I-CHIP PS 1

Done by Ashutosh Awasthi and Neeraj Kumar

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1 EXPLANATION OF CALC MODULE

The Input and Output variables are taken exactly as mentioned in PS. We have implemented DataFlow Modelling to solve the PS. Our logic behind is that if zx is 0, wire x1 is given value of x and otherwise 0. Now if nx is 0, wire x2 is given value of x1 and otherwise !x1 (means inverting each bit). Similarly values of y1 and y2 are obtained based on values of zy and ny. Then on basis of value of 'f' is 1 or 0 ,wire z1 is assigned a value (x2+y2) or (x2&y2) ,respectively. Output variable 'o' is given value z1 if 'no' is 0 and otherwise !z1. Output variable 'zr' is given value as negation of '|o' (unary operator which performs OR operation on all bits) because if OR of all the bits of 'o' is zero then o is zero, that means zr will be 1. As output 'o' is a signed number the 7th bit i.e, MSB will give the sign of the number.Therefore o[7] is equel to ng.

2 CONTROL BITS FOR DESIRED OUTPUTS

Desired Output	zx	nx	zy	ny	f	no
0	1	0	1	0	0	0
1	1	1	1	1	1	1
-1	1	1	1	0	1	0
x	0	0	1	0	1	0
y	1	0	0	0	1	0
!x	0	1	1	0	1	0
!y	1	0	0	1	1	0
-x	0	0	1	1	1	1
-y	1	1	0	0	1	1
x+1	0	1	1	1	1	1
y+1	1	1	0	1	1	1
x-1	0	0	1	1	1	0
y-1	1	1	0	0	1	0
x+y	0	0	0	0	1	0
x-y	0	1	0	0	1	1
y-x	0	0	0	1	1	1
x&y	0	0	0	0	0	0
x|y	0	1	0	1	0	1