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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Proceeding	91193335
Party	Plaintiff Embarcadero Technologies, Inc.
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

EMBARCADERO TECHNOLOGIES, INC. **Opposer** **v.** **RSTUDIO, INC.** **Applicant.**	**Opposition No.: 91-193,335** **Trademarks: RSTUDIO** **Serial Nos.: 77/691,980** **77/691,984** **77/691,987**

OPPOSER'S NOTICE OF RELIANCE

Pursuant to Trademark Rule 2.122(e) Opposer, EMBARCADERO TECHNOLOGIES, INC., ("Embarcadero", or "Opposer"), by its attorneys, hereby gives notice that it will or may rely on the following materials relevant to the issues in the captioned proceeding, copies of which are attached to the Notice. The Notice of Reliance is being submitted at this time pursuant to stipulation by the parties.

1. RStudio Inc.'s current website as of February 28, 2011, attached hereto as Exhibit A to show the manner in which Applicant is using and/or referencing to its RSTUDIO marks.
2. The discovery deposition (including Exhibits) of Joseph J. Allaire, dated September 27, 2010, attached hereto as Exhibit B.
3. Joseph Adler's book "R in a Nutshell", released December 2009, providing an introduction to the R computing language, attached hereto as Exhibit C.
4. The article "RinRuby: Accessing the R Interpreter from Pure Ruby" published in the Journal of Statistical Software dated January 2009, Volume 29, Issue 4, available at: http://www.jstatsoft.org/v29/i04/paper, attached hereto as Exhibit D. The article shows the connectivity between the R computing language and the Ruby programming language.

5. The article "Collaborative Software Development Using R-Forge" published in The R Journal dated May 2009, Volume 1, Issue 1, available at: http://journal.r-project.org/archive/2009-1/2009-1_index.html, attached hereto as Exhibit E. The article reviews the R-Forge platform for development of R-related software.

6. The online article named "Calling Ruby, Perl or Python from R", dated June 16, 2010 and appearing at: http://www.r-chart.com/2010/06/if-you-want-to-interact-with-other.html, attached hereto as Exhibit F. The article discusses the links between the R computing language and other programming languages.

7. The RSRuby webpage, appearing on RubyForge's website at: http://rubyforge.org/projects/rsruby, attached hereto as Exhibit G and showing the connections between the Ruby programming language and the R computing language.

8. The online page "What is R" appearing on the About Section of R-Project's website at: http://www.r-project.org/about.html, attached hereto as Exhibit H to provide an explanation of the R computing language and its environment.

9. The Online announcement for Use R! The R User Conference 2010 held July 20-23, 2010 appearing on: http://user2010.org/, attached hereto as Exhibit I to show the varied community attending this conference.

10. The Online blog article named "Revolution Analytics targets R language, platform at growing need to handle 'big data' crunching", dated August 4, 2010 and appearing at: http://seekingalpha.com/instablog/122491-dana-gardner/85572-revolution-analytics-targets-r-language-platform-at-growing-need-to-handle-big-data-crunching, attached hereto as Exhibit J, to show the uses of the R computing language to analyze "big data".

11. Dictionary definitions of the term "statistics", from the Mirriam-Webster online dictionary, the Free dictionary online and the Wikipedia website attached hereto as

Exhibit K.

12. Portions of Embarcadero's current website as of February 28, 2011, attached hereto as Exhibit L to show the various ER/STUDIO products offered by Opposer.

Dated: February 28, 2011

Respectfully Submitted,

EMBARCADERO TECHNOLOGIES, INC.
By /Martin R. Greenstein/
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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **OPPOSER'S NOTICE OF RELIANCE** is being served on February 28, 2011, by first class mail, postage prepaid on Applicant's Attorney of Record at his address below:

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/Mariela P Vidolova/
Mariela P. Vidolova

Exhibit K

statistics

statistics

6 ENTRIES FOUND:

statistics (noun plural but singular or plural in construction)
Einstein-Bose statistics (noun)
vital statistics (noun plural)

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sta·tis·tics *noun pl but singular or pl in constr* \stə-'tis-tiks\

Definition of STATISTICS

1 : a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data

2 : a collection of quantitative data

Origin of STATISTICS

German *Statistik* study of political facts and figures, from New Latin *statisticus* of politics, from Latin *status* state

First Known Use: 1770

Rhymes with STATISTICS

ballistics, ekistics, linguistics, logistics, patristics, stylistics

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sta·tis·tics (stə-tĭs'tĭks)
n.

1. *(used with a sing. verb)* The mathematics of the collection, organization, and interpretation of numerical data, especially the analysis of population characteristics by inference from sampling.
2. *(used with a pl. verb)* Numerical data.

[From German Statistik, *political science*, from New Latin statisticus, *of state affairs*, from Italian statista, *person skilled in statecraft*, from stato, *state*, from Old Italian, from Latin status, *position, form of government*; see stā- in Indo-European roots.]

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statistics [stəˈtɪstɪks]
n

1. (Mathematics & Measurements / Statistics) *(functioning as plural)* quantitative data on any subject, esp data comparing the distribution of some quantity for different subclasses of the population *statistics for earnings by different age groups*
2. (Mathematics & Measurements / Statistics) *(functioning as singular)*
a. the classification and interpretation of such data in accordance with probability theory and the application of methods such as hypothesis testing to them
b. the mathematical study of the theoretical nature of such distributions and tests
See also descriptive statistics, statistical inference

[C18 (originally ``science dealing with facts of a state''): via German *Statistik*, from New Latin *statisticus* concerning state affairs, from Latin *status* STATE]

Collins English Dictionary – Complete and Unabridged © HarperCollins Publishers 1991, 1994, 1998, 2000, 2003

statistics (stə-tĭs'tĭks)
1. *(Used with a singular verb)* The branch of mathematics that deals with the collection, organization, analysis, and interpretation of numerical data. Statistics is especially useful in drawing general conclusions about a set of data from a sample of the data.
2. *(Used with a plural verb)* Numerical data.

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Thesaurus

Legend: Synonyms | Related Words | Antonyms

Noun 1. statistics - a branch of applied mathematics concerned with the collection and interpretation of quantitative data and the use of probability theory to estimate population parameters
sampling - (statistics) the selection of a suitable sample for study
distribution, statistical distribution - (statistics) an arrangement of values of a

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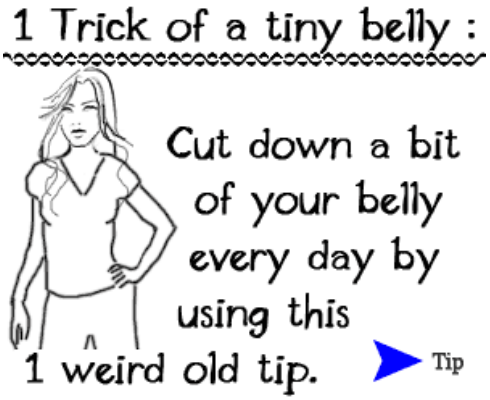

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Statistics

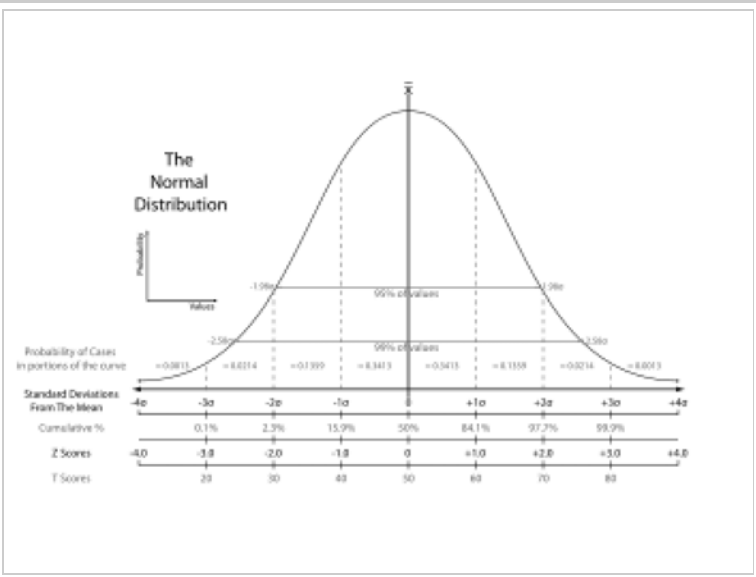
From Wikipedia, the free encyclopedia

Statistics is the science of the collection, organization, and interpretation of data.[1][2] It deals with all aspects of this, including the planning of data collection in terms of the design of surveys and experiments.[1]

A statistician is someone who is particularly well versed in the ways of thinking necessary for the successful application of statistical analysis. Such people have often gained this experience through working in any of a wide number of fields. There is also a discipline called *mathematical statistics*, which is concerned with the theoretical basis of the subject.

The word *statistics*, when referring to the scientific discipline, is singular, as in "Statistics is an art."[3] This should not be confused with the word *statistic*, referring to a quantity (such as mean or median) calculated from a set of data,[4] whose plural is *statistics* ("this statistic seems wrong" or "these statistics are misleading").

Contents



More probability density will be found the closer one gets to the expected (mean) value in a normal distribution. Statistics used in standardized testing assessment are shown. The scales include *standard deviations, cumulative percentages, percentile equivalents, Z-scores, T-scores, standard nines,* and *percentages in standard nines.*

Scope

Some consider statistics to be a mathematical science pertaining to the collection, analysis, interpretation or explanation, and presentation of data,[5] while others consider it a branch of mathematics[6] concerned with collecting and interpreting data. Because of its empirical roots and its focus on applications, statistics is usually considered to be a distinct mathematical science rather than a branch of mathematics.[7][8]

Statisticians improve the quality of data with the design of experiments and survey sampling. Statistics also provides tools for prediction and forecasting using data and statistical models. Statistics is applicable to a wide variety of academic disciplines, including natural and social sciences, government, and business. Statistical consultants are available to provide help for organizations and companies without direct access to expertise relevant to their particular problems.

