Quantum Computing

Solutions 3. Error Correction

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[1]:
```
from qutip import *
import numpy as np
```

Fault Tolerant Simple Gates

Consider the CNOT circuit.

Use a bit-flip code to create a fault-tolerant CNOT gate (against a single bit-flip).

Similarly, what would be a fault-tolerant H, X or Z gate be?

Solution

- Fault Tolerance CNOT circuit
- In the other cases: simply repeat the simple gate across all quantum wires for the code (warning, this does not apply for all gates - for non-Clifford group gates, additional ancilla qubits are required; well beyond what we have covered).

[ ]:
```

```