QUAIL: AN OBJECT ORIENTED STATISTICAL SOFTWARE ENVIRONMENT

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Quail is a quantitative programming environment written in Common Lisp (CL) and is largely object-oriented (based on the CL Object System). Quail is designed to extend the CL language to better support quantitative analysis. We provide extended arithmetic, rich array manipulation facilities, smooth access to other languages (esp. Fortran and C), a window system, and an interactive documentation system.

Peculiar to statistical analyses are the following:

1. Statistical Graphics.
    - Completely object-oriented system for building interactive displays.
    - Collection of stock statistical graphics – Histograms, boxplots, function plots, scatterplots, 3d-rotating scatterplots, scatterplot matrices, ...
    - Arbitrary linking of display elements.
2. Statistical Response models
    - generalized linear models
    - generalized additive models
3. Probability Measures
    - Integration, expectation, etc.
    - Quantiles and pseudo-random numbers.

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In this talk an overview of the Quail design and implementation will be given with particular attention paid to the areas of primary statistical interest. Our approach to software representation of statistical methodology will be contrasted to that of others. I will conclude with discussion of more speculative research in statistical software engineering.