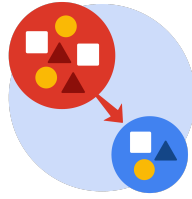


Course Four

From Data to Insight: The Power of Statistics



Instructions

Use this PACE strategy document to record decisions and reflections as you work through this end-of-course project. As a reminder, this document is a resource that you can reference in the future, and a guide to help you consider responses and reflections posed at various points throughout projects.

Course Project Recap

Regardless of which track you have chosen to complete, your goals for this project are:

- ☐ Complete the questions in the Course 4 PACE strategy document
- ☐ Answer the questions in the Jupyter notebook project file
- ☐ Compute descriptive statistics
- ☐ Conduct a hypothesis test
- ☐ Create an executive summary for external stakeholders

Relevant Interview Questions

Completing this end-of-course project will empower you to respond to the following interview topics:

- How would you explain an A/B test to stakeholders who may not be familiar with analytics?
- If you had access to company performance data, what statistical tests might be useful to help understand performance?
- What considerations would you think about when presenting results to make sure they have an impact or have achieved the desired results?
- What are some effective ways to communicate statistical concepts/methods to a non-technical audience?
- In your own words, explain the factors that go into an experimental design for designs such as A/B tests.



Reference Guide

This project has four tasks; the visual below identifies how the stages of PACE are incorporated across those tasks.



Data Project Questions & Considerations



PACE: Plan Stage

- What is the main purpose of this project?

The main purpose of this project was to determine if there was a statistically significant relationship between the payment type customers used and the fare amount they paid. This relationship allow TLC to maximize the money earned by the payment type with the highest fare amount.

- What is your research question for this project?

Is there a statistically significant relationship between the payment type and fare amount?

- What is the importance of random sampling?

Random sampling ensures that bias is reduced in selecting samples and that one group is not overrepresented in the statistical analysis.

- Give an example of sampling bias that might occur if you didn't use random sampling.

Selection bias might occur where the sample is not representative of the population.



PACE: Analyze & Construct Stages

- In general, why are descriptive statistics useful?

Descriptive statistics provide information on the location of the data and the shape of its distribution.

- How did computing descriptive statistics help you analyze your data?

Computing descriptive statistics allows for visualizations of data relationships and reveals outliers.

- In hypothesis testing, what is the difference between the null hypothesis and the alternative hypothesis?

The null hypothesis states that the results of a test are due to chance. The alternative hypothesis claims the results of a test are significant.

- How did you formulate your null hypothesis and alternative hypothesis?

For the payment type on fare amount question, it was observed that credit card users paid a higher fare amount on average than cash users. The null hypothesis stated that the fare amount paid between credit card and cash users was equal. The alternative hypothesis stated that the fare amount for credit card users was higher than that for cash users.

- What conclusion can be drawn from the hypothesis test?

After performing the hypothesis test, the p-value found using a two-sample t-test was found to be smaller than the significance level of 5%. The null hypothesis was rejected.



PACe: Execute Stage

- What key business or organizational insight(s) emerged from your A/B test?

The average fare amount paid by credit card users was significantly higher than that of cash users.

- What recommendations do you propose based on your results?

It would be recommended for TLC to opt for its taxicab drivers to use credit card payments over cash payments to increase the fare amount paid by the customer.