Here are some key points about quantum gates:

1. Basic Quantum Gates
   - Pauli-X Gate: Also known as the quantum NOT gate, it flips the state of a qubit from |0⟩ to |1⟩ and vice versa.
   - Pauli-Y Gate: Rotates the qubit state around the Y-axis of the Bloch sphere.
   - Pauli-Z Gate: Applies a phase flip to the qubit state, rotating it around the Z-axis.
2. Hadamard Gate (H Gate)
   - Creates a superposition state by transforming a qubit from |0⟩ to (|0⟩ + |1⟩)/√2 and from |1⟩ to (|0⟩ - |1⟩)/√2.
3. Phase Shift Gates
   - S Gate: Applies a 90-degree phase shift.
   - T Gate: Applies a 45-degree phase shift.
4. Controlled Gates
   - CNOT Gate (Controlled-NOT): Flips the state of a target qubit if the control qubit is in the state |1⟩.
   - Toffoli Gate (CCNOT): A three-qubit gate that flips the state of the target qubit if the two control qubits are in the state |1⟩.
5. Swap Gate
   - Swaps the states of two qubits.
6. Universal Quantum Gates
   - A set of gates that can be combined to perform any quantum computation. The Hadamard, Phase, and CNOT gates form a universal set.