Statistical methods can be used to summarize or describe a collection of data; this is called *descriptive statistics*. This is useful in research, when communicating the results of experiments. In addition, patterns in the data may be modeled in a way that accounts for randomness and uncertainty in the observations, and are then used to draw inferences about the process or population being studied; this is called *inferential statistics*. Inference is a vital element of scientific advance, since it provides a prediction (based in data) for where a theory logically leads. To further prove the guiding theory, these predictions are tested as well, as part of the scientific method. If the inference holds true, then the descriptive statistics of the new data increase the soundness of that hypothesis. Descriptive statistics and inferential statistics (a.k.a., predictive statistics) together comprise *applied statistics*.[9]

Statistics is closely related to probability theory, with which it is often grouped; the difference, roughly, is that in probability theory one starts from given parameters of a total population, to deduce probabilities pertaining to samples, while statistical inference, moving in the opposite direction, is inductive inference from samples to the parameters of a larger or total population.

History

Main article: History of statistics

Some scholars pinpoint the origin of statistics to 1663, with the publication of *Natural and Political Observations upon the Bills of Mortality* by John Graunt.[10] Early applications of statistical thinking revolved around the needs of states to base policy on demographic and economic data, hence its *stat-* etymology. The scope of the discipline of statistics broadened in the early 19th century to include the collection and analysis of data in general. Today, statistics is widely employed in government, business, and the natural and social sciences.

Its mathematical foundations were laid in the 17th century with the development of probability theory by Blaise Pascal and Pierre de Fermat. Probability theory arose from the study of games of chance. The method of least squares was first described by Carl Friedrich Gauss around 1794. The use of modern computers has expedited large-scale statistical computation, and has also made possible new methods that are impractical to perform manually.

Overview

In applying statistics to a scientific, industrial, or societal problem, it is necessary to begin with a population or process to be studied. Populations can be diverse topics such as "all persons living in a country" or "every atom composing a crystal". A population can also be composed of observations of a process at various times, with the data from each observation serving as a different member of the overall group. Data collected about this kind of

"population" constitutes what is called a time series.

For practical reasons, a chosen subset of the population called a sample is studied — as opposed to compiling data about the entire group (an operation called census). Once a sample that is representative of the population is determined, data is collected for the sample members in an observational or experimental setting. This data can then be subjected to statistical analysis, serving two related purposes: description and inference.

- Descriptive statistics summarize the population data by describing what was observed in the sample numerically or graphically. Numerical descriptors include mean and standard deviation for continuous data types (like heights or weights), while frequency and percentage are more useful in terms of describing categorical data (like race).
- Inferential statistics uses patterns in the sample data to draw inferences about the population represented, accounting for randomness. These inferences may take the form of: answering yes/no questions about the data (hypothesis testing), estimating numerical characteristics of the data (estimation), describing associations within the data (correlation) and modeling relationships within the data (for example, using regression analysis). Inference can extend to forecasting, prediction and estimation of unobserved values either in or associated with the population being studied; it can include extrapolation and interpolation of time series or spatial data, and can also include data mining.

> "... it is only the manipulation of uncertainty that interests us. We are not concerned with the matter that is uncertain. Thus we do not study the mechanism of rain; only whether it will rain."
>
> Dennis Lindley, "The Philosophy of Statistics", *The Statistician* (2000).

The concept of correlation is particularly noteworthy for the potential confusion it can cause. Statistical analysis of a data set often reveals that two variables (properties) of the population under consideration tend to vary together, as if they were connected. For example, a study of annual income that also looks at age of death might find that poor people tend to have shorter lives than affluent people. The two variables are said to be correlated; however, they may or may not be the cause of one another. The correlation phenomena could be caused by a third, previously unconsidered phenomenon, called a lurking variable or confounding variable. For this reason, there is no way to immediately infer the existence of a causal relationship between the two variables. (See Correlation does not imply causation.)

For a sample to be used as a guide to an entire population, it is important that it is truly a representative of that overall population. Representative sampling assures that the inferences and conclusions can be safely extended from the sample to the population as a whole. A major problem lies in determining the extent to which the sample chosen is actually representative. Statistics offers methods to estimate and correct for any random trending within the sample and data collection procedures. There are also methods for designing experiments that can lessen these issues at the outset of a study, strengthening its capability to discern truths about the population. Statisticians[*citation needed*] describe stronger methods as more "robust".(See experimental design.)

