Ultimate Take Home Challenge

Part 2: Experiment and Metrics

Key Success Metric

The number of trips completed between the two cities by each driver

Proposed Design

We believe that a matched-pair design is appropriate for the purpose of this study. Obtaining two independent samples of drivers (samples with different individuals) might still work. However, we need to make sure that the groups are homogenous in terms of the characteristics that the subjects have.

Design Protocol (Paired Design)

1. Obtain the past data that includes the number of trips completed between two cities by each driver
2. Collect the data on the number of trips completed by each driver between two cities AFTER they started reimbursing the drivers for the toll bridge.
3. Perform a hypothesis test that compares the average number of trips completed between the cities by each driver.

Test Statistic

Depending on the sample size, we can decide what test statistics to use for the test. If the sample size is sufficiently large (above 30) we can use t-test statistic. For small sample sizes, we can use non-parametric test statistics.

Interpretation

In the case, there is no significant difference between the average number of trips before and after reimbursement, the company can conclude that the reimbursement is not encouraging the drivers to make trips between Gotham and Metropolis. However, one should be careful with this interpretation as the sample size might be the problem. Therefore, the company should increase the sample size if possible.