Quantum Gates

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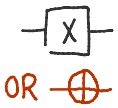
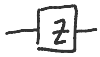
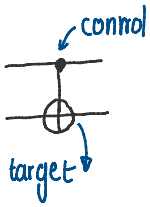
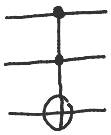
Operator Name	Symbol	Action	Description
Pauli-X		$\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$	Bit flip $X\|0\rangle = \|1\rangle$ $X\|1\rangle = \|0\rangle$
Pauli-Y		$\begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$	A combination of these two (plus an overall phase)
Pauli-Z		$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	Phase flip on $\|1\rangle$ $Z\|0\rangle = \|0\rangle$ $Z\|1\rangle = -\|1\rangle$
Hadamard		$\frac{1}{\sqrt{2}}\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}$	Creates superpositions. $H\|0\rangle = (\|0\rangle+\|1\rangle)/\sqrt{2}$ $H\|1\rangle = (\|0\rangle-\|1\rangle)/\sqrt{2}$
Controlled Not (CNOT) (CX)		$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$	$\|\text{target}\rangle \otimes \|\text{Control}\rangle$ If the control qubit is $\|0\rangle$ do nothing. If the control qubit is $\|1\rangle$ apply Pauli-X (NOT) gate to control qubit.
Swap Gate		$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	Swap the two qubits.
Tofilli Gate		???	If the two control qubits are both $\|1\rangle$, apply X gate. Else do nothing.

NOTE How IBM arrange their qubits is non-standard. i.e.