Below we have a series of questions for you to translate into a technical plan. For each question, describe how you would make it testable and translate it from a general question into something statistically rigorous. Write your answers down in a shareable document and submit the link below.

1. You work at an e-commerce company that sells three goods: widgets, doodads, and fizzbangs. The head of advertising asks you which they should feature in their new advertising campaign. You have data on individual visitors' sessions (activity on a website, pageviews, and purchases, as well as if those users converted from an advertisement for that session. You also have the cost and price information for the goods.
   a. Which popular product, as measured by pageview data, has the highest advertising conversion rate? Analyze advertising conversion data to see which products have the highest rate. Compare this with web activity data to see if the advertised items are the same ones with the highest web activity. If not, this points to a product likely to give a good ROI from an advertising investment.
2. You work at a web design company that offers to build websites for clients. Signups have slowed, and you are tasked with finding out why. The onboarding funnel has three steps: email and password signup, plan choice, and payment. On a user level you have information on what steps they have completed as well as timestamps for all of those events for the past 3 years. You also have information on marketing spend on a weekly level.
   a. What correlation exists between weekly marketing spend and successful client conversion? Develop a model of the successful client signup by characterizing time intervals between steps for all successful users. Compare this to unsuccessful signups to determine failure patterns. Correlate this information with marketing effects by investigating any correlation between weekly marketing spend and weekly signup numbers.
3. You work at a hotel website and currently the website ranks search results by price. For simplicity's sake, let's say it's a website for one city with 100 hotels. You are tasked with proposing a better ranking system. You have session information, price information for the hotels, and whether each hotel is currently available.

a. What is a more effective ranking system as measured by session time? Rank hotels by price and availability so as to minimize time from initial browsing to booking.

4. You work at a social network, and the management is worried about churn (users stopping using the product). You are tasked with finding out if their churn is atypical. You have three years of data for users with an entry for every time they've logged in, including the timestamp and length of session.

a. What is typical churn time for a user? Compute mean time between visits over time for each user. Search for patterns in use to come up with a model of typical use to compare with more recent user base.

Discuss your answers to each of these questions with your mentor during your next session.