$$\left[egin{array}{cc} H=rac{1}{\sqrt{2}}egin{pmatrix}1&1\1&-1\end{pmatrix} \
ight]$$

Gates

$$\begin{bmatrix} CZ = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix} \end{bmatrix}$$

$$Z = egin{pmatrix} 1 & 0 \ 0 & -1 \end{pmatrix}$$

$$X = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$egin{bmatrix} CNOT = egin{pmatrix} 1 & 0 & 0 & 0 \ 0 & 1 & 0 & 0 \ 0 & 0 & 0 & 1 \ 0 & 0 & 1 & 0 \end{pmatrix} \ egin{pmatrix} 1 & 0 & 0 & 0 \ 0 & 1 & 0 & 1 \ 0 & 0 & 1 & 0 \end{pmatrix}$$