A popular board game since 1935, Monopoly is a game that may be dependent on both luck and strategy. A player can bet on his or her own luck alone, think carefully and buy up strategic properties, or use strategy to complement his or her luck to gain dominance in the game. Our report seeks to present our findings on the importance of strategy in Monopoly, as well as which strategies are the most successful. So is Monopoly a game of strategy, or luck, or both?

Our methodology involved examining the inter-relationships between the various factors in the game, for example, the throw of the 2 dice, the number of throws that a player has played, the number of rounds he is in, accounting for jail and rent etc. After establishing the inter-relations, we built up our model by gradually adding more factors (which increase uncertainty) that affect the game, and thereby incorporated more realism into the model. We thus proceeded to build 3 main models, by using dynamic equations. First we used the propagation of probability flow method to determine the chances of landing on a particular square in a given number of throws (Model 1). Next, we included regeneration points in the case where jail is considered (Model 2). Lastly, from the probability flow sequences obtained, we calculated the expected value of landing on each square on the board, taking into account the rents paid and $200 that a player gets each time after he passes a round, to analyze the wealth effect when multiple players are involved (Model 3).

To aid our analysis, we made several assumptions in the building of our models. We do not include the cards aspect of the game because we assumed that the effect of the community and chest cards on the players is random and everyone is subject to the same probability of getting a card. Hence, this will not be consequential to our proposed strategies. Also, to facilitate the analysis of the wealth effect on the players, we assumed that each player owns a particular color set of properties from the start of the game, and that they buy up houses at given intervals in the game.

Our findings showed that Light Blue had the highest probability of being landed on in Model 1. However, after the effect of jail was considered in Model 2, Orange had the highest probability of being landed on. This advantage had little effect on the expected earnings that Orange had compared with the other colors. Choosing a set of 4 colors (Yellow, Light Blue, Orange, Dark Blue) because of particular characteristics that these colors have, and assuming that each player owns a color from the start, we examined the expected earnings that each player has as the game progresses in Model 3. We see that even though Orange and Light Blue have the highest probabilities of being landed on, their expected earnings in the long run are not the highest as they do not collect as much money in rent. Despite the low short-term probabilities of being landed on, Yellow and Green actually have high expected earnings in the long-run. This leads us to believe that the expected earning of a player is influenced more by the amount of rent the property collects rather than the probabilities of landing on that property.

In conclusion, we see that there are differences in expected payoffs associated with different color sets, and thus a certain amount of strategy would be useful for winning the game even though Monopoly is a game with a fair amount of uncertainties. Therefore, assuming that a regular game would last more than approximately 30 throws, we recommend that the player focuses his efforts on buying Yellow and Green to maximize his chances of winning. Because we excluded the effect of community and chest cards, and the possibility that the players may collude, from our analysis, we need to recognize that these factors add additional uncertainties into the model, which means that Monopoly cannot just be a game of only strategy. Monopoly is thus a game of both strategy and luck.