UR-350 Quantum Game Theory

INTRO/ABSTRACT

Quantum computing is a computing paradigm that utilizes the properties of quantum mechanics such as superposition, interface and entanglement for data processing and other tasks. Classical game theory is an extension of math that studies strategies of one or more participants. We review the performance of classical and quantum strategies on five classical games by analyzing the logic and outcomes of each approach. The five games chosen were coin-flip, prisoner's dilemma, Monty Hall, Tic-Tac-Toe, and Survival of the Fittest.

METHODS

Google Cirq and TensorFlow were utilized to develop programs that simulate quantum circuits for the five classical games that we researched. These programs allowed us to analyze the potential advantages of quantum game theory and demonstrate how quantum strategies could potentially improve the outcomes of these games.

RESULTS

We researched and found feasible solutions to three of the five games that can only be done through quantum mechanics. The solutions were found for the games coin-flip, prisoner's dilemma, and Monty Hall. We also provide reasonings as to why the other two games do not produce specific outcomes.

Quantum Game Theory How To Win A Coin Toss Everytime

Classical vs Quantum Game Theory

Strategy - Analysis - Outcomes

This barcode is a link to our website containing information on our research methods, technology used, and results

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