Randomness is studied using the mathematical discipline of probability theory. Probability is used in "Mathematical statistics" (alternatively, "statistical theory") to study the sampling distributions of sample statistics and, more generally, the properties of statistical procedures. The use of any statistical method is valid when the system or population under consideration satisfies the assumptions of the method.

Misuse of statistics can produce subtle, but serious errors in description and interpretation — subtle in the sense that even experienced professionals make such errors, and serious in the sense that they can lead to devastating decision errors. For instance, social policy, medical practice, and the reliability of structures like bridges all rely on

the proper use of statistics. There is further discussion later. Even when statistical techniques are correctly applied, the results can be difficult to interpret for those lacking expertise. The statistical significance of a trend in the data — which measures the extent to which a trend could be caused by random variation in the sample — may or may not agree with an intuitive sense of its significance. The set of basic statistical skills (and skepticism) that people need to deal with information in their everyday lives properly is referred to as statistical literacy.

Statistical methods

Experimental and observational studies

A common goal for a statistical research project is to investigate causality, and in particular to draw a conclusion on the effect of changes in the values of predictors or independent variables on dependent variables or response. There are two major types of causal statistical studies: experimental studies and observational studies. In both types of studies, the effect of differences of an independent variable (or variables) on the behavior of the dependent variable are observed. The difference between the two types lies in how the study is actually conducted. Each can be very effective. An experimental study involves taking measurements of the system under study, manipulating the system, and then taking additional measurements using the same procedure to determine if the manipulation has modified the values of the measurements. In contrast, an observational study does not involve experimental manipulation. Instead, data are gathered and correlations between predictors and response are investigated.

Experiments

The basic steps of a statistical experiment are:

1. Planning the research, including finding the number of replicates of the study, using the following information: preliminary estimates regarding the size of treatment effects, alternative hypotheses, and the estimated experimental variability. Consideration of the selection of experimental subjects and the ethics of research is necessary. Statisticians recommend that experiments compare (at least) one new treatment with a standard treatment or control, to allow an unbiased estimate of the difference in treatment effects.
2. Design of experiments, using blocking to reduce the influence of confounding variables, and randomized assignment of treatments to subjects to allow unbiased estimates of treatment effects and experimental error. At this stage, the experimenters and statisticians write the *experimental protocol* that shall guide the performance of the experiment and that specifies the *primary analysis* of the experimental data.
3. Performing the experiment following the experimental protocol and analyzing the data following the experimental protocol.
4. Further examining the data set in secondary analyses, to suggest new hypotheses for future study.
5. Documenting and presenting the results of the study.

Experiments on human behavior have special concerns. The famous Hawthorne study examined changes to the working environment at the Hawthorne plant of the Western Electric Company. The researchers were interested in determining whether increased illumination would increase the productivity of the assembly line workers. The researchers first measured the productivity in the plant, then modified the illumination in an area of the plant and checked if the changes in illumination affected productivity. It turned out that productivity indeed improved (under the experimental conditions). However, the study is heavily criticized today for errors in experimental procedures, specifically for the lack of a control group and blindness. The Hawthorne effect refers to finding that an outcome (in this case, worker productivity) changed due to observation itself. Those in the Hawthorne study became more productive not because the lighting was changed but because they were being observed.[*citation needed*]

Observational study

An example of an observational study is one that explores the correlation between smoking and lung cancer. This type of study typically uses a survey to collect observations about the area of interest and then performs statistical analysis. In this case, the researchers would collect observations of both smokers and non-smokers, perhaps through a case-control study, and then look for the number of cases of lung cancer in each group.

Levels of measurement

Main article: levels of measurement

There are four main levels of measurement used in statistics: nominal, ordinal, interval, and ratio. Each of these have different degrees of usefulness in statistical research. Ratio measurements have both a meaningful zero value and the distances between different measurements defined; they provide the greatest flexibility in statistical methods that can be used for analyzing the data.[*citation needed*] Interval measurements have meaningful distances between measurements defined, but the zero value is arbitrary (as in the case with longitude and temperature measurements in Celsius or Fahrenheit). Ordinal measurements have imprecise differences between consecutive values, but have a meaningful order to those values. Nominal measurements have no meaningful rank order among values.

Because variables conforming only to nominal or ordinal measurements cannot be reasonably measured numerically, sometimes they are grouped together as categorical variables, whereas ratio and interval measurements are grouped together as quantitative or continuous variables due to their numerical nature.

Key terms used in statistics

Null hypothesis

Interpretation of statistical information can often involve the development of a null hypothesis in that the assumption is that whatever is proposed as a cause has no effect on the variable being measured.

