COMSM1302 In-Class Test 1 Reference Sheet

Logarithm calculation formula: For any base b, $\log_2(x) = \log_b(x)/\log_b(2)$.

Base 10	Symbol	Name	Base 2	Symbol	Name
$\vdots$			$\vdots$		
10^{15}	P	Peta-	2^{50}	P or Pi	Peta- or pebi-
10^{12}	T	Tera-	2^{40}	T or Ti	Tera- or tebi-
10^{9}	G	Giga-	2^{30}	G or Gi	Giga- or gibi-
10^{6}	M	Mega-	2^{20}	M or Mi	Mega- or mebi-
10^{3}	k	Kilo-	2^{10}	K or Ki	Kilo- or kibi-
10^{0}	N/A	N/A	2^{0}	N/A	N/A
10^{-3}	m	Milli-			
10^{-6}	μ	Micro-			
10^{-9}	n	Nano-			
10^{-12}	p	Pico-			
$\vdots$					

Table 1: Reference for SI units (base 10 and base 2).

pre-setting the x input		pre-setting the y input		computing + or &	post-setting the output	resulting ALU output
if zx then x=0	if nx then x=!x	if zy then y=0	if ny then y=!y	if f then out=x+y else out=x&y	if no then out=!out	out(x,y) =
zx	nx	zy	ny	f	no	out
1	0	1	0	1	0	0
1	1	1	1	1	1	1
1	1	1	0	1	0	-1
0	0	1	1	0	0	x
1	1	0	0	0	0	y
0	0	1	1	0	1	!x
1	1	0	0	0	1	!y
0	0	1	1	1	1	-x
1	1	0	0	1	1	-y
0	1	1	1	1	1	x+1
1	1	0	1	1	1	y+1
0	0	1	1	1	0	x-1
1	1	0	0	1	0	y-1
0	0	0	0	1	0	x+y
0	1	0	0	1	1	x-y
0	0	0	1	1	1	y-x
0	0	0	0	0	0	x&y
0	1	0	1	0	1	x|y

Table 2: Behaviour reference for the Hack ALU (taken from Nisan and Schocken).