Alternative Dollar Auction Game: Modeling and Simulation Based on "Thirty-Six Stratagems" and Game Theory.

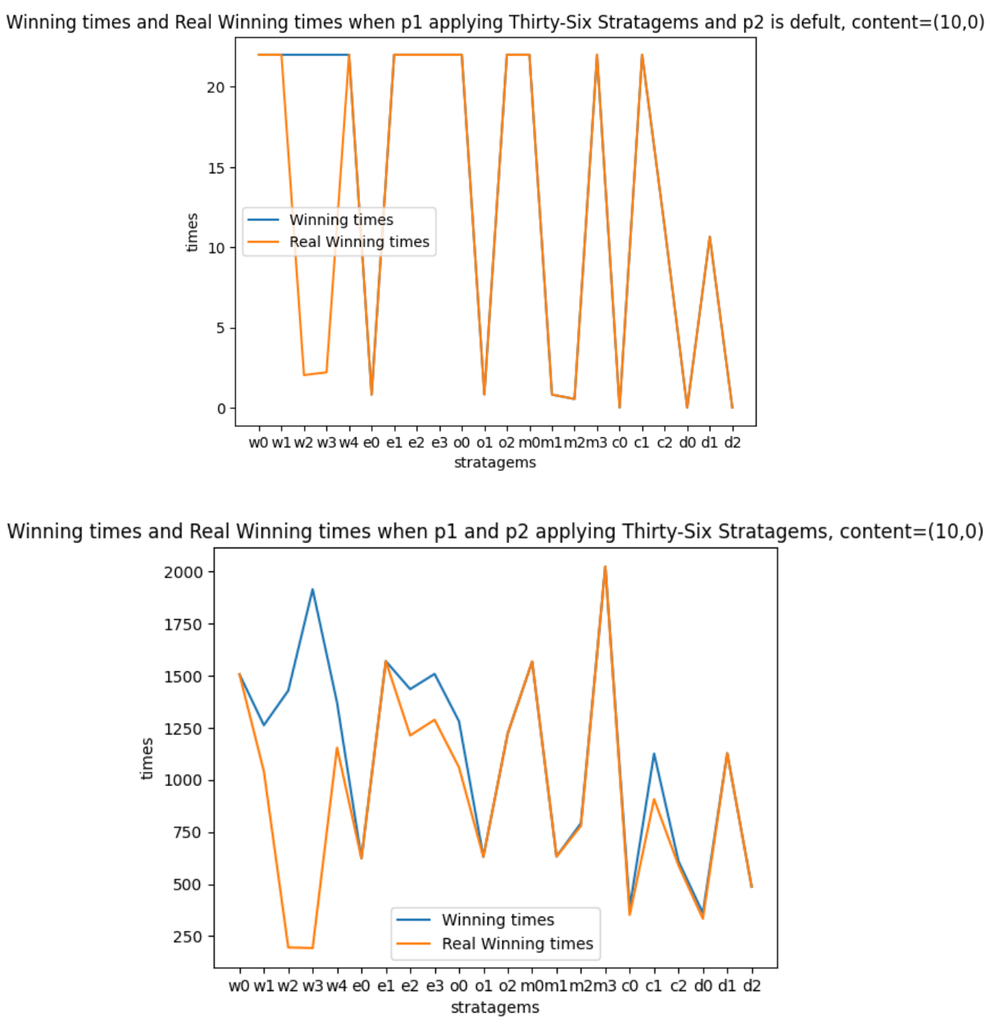
Yiwei Liang
yl834@duke.edu

昆山杜克大学
DUKE KUNSHAN UNIVERSITY

INTRODUCTION

Dollar Auction game is a non-zero-sum sequential game played by two or more bidders, with the objective of winning a dollar bill. In this project, develop a new tool to simulate the dollar auction game and change the original game into an alternative form. Consider the real-world application of Dollar Auction game, it usually explains the effects and consequences of sunk costs and costly competition. Applying this project, we have a more flexible Dollar Auction game environment to simulate more complex situations. At the same time, this project provides new solutions to decrease the probability and amount of lost money.

RESULT



METHODOLOGY

The code implements a game that involves two players (Player1 and Player2) competing against each other. The game progresses through multiple rounds, and the players make decisions regarding their moves, strategies, and payments.

Here is an overview of the methodology:

Class definitions:

Content: Represents the content of the game, including the goods available.

Player1: Represents Player 1 and contains attributes and methods related to Player 1's moves, strategies, and decisions.

Player2: Represents Player 2 and contains attributes and methods related to Player 2's moves, strategies, and decisions.

Game: Represents the game itself and coordinates the interactions between Player 1 and Player 2.

Game flow:

The game starts with the creation of Player 1 and Player 2 instances, along with the initialization of game-related variables.

Each round of the game consists of several steps, including players making moves, using stratagems, determining pay values, handling dependent moves, and updating money and goods.

The game determines the winner based on the players' money and keeps track of winning strategies and real winning statistics.

The game can involve human player interaction, allowing them to make decisions and input pay values for goods.

This methodology provides an overview of the game's structure, player interactions, and the progression of rounds. It outlines the key steps involved in each round and how the winner is determined based on player decisions and pay values.

REFERENCES

Li, LinWei. "Thirty-six stratagems and game theory." (2014).

Shubik, Martin. "The dollar auction game: A paradox in noncooperative behavior and escalation." *Journal of conflict Resolution* 15, no. 1 (1971): 109-111.

Taylor, Peter. The Thirty-Six Stratagems: A modern interpretation of a strategy classic. *Infinite Ideas*, 2013.