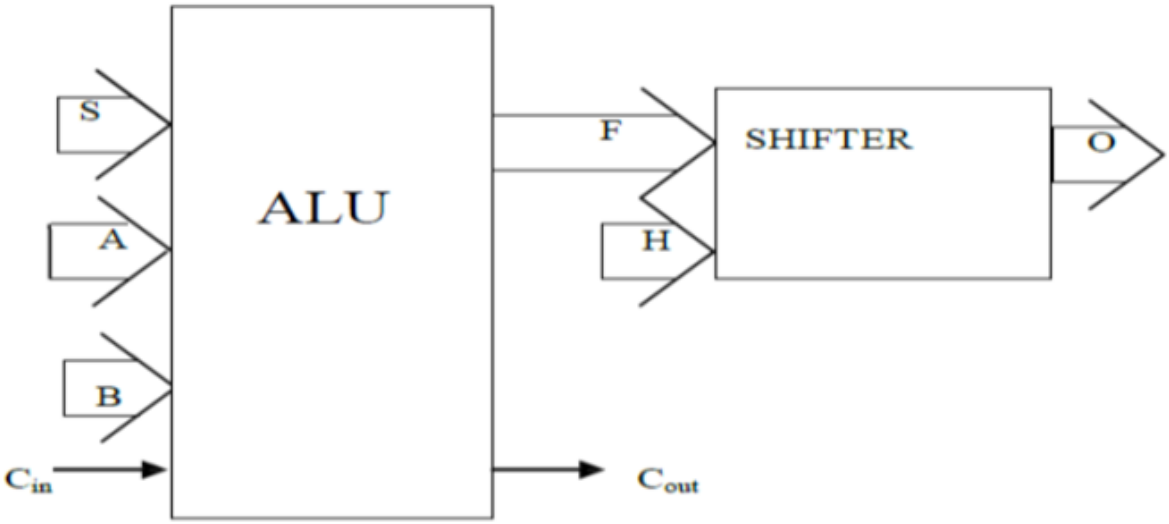
Design Project: Design of ALU with Shifter Summer 2018 (Tuesday slot)



H	H	Operation	Function	Input	Output
0	0	O=SHR(F)	Shift 1-bit right	$A_3A_2A_1A_0$	$A_0A_3A_2A_1$
0	1	O=SHL(F)	Transfer (no shift)	$A_3A_2A_1A_0$	$A_3A_2A_1A_0$
1	0	O=F	Shift 1-bit left	$A_3A_2A_1A_0$	$A_2A_1A_0A_3$
1	1	O=0	Transfer 0	$A_3A_2A_1A_0$	0000

Op No.	F	Description	B_{in}	C_{in}	C_{pass}	Result	A	B	F	C_{out}
1	A AND B	Bitwise AND	B	0	0	carry	1011	0011	0011	0
2	A XOR B	Bitwise XOR	B	0	0	Sum	1011	0011	1000	0
3	A-1	Decrement A	1	0	carry	Sum	1011	0011	1010	Carry
4	A OR B	Bitwise OR	B	1	1	carry	1011	0011	1011	0
5	A+B	Add A to B	B	0	carry	Sum	1011	0011	1110	Carry
6	A+1	Increment A	0	1	carry	Sum	1011	0011	1100	Carry
7	A’	Complement of A	1	0	0	Sum	1011	0011	0100	0
8	A-B	Subtract B from A	B’	1	carry	Sum	1011	0011	1000	Carry

Student ID: 12345XYZ G=(X+Y+Z)/10=remainder

$S_2S_1S_0$	G-0	G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9
000	3	7	1	8	2	5	4	6	4	5
001	7	2	5	2	8	6	1	5	7	8
010	4	8	6	7	6	1	3	1	2	3
011	1	6	3	5	3	8	6	4	5	1
100	6	5	7	4	1	4	7	7	1	4
101	2	4	2	1	7	2	2	3	8	6
110	5	3	8	6	5	3	5	8	3	7
111	8	1	4	3	4	7	8	2	6	2