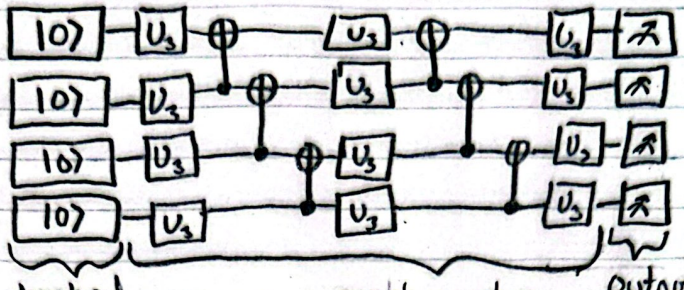
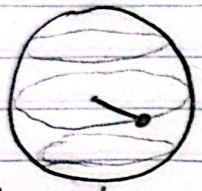
Quantum vs Classical



different operations like rotations

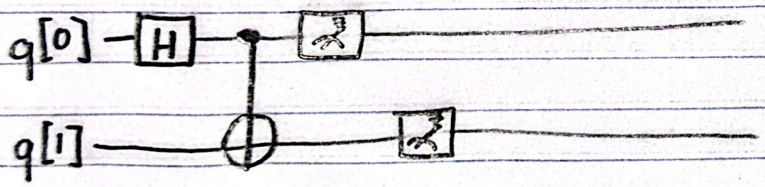


classical

quantum

5 qubit systems

First circuit - Bell State



$$\frac{|00\rangle + |11\rangle}{\sqrt{2}} \rightarrow \frac{|00\rangle + |10\rangle}{\sqrt{2}} \rightarrow \frac{|00\rangle + |11\rangle}{\sqrt{2}}$$

H creates superposition, $|0\rangle$ and $|1\rangle$ have equal combination, CNOT flips bit Superposition until measured, and since it is entangled, if one qubit is 0 then the other must be as well, Same if qubit is 1.

H - Hadamard gate rotates $|0\rangle$ and $|1\rangle$ to $|+\rangle$ and $|-\rangle$, useful for superpositions

⊕ - CNOT, performs a NOT when on the target when the control is $|1\rangle$. If the control is in a superposition, it creates entanglement

 - Measurement, non reversible