Day3

QUANTUM COMPUTATION COMMUNITY
IISER-K

Topics we will be going through

- Superposition of State
- Measurement of State
- Linear Algebra and Gates
- Multiple Qubit State Representation
- Working with Superposition Qubit.

Superposition

- Superposition in simple term is multiple things at same time.
- Imaging a particle at multiple place at the same time.
- Or let's say a qubit in both |o> as well as |1> state at the same time.
- Quantum Superposition means a quantum particle can take multiple states at the same time.
- https://www.youtube.com/watch?v=mE1O61x6kos

Measurement

- When we measure a qubit it can collapse on either |0> or |1> state.
- A state |Psi> = x*|0>+y*|1>, has |x|^2 probability of collapsing in |0> state and |y|^2 probability of collapsing in |1> state.
- Imagin a coin, when it's spinning, we can say that it's in both head as well as tale state but when we stop and see if we got a head or tale that superposition collapses on either head or tale state.

Linear Algebra

- Transformation :- Vector Space to Vector Space
- Unitary Transformation
- Single Qubit Gates
- Playing with qubits

Multiple Qubit State Vector

- Tensor product
- Basis of Two qubit
- Two Qubit State Vector
- Multiple Qubit Gates
- N-Qubit State Vector
- Gates Composition into Matrix
- Playing with Qubits