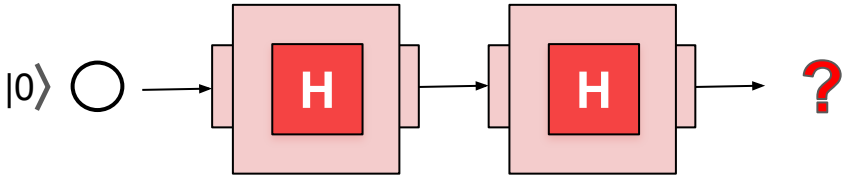
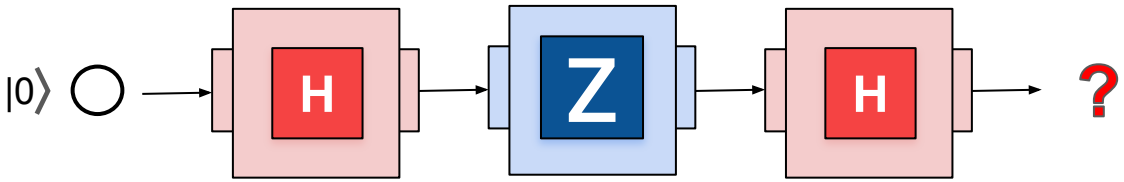
Homework: Reversibility and Ancilla

For each quantum circuit, choose the correct output.



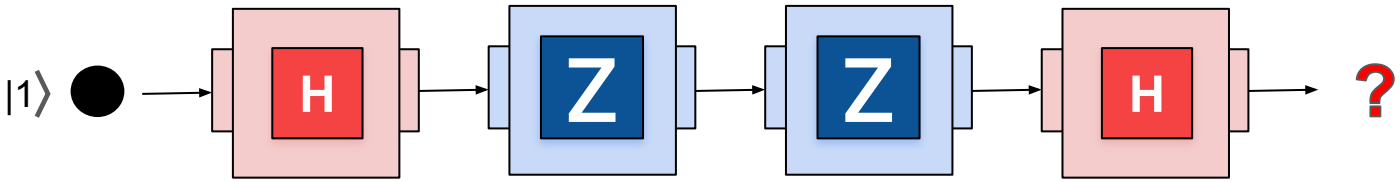
a. $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ b. $\frac{1}{\sqrt{2}}\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ c. $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ d. $\frac{1}{\sqrt{2}}\begin{bmatrix} 1 \\ -1 \end{bmatrix}$

For each quantum circuit, choose the correct output.



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

For each quantum circuit, choose the correct output.



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

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

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

REVERSIBLE