**Abstract and Motivation**

Objective:

Maximize profit while maintaining high customer satisfaction in a theme park

Variables:

* Combination and configuration of attractions
* Attractions have different capacities and durations

Method used:

* Agent-based modelling will be used to simulate the behaviour of individual agents and their interactions with the environment. This could mean simulating the behaviour of visitors within each attraction, including how they interact with the attractions and how they may influence the behaviour of other visitors.
* Each agent’s satisfaction score will be computed in consideration of popularity of rides taken, total number of rides taken, and negative relationship with customer waiting time.

Metrics computed:

* Average queue length
* Average waiting time per customer
* Average profits per customer

Analysis:

* Explore different combinations of attraction types to find out how different theme park configurations could affect profit and visitors’ satisfaction.
* Output analysis: Welch’s method will be used for eliminating initialisation bias, and constructing paired-t confidence intervals for differences in the performance of different theme park configurations.

Abstract:

This theme park simulation project aims to maximize profit while maintaining high customer satisfaction. The project will utilize agent-based modeling to simulate the behavior of individual visitors within the theme park and their interactions with the attractions. The project will explore different combinations and configurations of attractions to determine how they affect profit and visitor satisfaction. Metrics such as average queue length, average waiting time per customer, and average profits per customer will be computed to evaluate the performance of the theme park simulation. Welch's method will be used to eliminate initialization bias and construct paired-t confidence intervals for differences in the performance of different theme park configurations.

Motivation:

When this project was launched, we decided to do a theme-park-related simulation when we thought of Uncle Ringo. Uncle Ringo has been a well-known and trusted name in Singapore since 1984, offering a wide range of carnival and family entertainment services. With a long-standing history of organizing events such as carnivals, fun fairs, theme parties, product launches, fundraising charities, and school events, Uncle Ringo is recognised as one of Singapore's leading providers of these services. Because of Uncle Ringo, we thought it would be interesting to analyse the operations of a theme park and their implications on customer satisfaction.