Clique Problem Report

Report generated on: 2025-09-07 14:31:51

Graph Details

Number of Nodes: 3
Edges of Nodes: [(0,1), (0,2)]

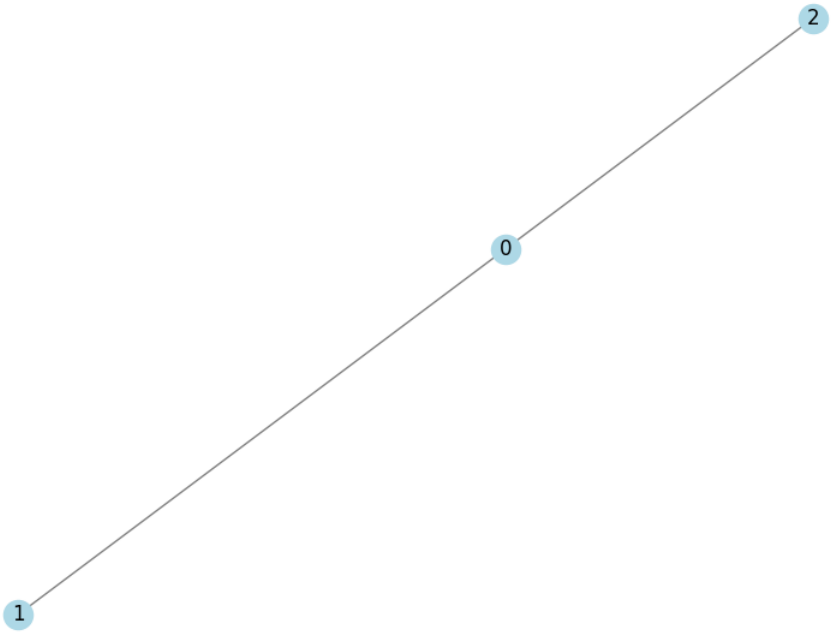

Figure 1: Graph Visualization

0.1 QUBO Matrix Visualization

Converted QUBO matrix visualization:

$$\begin{array}{ccc} -36.0 & 23.0 & 23.0 \\ 0.0 & -36.0 & 24.0 \\ 0.0 & 0.0 & -36.0 \end{array}$$

0.2 Oracle Visualization

The corresponding oracle for the Clique is shown below:
not implemented yet

QAOA Optimization Results

Most Probable Solution for QAOA:

- Variable x_1 is set to false
- Variable x_2 is set to true
- Variable x_3 is set to true

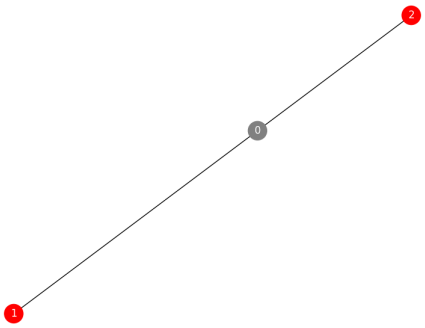

Figure 2: QAOA Result

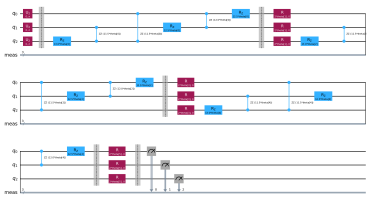

Figure 3: QAOA Quantum Circuit

VQE Optimization Results

Most Probable Solution for VQE:

- Variable x_1 is set to true
- Variable x_2 is set to true
- Variable x_3 is set to false

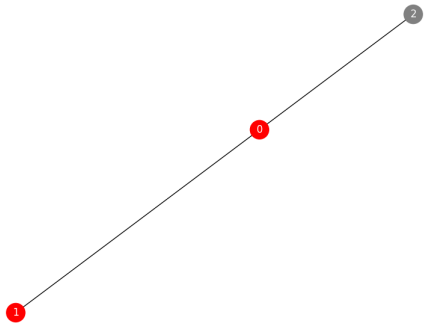

Figure 4: VQE Result

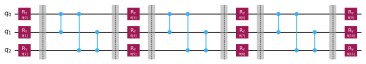

Figure 5: VQE Quantum Circuit

Grover's Algorithm Results

not implemented yet

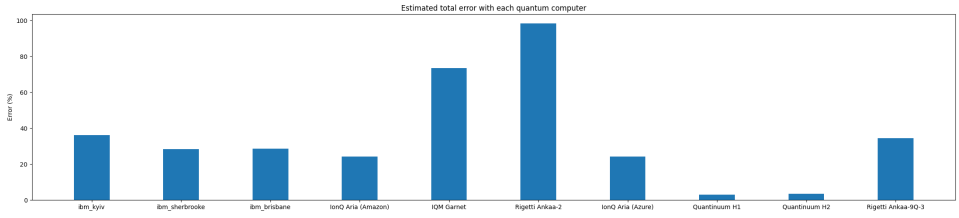

Figure 6: Estimated total error with each quantum computer

Device Recommendation Summary

\textbf{Here is the device recommendation summary based on error, time, and price:}\

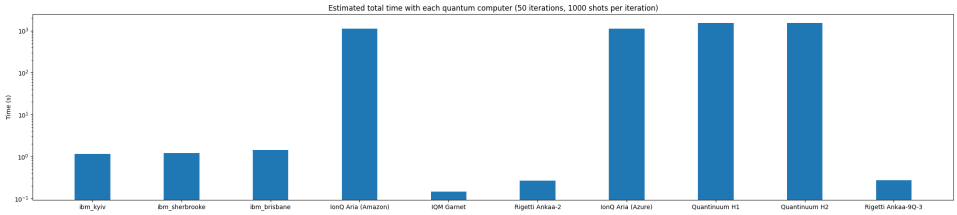

Figure 7: Estimated total time with each quantum computer

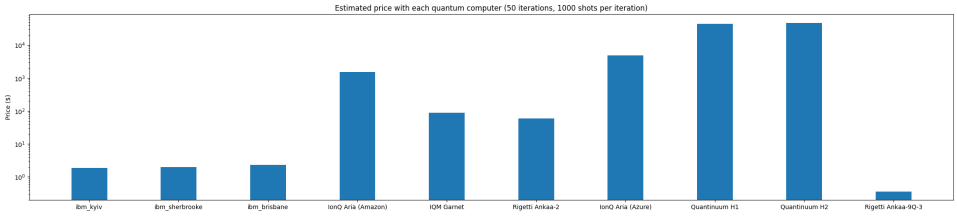

Figure 8: Estimated price with each quantum computer

- Lowest error: Quantinuum H1 from Azure Quantum with a calculated error of 2.96%, time to execute: 1544.4 seconds and a price of $44250.0.
- Lowest time: IQM Garnet from Amazon Braket with a calculated error of 73.41%, time to execute: 0.147 seconds and a price of $87.5.
- Lowest price: Rigetti Ankaa-9Q-3 from Azure Quantum with a calculated error of 34.33%, time to execute: 0.275 seconds and a price of $0.36.