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CSC 220

PROJECT

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COMPUTER ORGANIZATION

Test cases:

- Arithmetic operations

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	0	0	0	$G=X+Y'$	10001111	10000001	00001101	1	0	0	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	0	0	1	$G=X-Y$	10001111	10000001	00001110	1	0	0	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	0	1	0	$G=X$	10001111	X	10001111	0	0	1	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	0	1	1	$G=X+1$	10001111	X	10010000	0	0	1	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	1	0	0	$G=X+2$	10001111	X	10010001	0	0	1	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	1	0	1	$G=X+3$	10001111	X	10010010	0	0	1	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	1	1	0	$G=X*2$	10001111	X	00011110	1	1	0	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
0	1	1	1	$G=X*2+1$	10001111	X	00011111	1	1	0	0

- Logical Operations

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	0	0	0	$G=X \text{ XOR } Y$	10001111	10000001	00001110	X	X	X	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	0	0	1	$G=X \text{ OR } Y'$	10001111	10000001	11111111	X	X	X	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	0	1	0	$G=X \text{ NAND } Y$	10001111	10000001	01111110	X	X	X	0

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	0	1	1	$G=X'$	10001111	X	01110000	X	X	X	0

- **Shifting Operations**

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	1	0	0	G=Y	X	10000001	10000001	X	X	X	X

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	1	0	1	G=Arithmetic Shift Right Y	X	10000001	11000000	X	X	X	X

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	1	1	0	G=Logical Shift Right Y	X	10000001	01000000	X	X	X	X

Input				Operation	Input		Expected output				
S3	S2	S1	S0		X	Y	G	C	V	N	Z
1	1	1	1	G=Switch Tail Left Y	X	10000001	00000010	X	X	X	X

- The Circuit:

