

Design of Quantum Circuits for performing Arithmetic Operations (#17)

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Idea: To Construct Reversible Circuits

Goal:

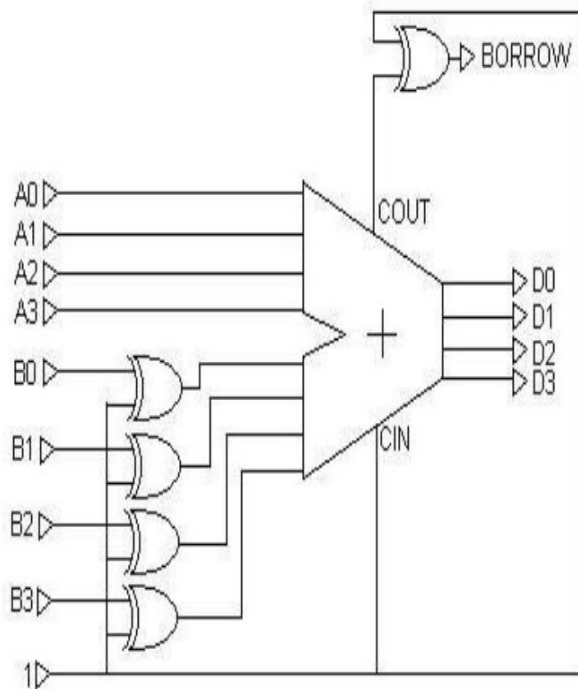
- *To construct/design reversible quantum circuits.*
- *Implement using Qiskit.*
- *Optimize the quantum circuit in terms of cost, depth, etc.*
- *To contribute the implemented idea as a Journal Paper.*

Problems Considered

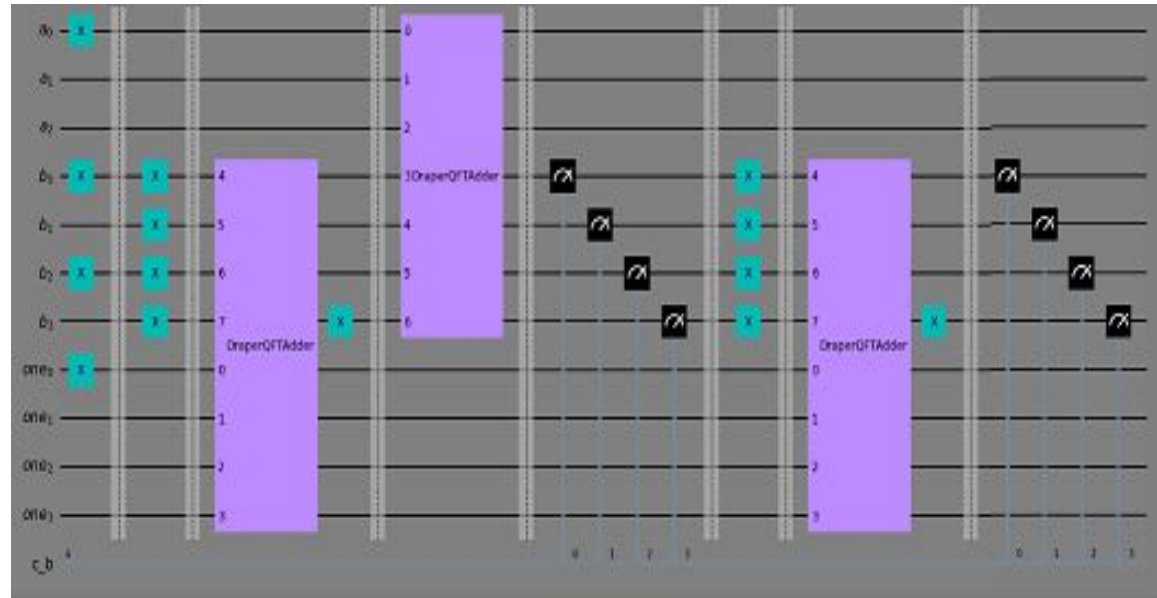
1. *Two's Complement Adder/Subtractor*
2. *BCD to Excess-3 Code Convertor*

Two's Complement Adder/Subtractor

Classical Circuit



Quantum Circuit

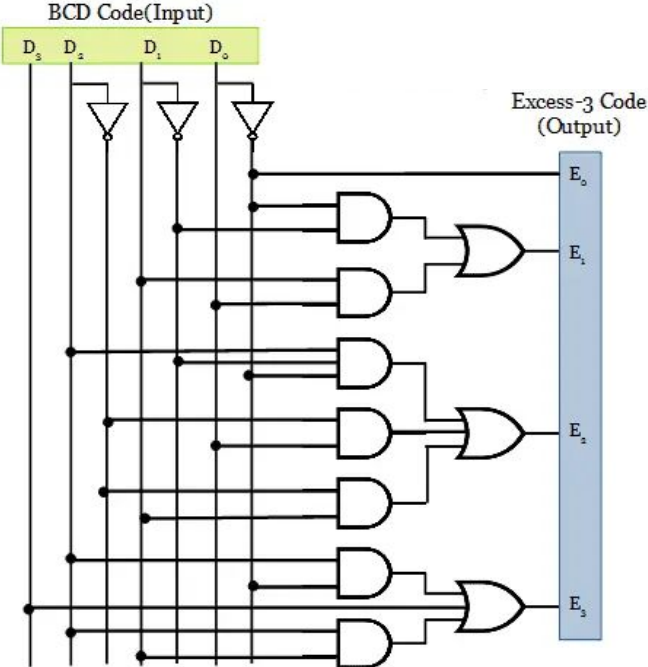


- `from qiskit.circuit.library import DraperQFTAdder`

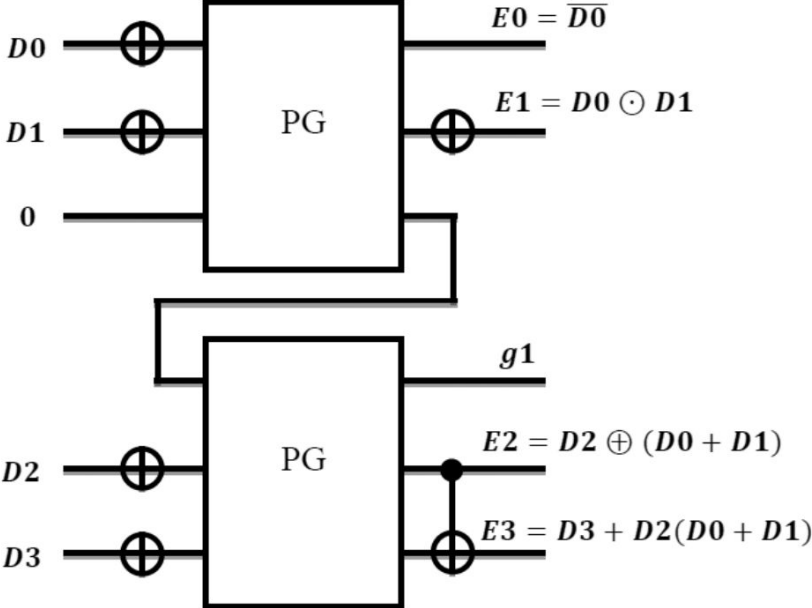
BCD to Excess-3 Code Converter



Classical Circuit



Quantum Circuit



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Future Work

1

Designing reversible circuits for many more logical circuits

2

Implementation of the reversible circuits using Qiskit

3

Optimize the quantum circuit

4

Publishing the results and contributing towards the Qiskit environment

Thank You!
