Campaign Testing: A quick look at the code (optional lesson)

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How is this implemented?

- An interactive Shiny package (http://shiny.rstudio.com)
- Built using the R analysis platform (http://cran.r-project.org)
- Source code: https://github.com/WinVector/CampaignPlanner
- Online application: https://win-vector.shinyapps.io/CampaignPlanner/

Purpose of this (optional) lesson

- Just to give you
  - Quick pointers to the code
  - Some fun extensions ideas (if you are already a R hacker)

The ideas

- Use R's built in distribution density functions to get the one dimensional graphs
- To compute the posterior probability of one campaign being worth more than the other use the sum over all pairs of graph entries as an approximate two dimensional numeric integral

The files

- functions.R : all the calculations
- server.R / ui.R : the Shiny application definitions
- CampaignPlanner.Rproj : the RStudio project file
  - RStudio: http://www.rstudio.com/
  - highly recommended integrated development environment

Some possible extension projects

- For the experienced R programmer

Extension project 1

- Accept priors from previous similar campaigns by allowing a user to specify the mean and variance of the population of previous campaigns
- Convert this to a beta-prior
- Allows slightly faster inference, though likely data overwhelms this sort of prior quickly.

Extension project 2

- Allow specification of prior as a bound ("we will never believe a campaign will have a success rate above x%).
- Violates Cromwell's rule, so this prior would remain present in the posterior.

Extension project 3

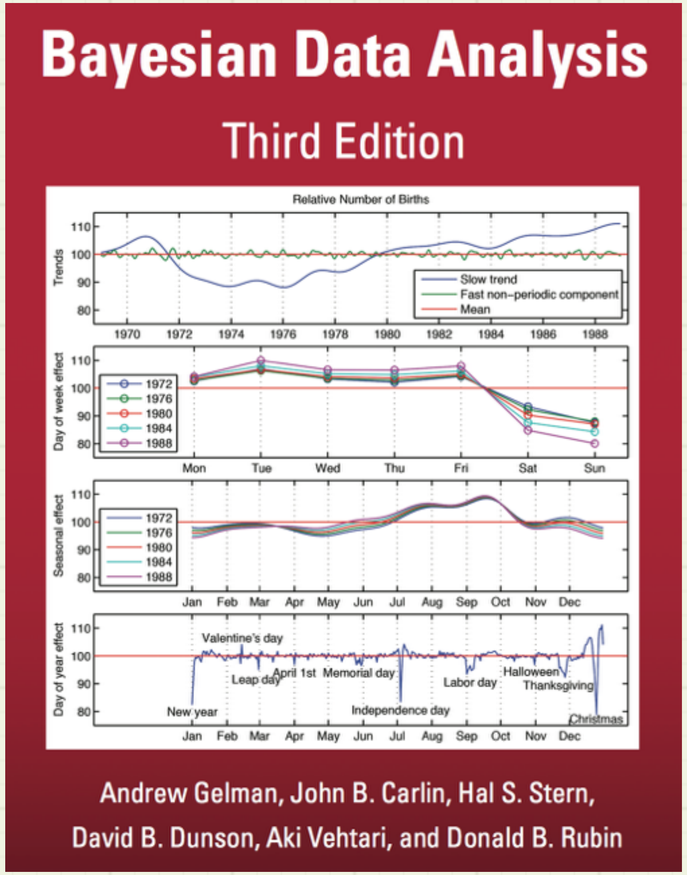
- Allow conditional information per action
  - Different facts available per-action
- Moves from population estimation to modeling based on individual demographics
- Likely some variation of Beta regression or Poisson regression could work here
  - See: http://www.win-vector.com/blog/2014/01/generalized-linear-models-for-predicting-rates/

What to take away

- There is always more you can try to model

Reference

- *Bayesian Data Analysis*, 3rd edition, by Andrew Gelman, John Carlin, Hal Stern, David Dunson, Aki Vehtari, and Donald Rubin.
  - http://www.stat.columbia.edu/~gelman/book/
  - Very good, but highly technical
- I don't yet have an introductory book on the topic I am fully comfortable with
  - One contender (that I haven't fully evaluated yet):
    - *Think Bayes* by Allen B. Downey
    - http://www.greenteapress.com/thinkbayes/



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