

Choose the correct result vector for the matrix multiplication problem.

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} 5 \\ 6 \end{bmatrix} = \begin{bmatrix} ? \\ ? \end{bmatrix}$$

a. $\begin{bmatrix} 8 \\ 13 \end{bmatrix}$

b. $\begin{bmatrix} 15 \\ 42 \end{bmatrix}$

c. $\begin{bmatrix} 17 \\ 39 \end{bmatrix}$

d. $\begin{bmatrix} 10 \\ 72 \end{bmatrix}$

Choose the correct result vector for the matrix multiplication problem.

$$\begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix} \begin{bmatrix} 2 \\ 4 \end{bmatrix} = \begin{bmatrix} ? \\ ? \end{bmatrix}$$

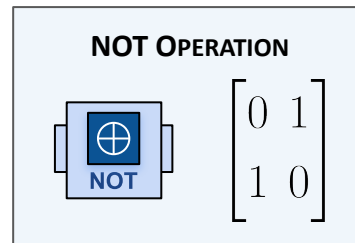
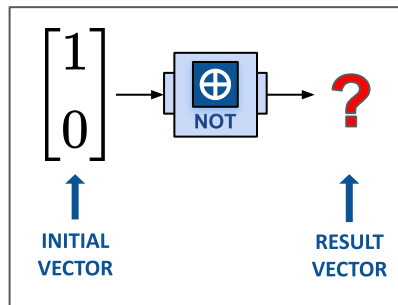
a. $\begin{bmatrix} 12 \\ 56 \end{bmatrix}$

b. $\begin{bmatrix} 8 \\ 18 \end{bmatrix}$

c. $\begin{bmatrix} 16 \\ 192 \end{bmatrix}$

d. $\begin{bmatrix} 20 \\ 44 \end{bmatrix}$

The NOT operation is applied to an initial vector, $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$.



What will the result be in vector notation?

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

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

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

d. Cannot be determined

What will the result be in bra-ket notation?

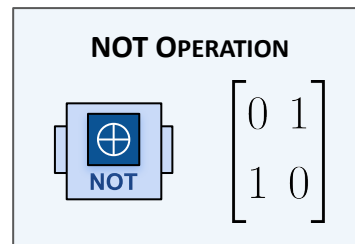
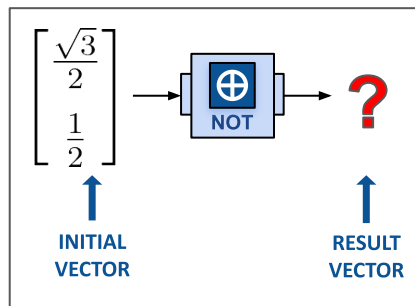
a. $|0\rangle$

b. $|1\rangle$

c. $\frac{1}{\sqrt{2}} |0\rangle + \frac{1}{\sqrt{2}} |1\rangle$

d. Cannot be determined

The NOT operation is applied to an initial vector: $\begin{bmatrix} \frac{\sqrt{3}}{2} \\ \frac{1}{2} \end{bmatrix}$.



What will the result be in vector notation?

a. $\begin{bmatrix} \frac{1}{2} \\ \frac{\sqrt{3}}{2} \end{bmatrix}$

b. $\begin{bmatrix} \frac{\sqrt{3}}{2} \\ \frac{1}{2} \end{bmatrix}$

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

d. Cannot be determined

What will the result be in bra-ket notation?

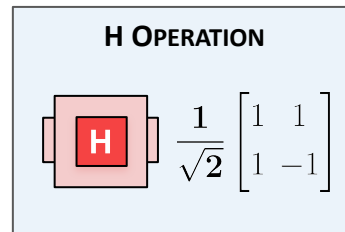
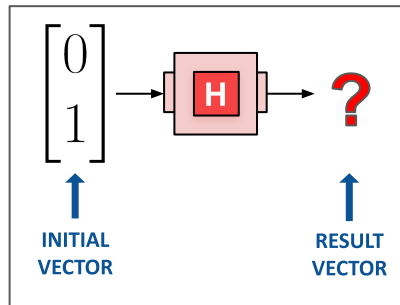
a. $\frac{\sqrt{3}}{2}|0\rangle + \frac{1}{2}|1\rangle$

b. $\frac{1}{2}|0\rangle + \frac{\sqrt{3}}{2}|1\rangle$

c. $\frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$

d. Cannot be determined

The H operation is applied to an initial vector: $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$.



What will the result be in vector notation?

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

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

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

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

What will the result be in bra-ket notation?

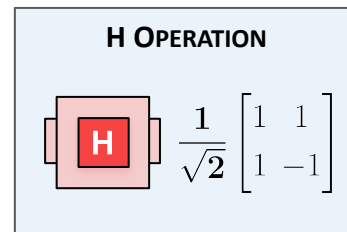
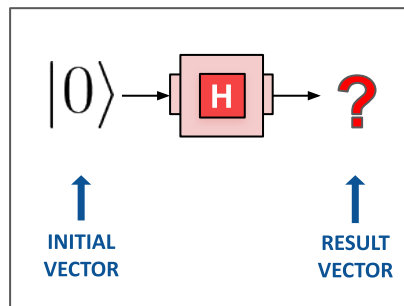
a. $\frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$

b. $\frac{2}{\sqrt{5}}|0\rangle + \frac{1}{\sqrt{5}}|1\rangle$

c. $\frac{1}{2}|0\rangle + \frac{\sqrt{3}}{2}|1\rangle$

d. $\frac{1}{\sqrt{2}}|0\rangle - \frac{1}{\sqrt{2}}|1\rangle$

The H operation is applied to an initial state: $|0\rangle$



What will the result be in vector notation?

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

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

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

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

What will the result be in bra-ket notation?

a. $\frac{2}{\sqrt{5}}|0\rangle + \frac{1}{\sqrt{5}}|1\rangle$

b. $\frac{1}{\sqrt{2}}|0\rangle + \frac{1}{\sqrt{2}}|1\rangle$

c. $\frac{1}{\sqrt{2}}|0\rangle - \frac{1}{\sqrt{2}}|1\rangle$

d. $\frac{1}{2}|0\rangle + \frac{\sqrt{3}}{2}|1\rangle$