The Game of "Luck" Written Report

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Introduction

Our project is about investigating the board game, the Game of Life, to find out how luck based this board game is. In this project, we are calculating the chances of players landing on the different coloured spaces and the percentages of spinning the numbers 1-6 on the spin wheel, in order to find out the winning strategy for this game.

How to play?

The board game consists of:
- A Game Board
- A spin wheel with the numbers 1-6
- A deck of yellow cards
- 4 character pieces
- Game money

First, choose a route and then spin the wheel and move the amount of spaces shown. Depending on what colour space you land on(yellow, blue, red, green) do the action required(draw a card , take money from the bank, discard money) The aim of the game is to reach the end with the most money.

Mathematical Concepts

The project we are doing involves the concepts of:
- Percentage
- Probability

Research Question 1

Our first research question is " What are the chances of players landing on the different coloured spaces?" The way we calculated the percentages by playing 50 total games and tallied up the total times that the player landed on the

spaces(eg. Yellow, Purple) and the total number of spaces that the player landed on. Using this, we calculated that the player landed on:

- **Yellow Spaces: 83% of the time**
- **Purple Spaces: 6.4% of the time**
- **Blue Spaces: 6.4% of the time**
- **Green Spaces: 4.2% of the time**

Research Question 2:

Our second research question is " What are the chances of spinning the numbers 1 to 6 on the spin wheel?" The way we calculated the percentages is during our 50 games, we count the number of times the player spun the wheel and the number of times the player spun the numbers 1,2,3,4,5 and 6. Using this method, we calculated that the percentage of spinning the 6 number is:

- **1: 16%**
- **2: 14%**
- **3: 10%**
- **4: 16%**
- **5: 23%**
- **6: 21%**

Research Question 3:

Our third and final research question is "What is the strategy of winning the game?" The way we found the answer to this question is to calculate the win rate of the players (group members), for example , player A won **40%** of the games (20 out of 50 games) and player B won **60%** of the games(30 out of 50 games). Based on the routes each player took, we deduced that taking the second route which B took was more effective. The reason behind this is that the second route had more green spaces and blue spaces giving the player money. But the 20 times that B lost was when he lost money to the purple squares , while A gained money from the green squares and finished first.

Conclusion:
For this project, our main aim was to find out how luck-based The Game of Life was , while also attempting to find out the winning strategy for this game. Through our investigations, we have concluded that the winning strategy is to

take the second route and attempt not to land on the purple spaces while finishing last so that the player can land on more green and blue spaces to maximise the income the player gets. Base on this conclusion, there is a moderate amount of luck involved as the players have to avoid the purple spaces which is not possible unless the player gets lucky, and he has to try to spin low numbers and based on research question 2, the percentage of spinning the higher number 4,5 and 6 is higher than 50% chance. Hence, luck is involved when trying to spin lower numbers.