The best illustration for a novice is the predicament encountered by a jury trial. The null hypothesis, H_0, asserts that the defendant is innocent, whereas the alternative hypothesis, H_1, asserts that the defendant is guilty. The indictment comes because of suspicion of the guilt. The H_0 (status quo) stands in opposition to H_1 and is maintained unless H_1 is supported by evidence"beyond a reasonable doubt". However,"failure to reject H_0" in this case does not imply innocence, but merely that the evidence was insufficient to convict. So the jury does not necessarily *accept* H_0 but *fails to reject* H_0. While one can not"prove" a null hypothesis one can test how close it is to being true with a power test, which tests for type II errors.

Error

Working from a null hypothesis two basic forms of error are recognized:

- Type I errors where the null hypothesis is falsely rejected giving a "false positive".
- Type II errors where the null hypothesis fails to be rejected and an actual difference between populations is missed.

Error also refers to the extent to which individual observations in a sample differ from a central value, such as the

sample or population mean. Many statistical methods seek to minimize the mean-squared error, and these are called "methods of least squares."

Measurement processes that generate statistical data are also subject to error. Many of these errors are classified as random (noise) or systematic (bias), but other important types of errors (e.g., blunder, such as when an analyst reports incorrect units) can also be important.

Confidence intervals

Most studies will only sample part of a population and then the result is used to interpret the null hypothesis in the context of the whole population. Any estimates obtained from the sample only approximate the population value. Confidence intervals allow statisticians to express how closely the sample estimate matches the true value in the whole population. Often they are expressed as 95% confidence intervals. Formally, a 95% confidence interval of a procedure is a range where, if the sampling and analysis were repeated under the same conditions, the interval would include the true (population) value 95% of the time. This does *not* imply that the probability that the true value is in the confidence interval is 95%. (From the frequentist perspective, such a claim does not even make sense, as the true value is not a random variable. Either the true value is or is not within the given interval.) One quantity that is in fact a probability for an estimated value is the credible interval from Bayesian statistics.

Significance

Main article: Statistical significance

Statistics rarely give a simple Yes/No type answer to the question asked of them. Interpretation often comes down to the level of statistical significance applied to the numbers and often refer to the probability of a value accurately rejecting the null hypothesis (sometimes referred to as the p-value).

Referring to statistical significance does not necessarily mean that the overall result is significant in real world terms. For example, in a large study of a drug it may be shown that the drug has a statistically significant but very small beneficial effect, such that the drug will be unlikely to help the patient in a noticeable way.

Examples

Some well-known statistical tests and procedures are:

- Analysis of variance (ANOVA)
- Chi-square test
- Correlation
- Factor analysis
- Mann–Whitney U
- Mean square weighted deviation (MSWD)
- Pearson product-moment correlation coefficient
- Regression analysis
- Spearman's rank correlation coefficient
- Student's t-test
- Time series analysis

Specialized disciplines

Main article: List of fields of application of statistics

Statistical techniques are used in a wide range of types of scientific and social research, including: Biostatistics, Computational biology, Computational sociology, Network biology, Social science, Sociology and Social research. Some fields of inquiry use applied statistics so extensively that they have specialized terminology. These disciplines include:

- Actuarial science
- Applied information economics
- Biostatistics
- Business statistics
- Chemometrics (for analysis of data from chemistry)
- Data mining (applying statistics and pattern recognition to discover knowledge from data)
- Demography
- Econometrics
- Energy statistics
- Engineering statistics
- Epidemiology
- Geography and Geographic Information Systems, specifically in Spatial analysis
- Image processing
- Psychological statistics
- Reliability engineering
- Social statistics

In addition, there are particular types of statistical analysis that have also developed their own specialised terminology and methodology:

- Bootstrap & Jackknife Resampling
- Multivariate statistics
- Statistical classification
- Statistical surveys
- Structured data analysis (statistics)
- Survival analysis
- Statistics in various sports, particularly baseball and cricket

Statistics form a key basis tool in business and manufacturing as well. It is used to understand measurement systems variability, control processes (as in statistical process control or SPC), for summarizing data, and to make data-driven decisions. In these roles, it is a key tool, and perhaps the only reliable tool.

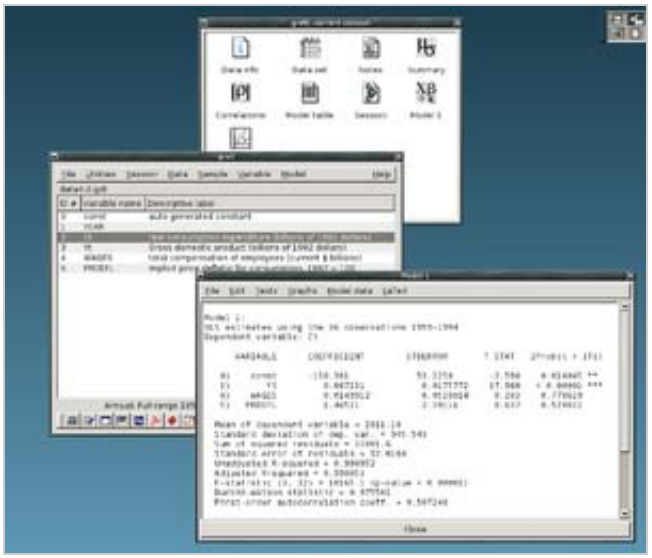
Statistical computing

Main article: statistical computing

The rapid and sustained increases in computing power starting from the second half of the 20th century have had a substantial impact on the practice of statistical science. Early statistical models were almost always from the class of

linear models, but powerful computers, coupled with suitable numerical algorithms, caused an increased interest in nonlinear models (such as neural networks) as well as the creation of new types, such as generalized linear models and multilevel models.

