

1)Team Name : Qitcat

2)Participants:

Name : Niloy Kumar Mondal

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Job : Undergrad CSE student

Organization : [Bangladesh University of Engineering and Technology](#)

Role: Single Handedly solved every aspect of the problem

3) Qualification : Participated in various Hackathon like MIT iqHACK , Yale Quantum Hackathon

4)

a) High-level overview of your proposed solution

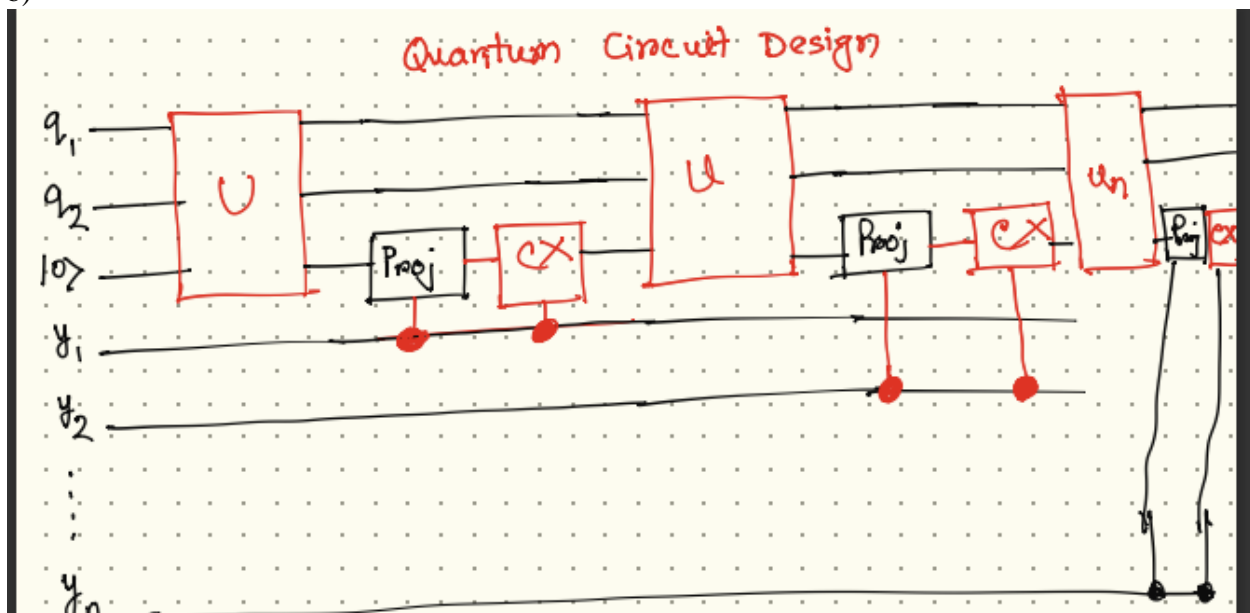
We will apply projection operation conditionally.

If  $y$  at  $i$ th step is known to be 0, we need states that has **last qubit as 0**, we will project third qubit on  $|0\rangle\langle 0|$ . Entanglement will help us discard the states with 1 as last qubit.

If  $y$  at  $i$ th step is known to be 1, we will project third qubit on  $|1\rangle\langle 1|$ . We now know all states has 1 as last qubit, we apply controlled X gate to reset it to 0, that **will not harm** the states of first two qubit.

**If we want to generalize, we can use I tensor I tensor (projection or CX).**

b)



Proj means controlled projection operator .Classical methods cannot simulate all possible state simultaneously.We can get **an exponential speed up**.

C)Industry impact :Computationlly fast,can **make descision quickly**,predict last state by easily **switching possible outcomes** at early states reducing complexity We can do **backward calculation** too.