Quantum Computing for K-12 with Blockly

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Last year, a VCU Capstone team worked on a project about Quantum Computing with Blockly to design a Tic-Tac-Toe game that would showcase the basics of computer programming to Students K-12 and help them gain a better understanding of the field to the point where they may want to pursue it. This year, our team's goal is to build upon that by refining the initial game, adding new games to play and adding multiple features like quantum cpu vs normal cpu opponents and difficulties. This is to showcase more complex Blockly coding to the students studying this game so they can see the different applications and uses quantum programming can have and to show how much you can do with it now and in the future.

Keywords:
- **QUBO -** *Quadratic Unconstrained Binary Optimization model. Mathematical model used to represent optimization problems as a quadratic function over binary variables. Model is solved by finding the most efficient solution to the problem though weights and constraints.*
- **Blockly -** *A block-based visual programming language made by Google. We use Blockly to generate the QUBO model used to make moves in the games.*