Increased computing power has also led to the growing popularity of computationally intensive methods based on resampling, such as permutation tests and the bootstrap, while techniques such as Gibbs sampling have made use of Bayesian models more feasible. The computer revolution has implications for the future of statistics with new emphasis on "experimental" and "empirical" statistics. A large number of both general and special purpose statistical software are now available.



gretl, an example of an open source statistical package

Misuse

Main article: Misuse of statistics

There is a general perception that statistical knowledge is all-too-frequently intentionally misused by finding ways to interpret only the data that are favorable to the presenter.[11] The famous saying, "There are three kinds of lies: lies, damned lies, and statistics".[12] which was popularized in the USA by Samuel Clemens and incorrectly attributed by him to Disraeli (1804–1881), has come to represent the general mistrust [and misunderstanding] of statistical science. Harvard President Lawrence Lowell wrote in 1909 that statistics, *"...like veal pies, are good if you know the person that made them, and are sure of the ingredients."*

If various studies appear to contradict one another, then the public may come to distrust such studies. For example, one study may suggest that a given diet or activity raises blood pressure, while another may suggest that it lowers blood pressure. The discrepancy can arise from subtle variations in experimental design, such as differences in the patient groups or research protocols, which are not easily understood by the non-expert. (Media reports usually omit this vital contextual information entirely, because of its complexity.)

By choosing (or rejecting, or modifying) a certain sample, results can be manipulated. Such manipulations need not be malicious or devious; they can arise from unintentional biases of the researcher. The graphs used to summarize data can also be misleading.

Deeper criticisms come from the fact that the hypothesis testing approach, widely used and in many cases required by law or regulation, forces one hypothesis (the null hypothesis) to be "favored," and can also seem to exaggerate the importance of minor differences in large studies. A difference that is highly statistically significant can still be of no practical significance. (See criticism of hypothesis testing and controversy over the null hypothesis.)

One response is by giving a greater emphasis on the *p*-value than simply reporting whether a hypothesis is rejected at the given level of significance. The *p*-value, however, does not indicate the size of the effect. Another increasingly common approach is to report confidence intervals. Although these are produced from the same calculations as those of hypothesis tests or *p*-values, they describe both the size of the effect and the uncertainty surrounding it.

Statistics applied to mathematics or the arts

Traditionally, statistics was concerned with drawing inferences using a semi-standardized methodology that was "required learning" in most sciences. This has changed with use of statistics in non-inferential contexts. What was once considered a dry subject, taken in many fields as a degree-requirement, is now viewed enthusiastically. Initially derided by some mathematical purists, it is now considered essential methodology in certain areas.

- In number theory, scatter plots of data generated by a distribution function may be transformed with familiar tools used in statistics to reveal underlying patterns, which may then lead to hypotheses.
- Methods of statistics including predictive methods in forecasting, are combined with chaos theory and fractal geometry to create video works that are considered to have great beauty.
- The process art of Jackson Pollock relied on artistic experiments whereby underlying distributions in nature were artistically revealed. With the advent of computers, methods of statistics were applied to formalize such distribution driven natural processes, in order to make and analyze moving video art.
- Methods of statistics may be used predicatively in performance art, as in a card trick based on a Markov process that only works some of the time, the occasion of which can be predicted using statistical methodology.
- Statistics can be used to predicatively create art, as in the statistical or stochastic music invented by Iannis Xenakis, where the music is performance-specific. Though this type of artistry does not always come out as expected, it does behave in ways that are predictable and tuneable using statistics.

