Part 1 - Metrics design (30 points)

The Operation's Research team has developed a new optimization model to encourage couriers to move from certain zone to another in a specific time of the day, for each one of the cities. The objective of this model is to better allocate couriers and maximize the chance that there is an available courier for each one of the orders created by the app users. One of the main challenges in this problem is that a courier is free to move anywhere he likes, so the team needs to be creative in the incentives that they give to couriers to encourage them to move to different zones.

This project represents a milestone in Rappi, and the team is sure it will help to have an efficient operation that improves the user experience.

1. What do you think are the main variables that the team used, studied or took into account when developing this optimization model?

-Orders taken
-Number of curriers by zone
-Orders time
-Revenue

2. Propose and define the primary success metric for measuring the impact of the optimization model in Rappi's operation. What are 2-3 additional tracking metrics that would be important to monitor (in addition to the primary success metric defined above)? Why?

1. Increase in the orders taken rate for zone, this is the company main goal.
2. Number of couriers by zone(curries density), the distribution must be related with the demand for orders by zone.
3. Orders time and revenue, this factors could be important for the couriers when choosing the zone to move. The relation of both factors gives the couriers their working time value.

3. Outline a testing plan for evaluating if the performance of Rappi improved after deploying the model (according to the metrics you outlined). How would you balance the need to deliver quick results, with statistical rigor, while still monitoring for risks?

The test plan would be guided by three main factors, first the duration, in this case it could be one week since the objective is to increase the rate of orders received for all areas through a better allocation of couriers, at a specific time of the day, a week could give us enough time to see the evolution. The second factor should be the evolution of our primary success metric, previously establishing what would be a critical behavior of this factor gives us a test limit and prevent to put the operation in risk. The third factor is our a priori assumption, in this case could be that better working time value incentives determine what zone the couriers will choose.

4. Explain how you would translate the results from the testing plan into a decision on whether to keep the model or roll it back.

For keeping the model, our success metric should have a satisfactory behavior. In other words, an increase in the orders taken rate for all zones must be easily demonstrated. Given our week duration test, our metric should improve along the week test and with other weeks of the month.