**Drill: What can data science do?**

**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 whether or not those users converted from an advertisement for that session. You also have the cost and price information for the goods.**

Looking at the information, it is tempting to instantly suggest a product that is in demand. But it makes more sense to analyze the products in previous ads and make a choice.

1. Verify the percentage of visitors that got converted from viewing an advertisement and then check for a product that is in demand for turning a visitor to a potential customer.

2. Check how purchasing trends have changed for each product over time and as the price of the product has changed. If there is a relation between price and demand of the products, consider data from the latest price change and find out which product is in demand now. If there is no relation, look for the best-selling product.

Taking percentages from 1 and 2, evaluate the product in highest demand for the new advertising campaign.

**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.**

Determine the trend on signups using weekly marketing information.

Using the timestamp, find out if there are any specific timeframes where clients are finishing up steps 2 and 3. Check if those timeframes are related to better pricing periods from marketing. (for example: a specific plan has been offered for a better rate and clients have signed up during that period). If this holds true, then efficient marketing is the key. If not, check if marketing is making an impact by looking at signups every week and how it changed over time.

**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.**

Identify the demand for each hotel by verifying the session information (number of times each hotel has been booked). Check for specific variables that are putting those hotels in demand. They could be price, location, availability etc. Rank the hotels based on those metrics.

**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.**

Note the logging patterns for each user by checking their session length and log in count per week (or month). Group the users into high, medium and low engagement users. Now verify how many users have left or discontinued using from each group.

Check for outliers (atypical users) and calculate their churn rate.

Comparing the regular users from the above 3 groups with outliers will give us if the churn is atypical or not.