See also

Main article: Outline of statistics

- Glossary of probability and statistics
- Notation in probability and statistics
- List of statistics articles
- List of academic statistical associations
- List of national and international statistical services
- List of important publications in statistics
- List of university statistical consulting centers
- List of statistical packages (software)
- Foundations of statistics
- Official statistics
- List of statisticians

Notes

1. ^ ***a b*** Dodge, Y. (2003) *The Oxford Dictionary of Statistical Terms*, OUP. ISBN 0-19-920613-9
2. ^ The Free Online Dictionary (http://www.thefreedictionary.com/dict.asp?Word=statistics)
3. ^ "Statistics" (http://www.merriam-webster.com/dictionary/statistics) . *Merriam-Webster Online Dictionary*. http://www.merriam-webster.com/dictionary/statistics.
4. ^ "Statistic" (http://www.merriam-webster.com/dictionary/statistic) . *Merriam-Webster Online Dictionary*. http://www.merriam-webster.com/dictionary/statistic.
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6. ^ Hays, William Lee, *Statistics for the social sciences*, Holt, Rinehart and Winston, 1973, p.xii, ISBN 978-0-03-077945-9
7. ^ Moore, David (1992). "Teaching Statistics as a Respectable Subject". *Statistics for the Twenty-First Century*. Washington, DC: The Mathematical Association of America. pp. 14–25.
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Investigating Statistical Concepts, Applications, and Methods. Duxbury Press. ISBN 978-0495050643. http://www.rossmanchance.com/iscam/preface.pdf.

9. ^ Anderson, , D.R.; Sweeney, D.J.; Williams, T.A.. *Statistics: Concepts and Applications*, pp. 5–9. West Publishing Company, 1986.
10. ^ Willcox, Walter (1938) *The Founder of Statistics*. (http://www.jstor.org/stable/1400906) Review of the International Statistical Institute 5(4):321–328.
11. ^ Darrell Huff. *How to Lie With Statistics* 1954. WW Norton & Company, Inc. New York, NY. ISBN 0-393-31072-8
12. ^ Leonard H.Courtney (1832–1918) in a speech at Saratoga Springs', New York, August 1895, in which this sentence appeared: 'After all, facts are facts, and although we may quote one to another with a chuckle the words of the Wise Statesman, "Lies – damned lies – and statistics," still there are some easy figures the simplest must understand, and the astutest cannot wriggle out of.', *earliest documented use of exact phrase.*

References

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- Desrosières, Alain (2004). *The Politics of Large Numbers: A History of Statistical Reasoning*. Trans. Camille Naish. Harvard University Press. ISBN 0-674-68932-1.
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- Lindley, D.V. (1985). *Making Decisions* (2nd ed.). John Wiley & Sons. ISBN 0-471-90808-8.
- Tijms, Henk (2004). *Understanding Probability: Chance Rules in Everyday life*. Cambridge University Press. ISBN 0-521-83329-9.

External links

Online non-commercial textbooks

- "A New View of Statistics" (http://sportsci.org/resource/stats/) , by Will G. Hopkins, AUT University
- "NIST/SEMATECH e-Handbook of Statistical Methods" (http://www.itl.nist.gov/div898/handbook/) , by U.S. National Institute of Standards and Technology and SEMATECH
- "Online Statistics: An Interactive Multimedia Course of Study" (http://onlinestatbook.com/index.html) , by David Lane, Joan Lu, Camille Peres, Emily Zitek, et al.
- "The Little Handbook of Statistical Practice" (http://www.StatisticalPractice.com) , by Gerard E. Dallal (http://www.tufts.edu/~gdallal/) , Tufts University
- "StatSoft Electronic Textbook" (http://www.statsoft.com/textbook/stathome.html) , by StatSoft (http://www.statsoft.com/index.htm)

Other non-commercial resources

- Statistics (http://stats.oecd.org/Index.aspx) (OECD)
- Probability Web (http://www.mathcs.carleton.edu/probweb/probweb.html) (Carleton College)
- Free online statistics course with interactive practice exercises (http://oli.web.cmu.edu/openlearning/forstudents/freecourses/statistics) (Carnegie Mellon University)
- Resources for Teaching and Learning about Probability and Statistics (http://www.ericdigests.org/2000-2/resources.htm) (ERIC)
- Rice Virtual Lab in Statistics (http://www.onlinestatbook.com/rvls.html) (Rice University)

- Statistical Science Web (http://www.statsci.org) (University of Melbourne)
- Applied statistics applets (http://www.mbhs.edu/~steind00/statistics.html)
- Statlib: data and software archives (http://lib.stat.cmu.edu/)
- StatProb (http://statprob.com/encyclopedia) – peer-reviewed encyclopedia sponsored by statistics and probability societies

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Exhibit J

Dana Gardner's Instablog

Revolution Analytics targets R language, platform at growing need to handle 'big data' crunching 0 comments

Aug 4, 2010 12:34 PM | about stocks: IBM, ORCL, SAP

Revolution Analytics is working to revolutionize big data analysis with better crunching tools and an updated platform that brings the open source R statistics language to some the the largest data sets.

The company is betting its new big data scalability platform will help R transition from a research and prototyping tool to a production-ready platform for such enterprise applications as quantitative finance and risk management, social media, bioinformatics, and telecommunications data analysis.

The latest version of Revolution R Enterprise comes complete with an add-on package called RevoScaleR, a framework for multi-core processing of large data sets. With RevoScaleR, Revolution Analytics targets some of the largest levels of capacity and performance for analyzing big data, they said.

