**IEOR 24: Introduction to Industrial Engineering and Operations Research**

**Professor Goldberg**

**Notes on week 2 by Ahmed Osman**

**Ride Max:**

* Product that help you organize your day on rides to avoid as much queue as possible
* Helps with scheduling to make the day as efficient as possible.
* Optimization problem.

***Why is IEOR Important?***

* It provides tools and techniques for modeling and optimizing the real world problem.

**Travelling Salesman problem**

Finding the shortest cycle through 10 points.

* To solve:
  + *By brute force*-time is a huge factor (combinatorial Explosion)

**Mathematical Programming**

A tool to find the optimal solution that requires a decision about how to use a limited set of resources.

Steps:

* Problem? What is needed? Goal or objective?
* Variables and Parameters
* Constraints/Obstacles
* Assumptions-to simplify model.
* Convert problem to mathematical model
* Explore different solutions
* Find optimal solution
* Check for sensitivity of solution to changes.

**Linear Programming is also used**

**Example:**

*Goal:* **Minimizing wait time and maximizing the number of rides.**

*Variables:* ***no of rides available, no of people at park, time of arrival and departure from park etc***

*Constraints:* **time lag due to maintenance, lunch break, reluctant of people, park capacity etc…**

*Assumptions:* **average time for lunch break, average no. of rides per person, no of times a person will go on 1 ride, time delay between rides to rest. Etc…**