

Operador Hadamard

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Definição

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- ▶ Na base computacional H é representado pela matriz

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

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Exemplo

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$$H(a|0\rangle + b|1\rangle) = a\left(\frac{|0\rangle + |1\rangle}{\sqrt{2}}\right) + b\left(\frac{|0\rangle - |1\rangle}{\sqrt{2}}\right) =$$

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Circuito

$$a|0\rangle + b|1\rangle \longrightarrow \boxed{H} \longrightarrow \frac{a+b}{\sqrt{2}}|0\rangle + \frac{a-b}{\sqrt{2}}|1\rangle$$

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Exemplo

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$$\frac{1}{\sqrt{2}} \left(\frac{|0\rangle + |1\rangle}{\sqrt{2}} + \frac{|0\rangle - |1\rangle}{\sqrt{2}} \right)$$

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Exemplo

$$\begin{aligned} H \cdot H |0\rangle &= H \left(\frac{1}{\sqrt{2}} (|0\rangle + |1\rangle) \right) = \\ \frac{1}{\sqrt{2}} \left(\frac{|0\rangle + |1\rangle}{\sqrt{2}} + \frac{|0\rangle - |1\rangle}{\sqrt{2}} \right) &= |0\rangle \end{aligned}$$