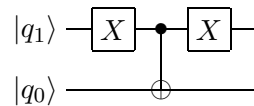
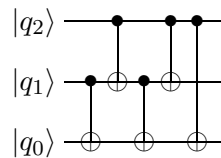


Quantum Computing Epiphany Assignment 2

1. Compute the action of the following circuit on the computational basis states. Give an equivalent circuit using a CNOT gate and a single NOT gate.



2. Compute the action of the following circuit on the computational basis states. Give a simpler equivalent circuit if possible.



3. Consider a two-qubit system. Construct a circuit to realise the operation $U = \begin{pmatrix} T & 0 \\ 0 & X \end{pmatrix}$, where T and X are the standard 2×2 matrices. You may use any single-qubit unitary gates and any controlled single-qubit unitary gates.