**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](https://en.wikipedia.org/wiki/Session_%28web_analytics%29), [pageviews](https://en.wikipedia.org/wiki/Page_view), and purchases), as well as whether or not those users [converted](https://en.wikipedia.org/wiki/Conversion_marketing) from an advertisement for that session. You also have the cost and price information for the goods.

Assuming that the aim of the ad is to maximize profits, it is first important to figure out which ad attracted the most people to come to the website and buy a product.

These questions would lead my analysis:

Which ad was most successful on bringing people to the website?

Which ad let to the highest amount purchases in the past?

What did people visiting the website from the add buy?

1. 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](https://en.wikipedia.org/wiki/Funnel_analysis) 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](https://en.wikipedia.org/wiki/Marketing_spending) on a weekly level.

Main question: Why are signups going down? Is there a connection between the marketing spending and the reduced customer signups?

In order to answers the main questions, I would analyze the market spending over the last 3 years and compare it to the signups for different plans in the same timeframe.

A hypothesis to test would be, if when signups decline, marketing spendings had been reduced, too. Next, I would compare how the spending in marketing correlate with the sign ups grouped by different payment plan. If there is no connection between market spending and decline in signups, I would look for the timepoint when signups started to decline and look for seasonal patterns in customer behavior.

If there is a certain timepoint when customer signups started to decrease, I would try to figure out, what had happened during that time. Was there a launch of a competitor? A social/political or other event, that could explain change in customer behavior? Change in the website? Is something not working? If something is not working, this might be also obvious from analyzing the progress that people have made building their website.

1. 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.

From the session information, I would compare which filters people apply most. By adjusting filters, so that the majority of customers, will find the best hits already on top of the list, will certainly help them make faster choices.

Further, I would compare which hotels people booked, I would look at variables like availability, location (maybe there are certain areas that are more popular than others) and customer spending.

1. You work at a social network, and the management is worried about [churn](https://en.wikipedia.org/wiki/Churn_rate) (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.

I am assuming the following definition for my answer: A typical churn is preceded by a time period with reduced use of the website, meaning fewer logins and shorter length of session. An atypical churn would be if someone stops using the network without this period of reduced use.

A comparison of the customer cycles would be my first analysis. I would try to correlate customer cycles with events that could have triggered atypical churns. Maybe a competitor launched a similar website. Maybe the behavior can be explained by a change in the functionality of the website? Maybe it is correlated with bad press release that harmed the reputation of the company?