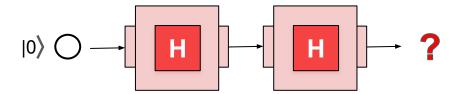
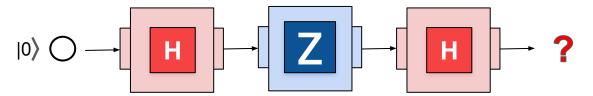
Homework: Reversibility and Ancilla

For each quantum circuit, choose the correct output.



a.
$$\begin{bmatrix} 1 \\ 0 \end{bmatrix}$$
b. $\frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ c. $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ d. $\frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ -1 \end{bmatrix}$

For each quantum circuit, choose the correct output.



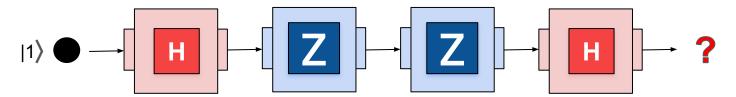
$$a. \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

b.
$$\frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$\begin{bmatrix} c. \\ 1 \end{bmatrix}$$

$$a. \begin{bmatrix} 1 \\ 0 \end{bmatrix} \qquad b. \ \frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ 1 \end{bmatrix} \qquad \begin{array}{c} c. \begin{bmatrix} 0 \\ 1 \end{bmatrix} \end{array} \qquad d. \ \frac{1}{\sqrt{2}} \begin{bmatrix} 1 \\ -1 \end{bmatrix}$$

For each quantum circuit, choose the correct output.



$$egin{array}{c} egin{array}{c} 1 \ 0 \end{array} & b. \; rac{1}{\sqrt{2}} egin{bmatrix} 1 \ 1 \end{array} & c. \; egin{bmatrix} 0 \ 1 \end{array} & d. \; rac{1}{\sqrt{2}} egin{bmatrix} 1 \ -1 \end{array} \end{array}$$

$$c.$$
 $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$

$$d. \,\, rac{1}{\sqrt{2}} egin{bmatrix} 1 \ -1 \end{bmatrix}$$

For each function below, choose whether it reversible or not reversible.

Input Bits			Output Bits		
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	1	1	1
0	1	1	1	1	1

NOT REVERSIBLE

Inp Bi		Output Bits		
0	0	0	0	
0	1	0	1	
1	0	1	1	
1	1	1	0	

REVERSIBLE