R2
L: R1 < R2
n
+
load3
n
reset3
R3
load4
R4
n
n

: CU









$$D_{INIT} = INIT.s' + mul.OR(R_c)'$$

$$D_{cmp} = INIT.s$$

$$D_{mul} = mul.OR(R_c) + cmp$$

$load_1 = INIT.S + CMP.G'$

$load_2 = INIT.S + CMP.G'$

$load_P = MUL.OR(R_2).R_2[0]$

$load_E = MUL.OR(R_2)'$

$reset_P = CMP$

$select_1 = INIT$

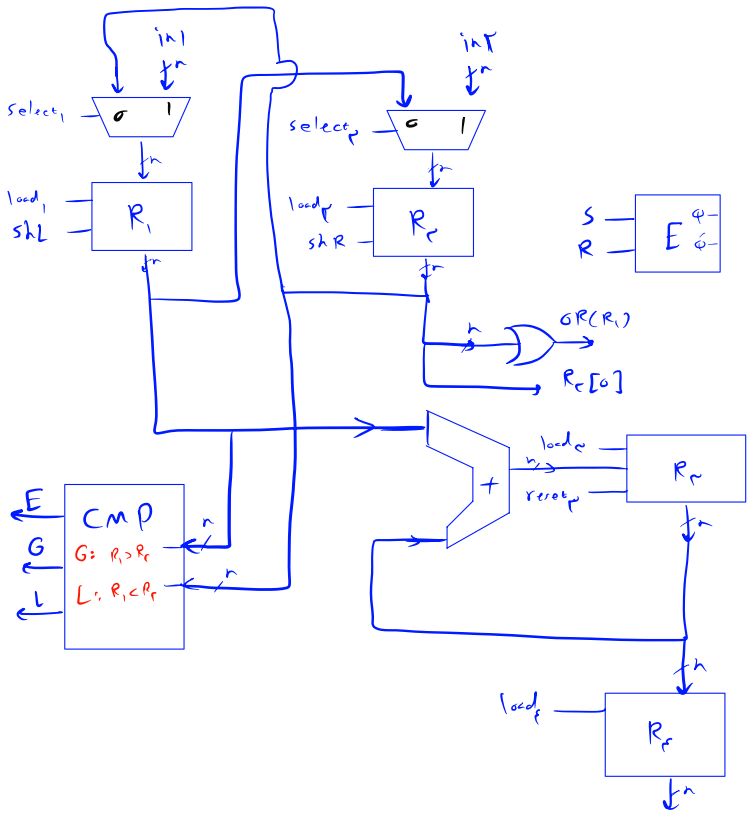
$select_2 = INIT$

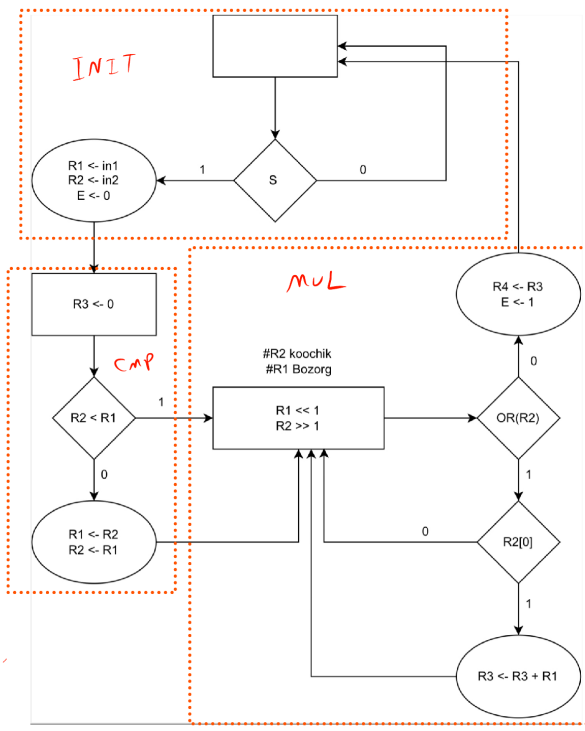
$shR = MUL$

$shL = MUL$

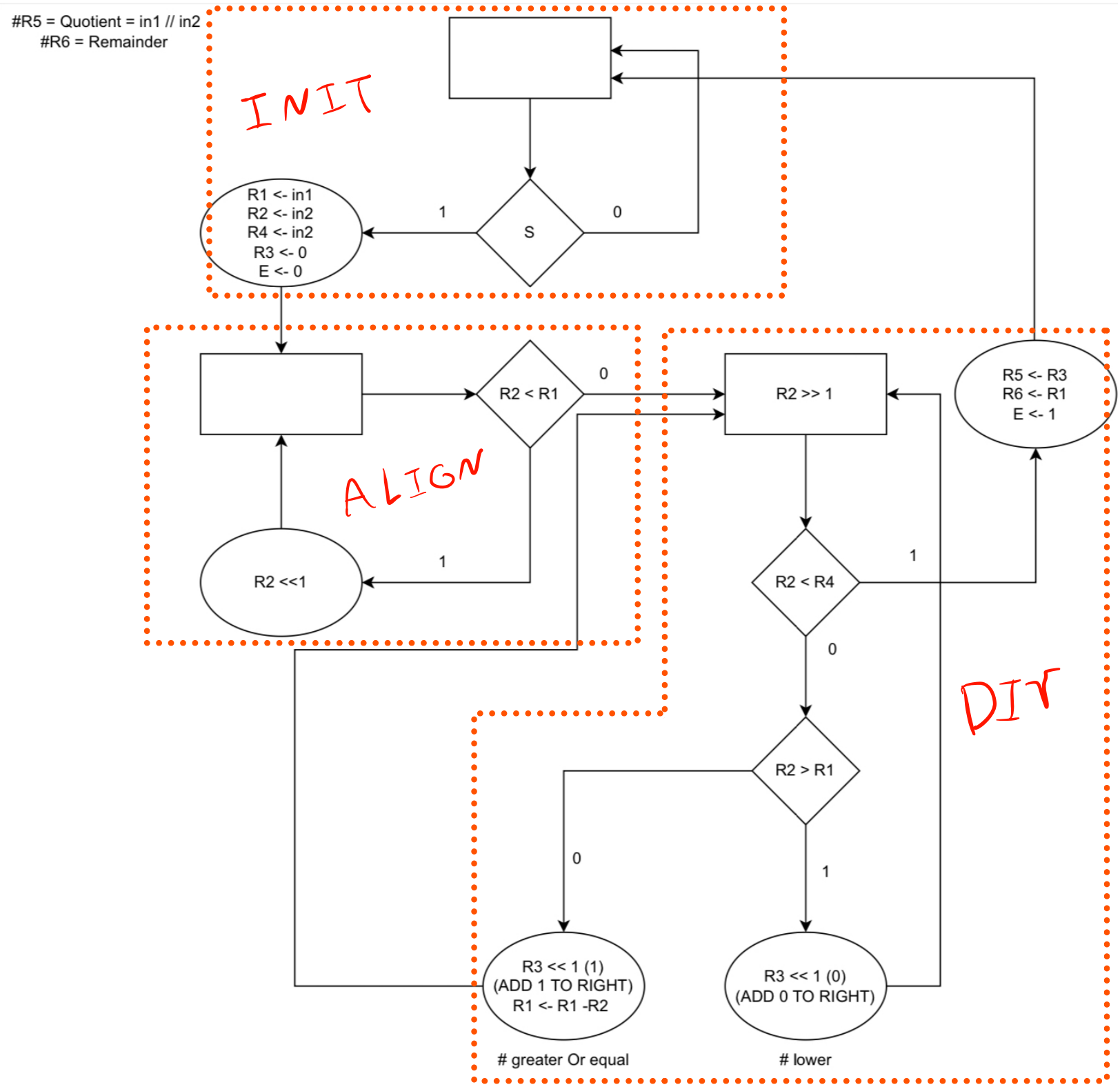
$S = MUL.OR'(R_2)$

$R = INIT.S$





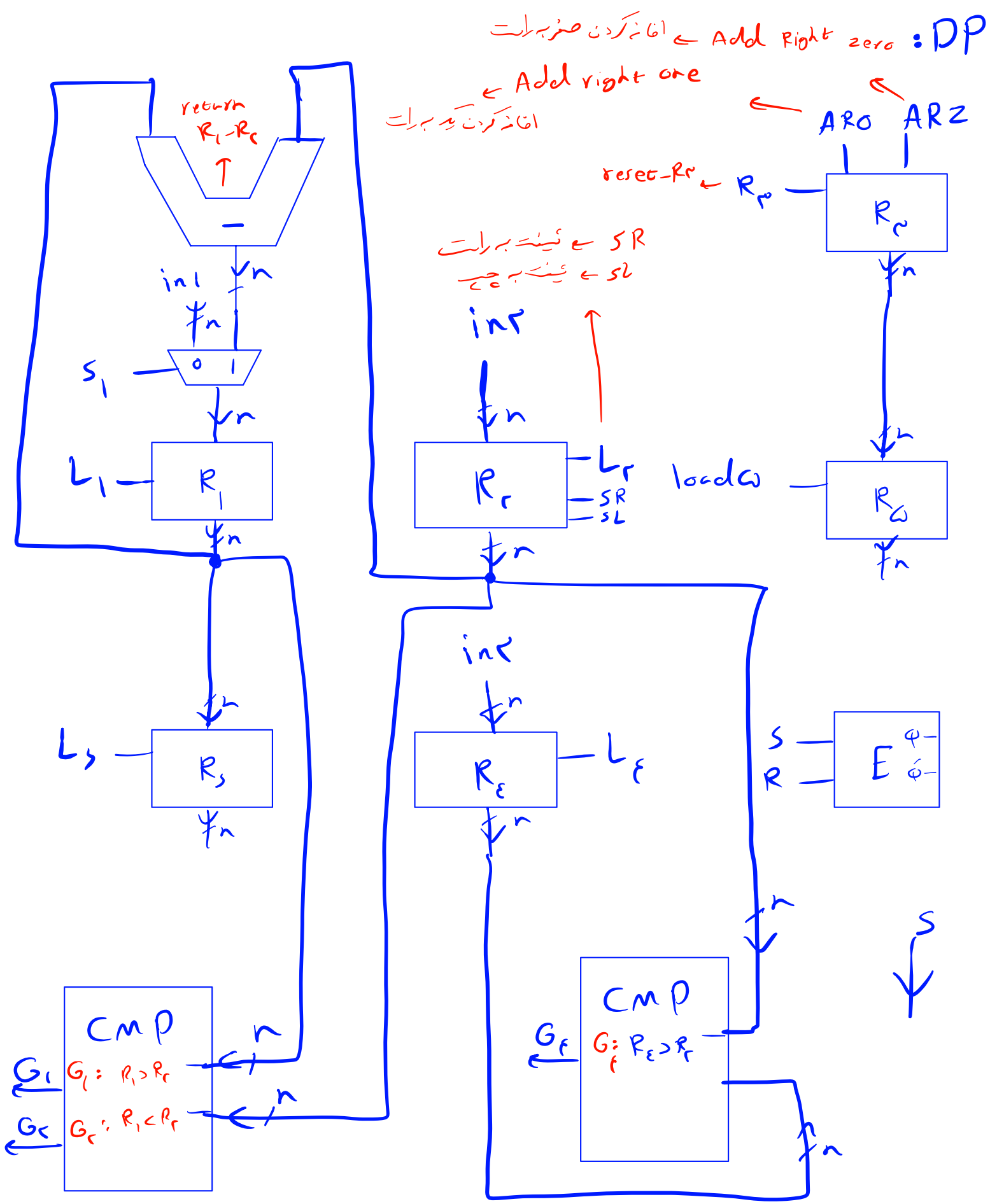
تقسیم کننده


#R5 = Quotient = in1 // in2
#R6 = Remainder
INIT
R1 <- in1
R2 <- in2
R4 <- in2
R3 <- 0
E <- 0
S
1
0
ALIGN
R2 < R1
0
1
R2 <<1
R2 >> 1
R5 <- R3
R6 <- R1
E <- 1
R2 < R4
1
0
DIV
R2 > R1
0
1
R3 << 1 (1)
(ADD 1 TO RIGHT)
R1 <- R1 -R2
# greater Or equal
R3 << 1 (0)
(ADD 0 TO RIGHT)
lower

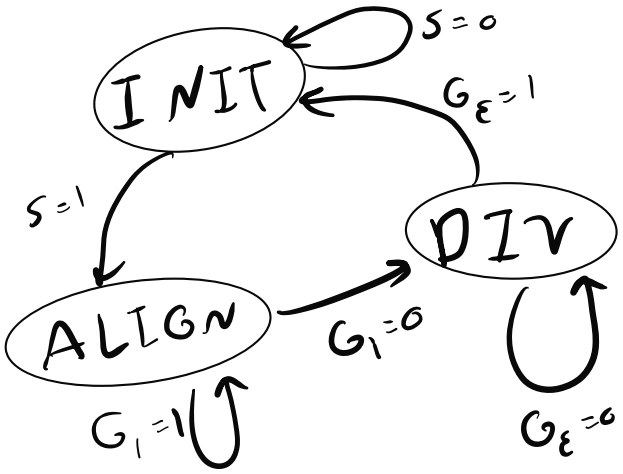
CLOCK	ASM BLOCK	R1	R2	R3	R4	R5	R6	E
1	INIT	-	0	-	-	-	-	1
2	ALIGN	10011	101	0	101	-	-	0
3	ALIGN	10011	1010	0	101	-	-	0
4	ALIGN	10011	10100	0	101	-	-	0
5	DIV	10011	10100	0	101	-	-	0
6	DIV	10011	1010	0	101	-	-	0
7	DIV	01001	101	1	101	-	-	0
8	DIV	100	10	11	101	-	-	0
9	INIT	100	1	11	101	11	100	1

