

## ULTIMATE CHALLENGE PART 2 REPORT

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- (1) The key measure for success would be if the average revenue per driver generated by the trial group is greater than that of the control group, and that this difference is statistically significant. An alternative measure would be average number of riders per driver since increasing the number of users can mean increased revenue in the future.
- (2) An experiment to measure the effectiveness would be to take two groups of  $n$  drivers and set one to be the trial group and one to be the control group.
  - (a) Practical implementation: the trial group would be offered the toll reimbursement, and the control group would not be. Then the revenue generated by each driver would be recorded over a period of  $m$  days. At the end of the trial period, the revenues generated by each group will be compared.
  - (b) Statistical test: we would use A/B testing to determine if the difference in revenues is statistically significant. In particular, we would use Welch's  $t$ -test to determine if the difference between the average revenues of the two groups is statistically significant. This can be implemented in Python with `scipy.stats.ttest_ind`.
  - (c) If the trial group returns a significantly larger average revenue, then this reimbursement program should be offered to all drivers across the region. The rollout of this program should be monitored for unforeseen side effects such as changes in traffic patterns. The company could also consider brokering a deal with the toll bridge authorities to offer a reduced fee or some system by which the company is directly billed for ride-share tolls further encouraging drivers to take advantage of the program.