

# PACE Strategy Document

## Introduction

This PACE strategy document can be used to record decisions and reflections as you work through this end-of-course project. You can use this document as a guide to consider your responses and reflections at different stages of the data analytical process. Additionally, the PACE strategy documents can be used as a resource when working on future projects.

## 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?

To estimate fares for taxis before the ride is started. In this phase, statistical tests like A/B testing would be performed and hypothesis testing would be done. The aim of A/B testing is to find ways to generate more revenue from customers.

- What is your research question for this project?

Is there a relationship between fare amount and payment type? Is the hypothesis that the customers who use a credit card pay higher fare amounts than those who use cash true? Is the difference in payment statistically significant?

- What is the importance of random sampling?

Random sampling ensures that each entity in a population has an equal chance of getting picked and thus ensures that the sample represents the whole population and isn't biased.

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

When a teacher is analyzed only based on the marks of the toppers.



### PACE: Analyze & Construct Stages

- In general, why are descriptive statistics useful?

They represent the whole population by usually a single number from which it is much easier and faster to make decisions rather analyzing every single element of a population.

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

They help in arriving at decisions by using lesser resources and lesser time.



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

Null assumes equality while alternative assumes inequality. They are usually opposite to each other. Null states observed difference from standard value is due to chance while Alternative states that the difference is statistically significant and is not due to chance.

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

They are mutually exclusive. Null hypothesis usually assumes some quantity is equal to a value or a quantity of two different subsets are same. Alternative is usually defined as not null.

- What conclusion can be drawn from the hypothesis test?

That whether we can reject or fail to reject the null hypothesis.



### **PACE: Execute Stage**

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

Based on the result of my hypothesis test, I can say that the difference in averages of total fares for credit card and cash payments is statistically significant and might be causal. That is, it might be due to a relationship between total fare and credit card payments. Also, the hypothesis that customers who pay with credit card pay more is true.

But there is a problem with this A/B test. For the data collected, tips paid by cash are not included but those by credit cards are included.

But from the 2nd A/B test where tip amounts were excluded from total amount, we still saw a significant difference of \$1.5 more in credit card payments than cash payments.

Thus, credit card payments should be encouraged. Strategies should be created to promote credit card payments.

- What recommendations do you propose based on your results?

Credit card payments should be encouraged. Strategies should be created to promote credit card payments. For example, the New York City TLC can install signs that read "Credit card payments are preferred" in their cabs and implement a protocol that requires cab drivers to verbally inform customers that credit card payments are preferred. Another recommendation is to request data for cash tips if available.