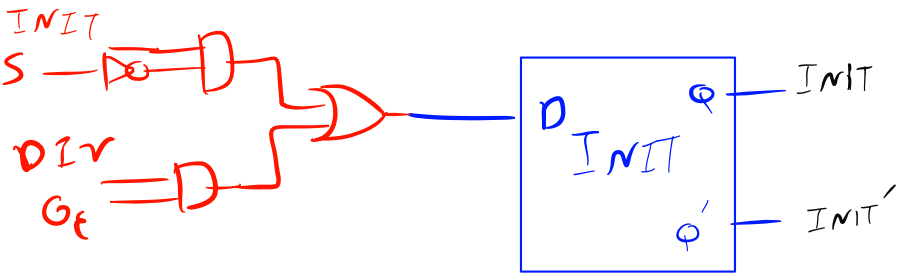
خارج قسمت

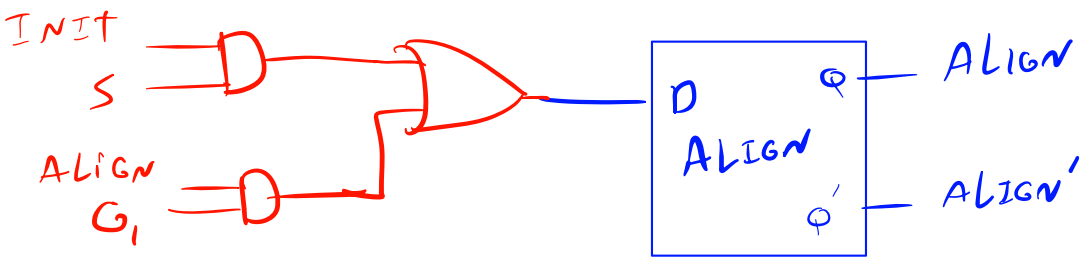
باقی مانده

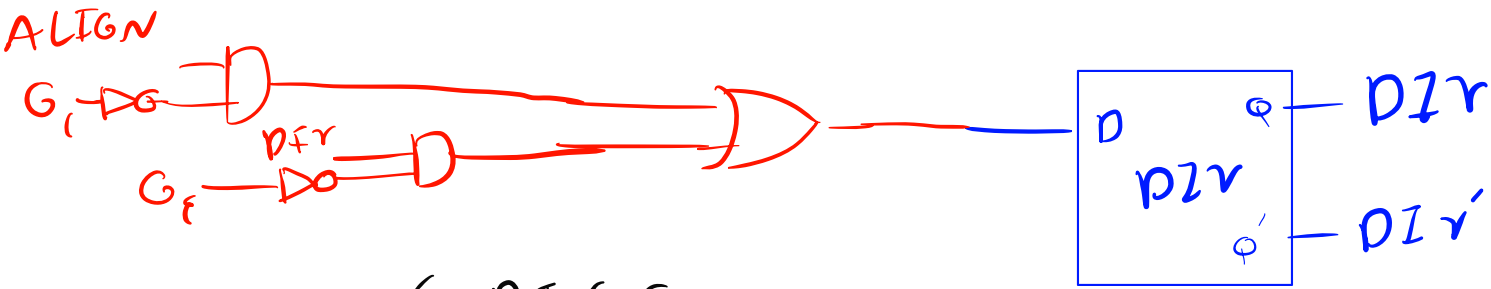

DP : Add Right zero ← اضافه کردن صفر به راست
Add right one ← اضافه کردن یک به راست
AR0
AR1
reset-R2 ← R2
R2
SR ← شیفت به راست
SL ← شیفت به چپ
return R1-R5
in1
in2
in3
in4
S1
R1
R2
R3
R4
R5
L1
L2
L3
L4
SR
SL
loadQ
S
R
E
CMP
G1: R1>R5
G5: R1<R5
G4: R4>R2

: CU









$$D_{INIT} = INIT.S' + DIV.G_E$$

$$D_{ALIGN} = INIT.S + ALIGN.G_1$$

$$D_{DIV} = ALIGN.G_1' + DIV.G_E'$$

$L_1 = INIT.S + DIV.G_3'.G_4'$

$S_1 = INIT'$

$L_4 = INIT.S$

$SR = DIV$

$SL = ALIGN.G_1$

$R_2 = INIT.S$

$ARO = DIV.G_3'.G_4'$

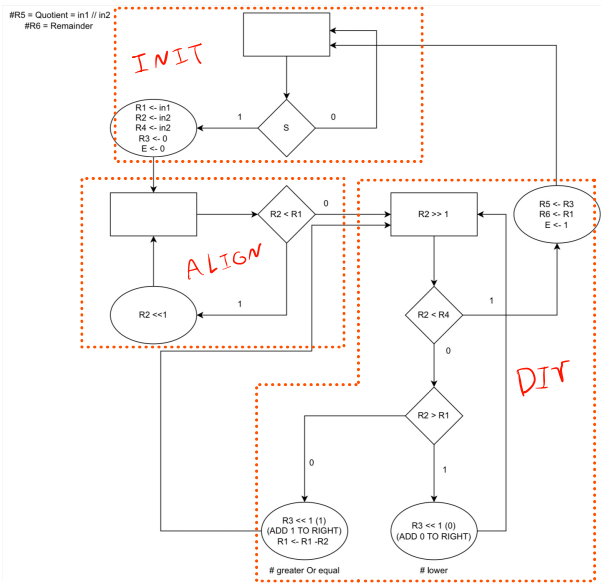
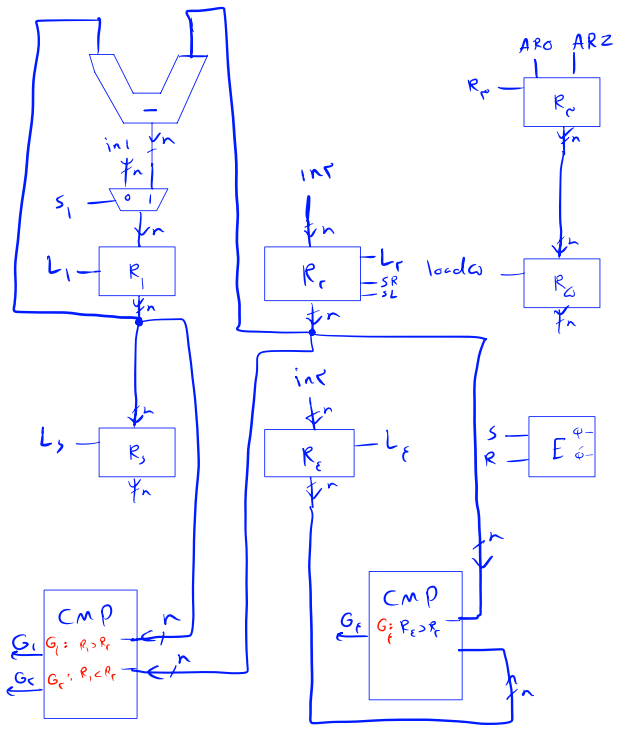
$ARZ = DIV.G_3'.G_4$

$L_3 = INIT.S$

$L_0 = DIV.G_3$

$L_5 = DIV.G_3$

$S = DIV.G_4$

$R = INIT.S$

: Command signal