

# Notes of Preskill's Quantum Information Theory

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## Abstract

This is a note taken when I read the course notes of Preskill's course on quantum computation.

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## 1 Chapter 2 Foundations I: States and Ensembles

### 1.1 2.2 The Qubit

Here the concept of qubit is defined:

**Definition 1.1** (Qubit). *A qubit is a quantum system described by a two-dimensional Hilbert space.*

However, since measurement collapse the superposition state of quantum mechanics, there seems to be not difference between a qubit and a classical bit whose initial state is only known probabilistically. More important distinction should be and will be pointed out in the next few sections.

### Spin- $\frac{1}{2}$

## References

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