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**Feb 6, 2020**

**EE 5340**

**Part 1:**

Creating a qubit in the state :

* **state vector:**

[,1]

[1,] 1+0i

[2,] 0+0i

* **dirac representations:**

[1] "1|0>"

* **probability of measuring**

[1,] 1 🡪 has probability of 100%

[2,] 0 🡪 has probability of 0%

**Part 2:**

Performing an X gate to the qubit :

* **state vector:**

[,1]

[1,] 0+0i

[2,] 1+0i

* **dirac representations:**

[1] "1|1>"

* **probability of measuring**

[1,] 0 🡪 has probability of 0%

[2,] 1 🡪 has probability of 100%

The output resulted in performing an X gate to a single qubit is the state vector of the qubit are swiped. It is seen in part one and two as the probity of getting zero or one has been swiped.

**Part 3:**

**Creating a qubit in the state :**

* **state vector:**

[,1]

[1,] 0.8164966+0i

[2,] 0.5773503+0i

* **dirac representations:**

[1] "0.816|0> + 0.577|1>"

* **probability of measuring**

[1,] 0.6666667 🡪 has probability of 66.6%

[2,] 0.3333333 🡪 has probability of 33.3%

**Performing an X gate to the qubit**

* **state vector:**

[,1]

[1,] 0.5773503+0i

[2,] 0.8164966+0i

* **dirac representations:**

[1] "0.577|0> + 0.816|1>"

* **probability of measuring**

[1,] 0.3333333 🡪 has probability of 33.3%

[2,] 0.6666667 🡪 has probability of 66.6%