Advanced A/B Testing

Introduction

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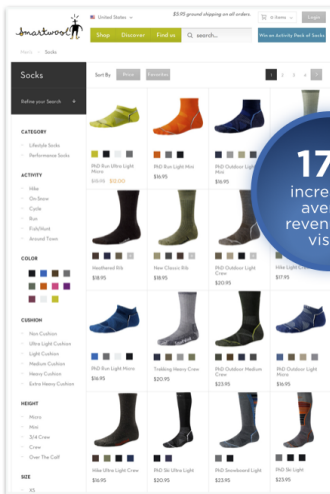6/16/2019

A/B Testing

50% visitors
see variation A

50% visitors
see variation B

vs

21%
conversion

38%
conversion

Source: splitmetrics.com

Example A/B test

Control

Variation

17% increase in average revenue per visitor

1. Randomly assign customers to treatments

Why A/B tests work

By **randomizing** over a large number of customers, we create groups that are the same, on average.

Any behavioral differences between these groups is **caused by the treatments** we randomly assigned.

1, 2, 3. Repeat with me. Randomization will set you free.

Workshop plan

- ▶ Test Analysis Basics
    - ▶ Randomization checks
    - ▶ Analysis
    - ▶ Sample size planning
- ▶ When your sample size is big
    - ▶ Slice and dice
    - ▶ Uplift modeling
    - ▶ Causal forests
- ▶ When your sample size is small
    - ▶ Pre-test matching
    - ▶ Post-stratification
- ▶ Maximizing profits
    - ▶ Test & roll
    - ▶ Multi-armed bandits
- ▶ When you can't randomize (time permitting)

About Elea McDonnell Feit

- Professor at Drexel University
  - Teach data-driven digital marketing and marketing experiments
  - Develop new marketing analytics tools
    - Measuring Multi-Channel Advertising Response
    - Test & Roll: Profit-Maximizing A/B Tests
  - Make analytics accessible to practitioners
    - R for Marketing Research and Analytics
- Previously
  - General Motors
  - The Modellers
  - Wharton Customer Analytics

Materials

Slides and code at https://eleafeit.github.io/ab_test/.

R Markdown source is at https://github.com/eleafeit/ab_test/.

How to use the materials

We will walk through a set of examples that I created using the R (a statistical programming language).

- ▶ **If you don't know R**, let me drive the R syntax so that you can focus on where we are going. Download the slides and follow along.
- ▶ **If you are learning R**, you should also let me drive. I can answer some R syntax questions along the way, but I don't want to get stuck in the syntactical mud. The code will be there later when you want to review.
- ▶ **If you know R well**, download the RMarkdown files and run the code as we go along.

I'm adaptable. Please ask questions so I can calibrate.

Let's go!