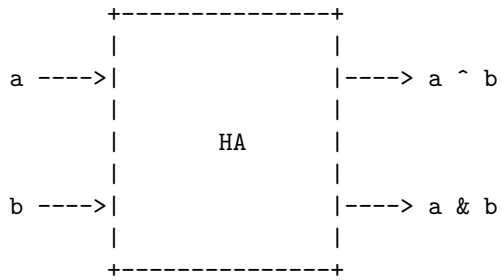


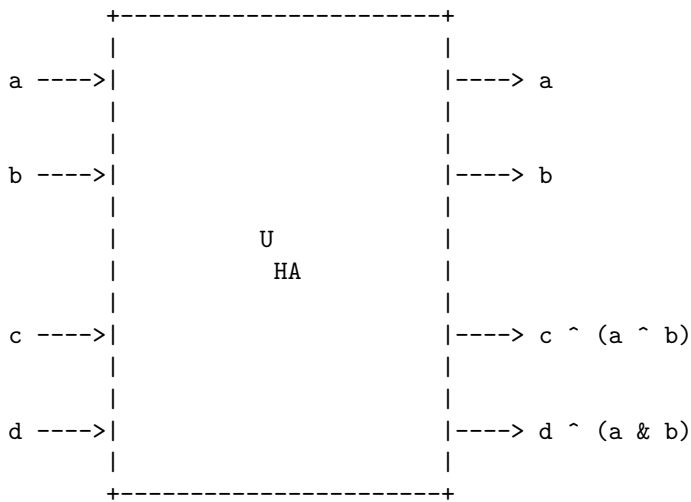
1 Reversible Half Aadder

Half-Adder:



a	b	$a \oplus b$	$a \& b$
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

reversible:



a	b	c	d	a	b	$c \oplus (a \oplus b)$	$d \oplus (a \& b)$
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	0
0	0	1	1	0	0	1	1
0	1	0	0	0	1	1	0
0	1	0	1	0	1	1	1
0	1	1	0	0	1	0	0
0	1	1	1	0	1	0	1
1	0	0	0	1	0	1	0
1	0	0	1	1	0	1	1
1	0	1	0	1	0	0	0
1	0	1	1	1	0	0	1
1	1	0	0	1	1	0	1
1	1	0	1	1	1	0	0
1	1	1	0	1	1	1	1
1	1	1	1	1	1	1	0

one-to-one

quantum-circuit:

