CS 518 Quantum Networking and Security, Spring 2024

*Homework – 3*

* ***Read Sections 4.4, 4.5, 4.6 and 4.7- Parag Lala; all materials covered in the lectures***
* ***Read Section 3.11 (Identity Operator)***

1. Write is qubit? Point with arrows- the state of the qubit, probability of |0> state (logical basis state) and probability of |1> (logical basis state) in a general formula of single qubit.
2. Describe Qubit represented as Bloch Sphere with a diagram showing
   1. Ground state of qubit (North pole), excited state of qubit, intermediary state of qubit, and angles defining the vector of the intermediary state.
3. What is Quantum register? Write the expression for 3-qubit and 2-qubit registers.
4. What unique property that makes the quantum computing so special (describe with an example).

* **Research for the term paper (skim through the list of example projects and prepare initial topic idea)**