Zelig: Tools to expand the reach of R

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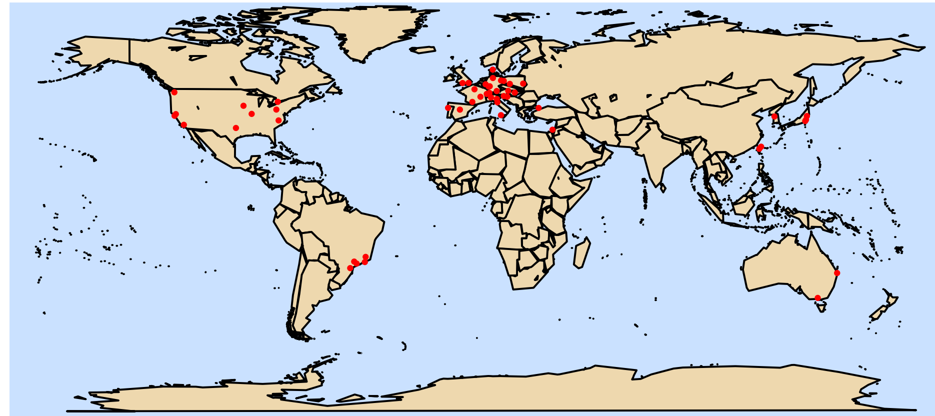
Vienna, Austria
June 16, 2006

The current R world



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- For developers:
  Makes it easier to translate user-inputs
- For researchers, students, and instructors:
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  - Computes quantities of substantive interest for every model

$$E(Y) \quad Y|X \quad E(Y|X_1) - E(Y|X_0) \quad \ldots$$

  - 3 commands $\longrightarrow$ Simplified UI
- For researchers, students, and instructors
  who don't use R:
  An automatically-generated GUI

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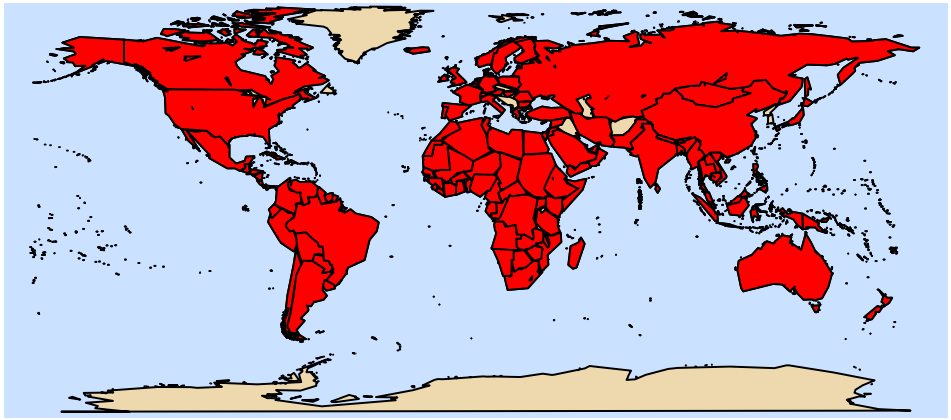
Goal: R world (with the help of Zelig)



Users only need to know 3 commands

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z <- zelig(vote~race+educate,      Select vars
     data=turnout,                 Select data set
     model="probit")               Select model

x <- setx(z.out, educate=12)       Select QIs

s <- sim(z, x=x)                   Calculate QIs
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Built-in Zelig functionality

- Handle sets of multiply-imputed data frames
- Bootstrap quantities of interest
- Stratify data
- Conditional prediction

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No need to change existing packages

Developers only need to add a few functions

Estimate `zelig()`

- (1) `zelig2mymodel()`
- (2) `mymodel()`

Interpret `sim()`

- (3) `param.myclass()`
- (4) `qi.myclass()`

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- User specifies a `formula`
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- `model.matrix`
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But for more than one equation?

- Hard to parse parameter vector into appropriate subsets in multi-eqn models
- Each package has different hacks
  → different and diverse UIs
- Challenging for programmers
  → confusing for users

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Represent arbitrarily complicated models

Use a list of equations:

```
f <- list(mu1 = y1 ~ x1 + x2 + x3,
          mu2 = y2 ~ x1 + x4 + x5)

f <- list(mu1 = y1 ~ x1 + tag(x2, beta2),
          mu2 = y2 ~ x3 + tag(x4, beta2),
          rho = ~ z1 - 1)

f <- list(cbind(y1, y2) ~ x1 + x2)
```


Developer tools for lists of eqns

- `parse.formula(formula, model)`
- `model.frame.multiple(formula, data)`
- `model.matrix.multiple(formula, data, eqn, shape)`
- `parse.par(par, terms, eqn, shape)`

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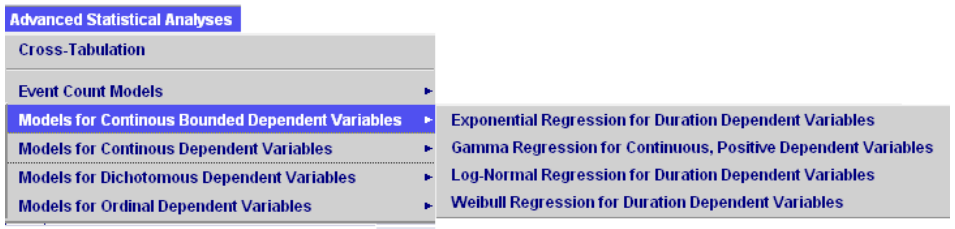
The Virtual Data Center GUI for Zelig



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- Developer writes a self-contained function to describe new model
- Every time the VDC is compiled, GUI "dynamically" extends to include new models!
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...and can with Zelig!

- Partnership with the US Census Bureau (DataFerrett)
- Partnership with the Broad Institute (GenePattern)
- Your suggestions!

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Visit Zelig on the web at

http://gking.harvard.edu/zelig/