“With RevoScaleR, we’ve focused on making analytical models not just scale to the big data sets, but run the analysis in a fraction of the time compared to traditional systems,” says David Smith, vice president of Community and Marketing at Revolution Analytics. “For example, the FAA publishes a data set that contains every commercial airline take off and landing between 1987 and 2008. That’s more than 13 gigabytes of data. By analyzing that data, we can figure out the likelihood of airline delays in one second.”

A rows-and-columns approach

One second to analyze 13 GB of data should turn some heads because it takes 300 seconds with traditional methods. Under the hood of RevoScaleR is rapid fire access to data. For example, the RevoScaleR uses an XDF file format, a new binary big data file format with an interface to the R language that offers high-speed access to arbitrary rows, blocks and columns of data.

“The new SQL movement was all about going from relational databases to a flat file on a disk that offers fast to access by columns. A lot of the technology that’s behind things like Twitter and Facebook take this approach,” Smith said. “We’ve taken that one step further to develop a system that accesses the database by rows and columns at the same time, which is really well-attuned to doing these statistical computations.”

RevoScaleR also relies on a collection of the most-common statistical algorithms optimized for big data, including high-performance implementations of summary statistics, linear regression, binomial logistic regression and crosstabs. Data reading and transformation tools let users interactively explore and prepare large data sets for analysis. And, extensibility lets expert R users develop and extend their own statistical algorithms.

Integrating Hadoop

Based on the open-source R technologies, Revolution R Enterprise accordingly plays well with other modern big data architectures. Revolution R Enterprise leverages sources such as Hadoop, NoSQL or key value databases, relational databases, and data warehouses. These products can be used to store, regularize, and do basic manipulation on very large data sets—while Revolution R Enterprise now provides advanced analytics.

“Together, Hadoop and R can store and analyze massive, complex data,” says Saptarshi Guha, developer of the popular RHIPE R package that integrates the Hadoop framework with R in an automatically distributed computing environment. “Employing the new capabilities of Revolution R Enterprise, we will be able to go even further and compute dig data regressions and more.”

The new RevoScaleR package will be delivered as part of Revolution R Enterprise 4.0, which will be available for 32-and 64-bit Microsoft Windows in the next 30 days. Support for Red Hat Enterprise Linux (RHEL 5) is planned for later this year.

BriefingsDirect contributor Jennifer LeClaire provided editorial assistance and research on this post. She can be reached at http://www.linkedin.com/in/jleclaire and http://www.jenniferleclaire.com.

You may also be interested in:

- Aster Data delivers 30 analytics packages and MapReduce functions for mainstream data analytics
- Greenplum pushes envelope with MapReuce and parallelism enhancements to its extreme-scale data offering
- Delivering data analytics through Workday SaaS ERP apps empowers business managers at actual decision points

Disclosure: No positions.
Themes: Business Intelligence, data, data analytics, Revolution Analytics, software, technology Stocks: IBM, ORCL, SAP

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Exhibit I

The R User Conference 2010

July 20-23
National Institute of Standards and Technology (NIST),
Gaithersburg, Maryland, USA

Host: National Institute of Standards and Technology
Sponsors: R Foundation for Statistical Computing

Conference

About the Conference
Date & Location
Important Dates
Call for Papers
Program Committee
Download: Logo, Poster
Mailing list
Funding
Sponsorship
Participants
Slide submission

Program

Conference Program
Program Booklet (PDF)
Book of Contributed Abstracts (PDF)
Presentations
Social Program
Tutorials
Invited Lectures
Panel Discussion

Gaithersburg, Maryland

About NIST
Accommodation
Travel information

About the Conference

useR! 2010, the R user conference, took place at the Gaithersburg, Maryland, USA campus of the National Institute of Standards and Technology (NIST) from **2010-07-21 to 2010-07-23**. Pre-conference tutorials took place on July 20.

The conference is organized by NIST and funded by the R Foundation for Statistical Computing.

Following the successful useR! 2004, useR! 2006, useR! 2007, useR! 2008, and useR! 2009, conferences, the conference is focused on:

1. R as the `lingua franca' of data analysis and statistical computing,
2. providing a platform for R users to discuss and exchange ideas how R can be used to do statistical computations, data analysis, visualization and exciting applications in various fields,
3. giving an overview of the new features of the rapidly evolving R project.

As for the predecessor conferences, the program consists of two parts:

1. invited lectures discussing new R developments and exciting applications of R,
2. user-contributed presentations reflecting the wide range of fields in which R is used to analyze data.

A major goal of the useR! conference is to bring users from various fields together and provide a platform for discussion and exchange of ideas: both in the formal framework of presentations as well as in the informal part of the conference in Gaithersburg.

Prior to the conference, on 2010-07-20, there are tutorials offered at the conference site. Each tutorial has a length of 3 hours and takes place either in the morning or afternoon.

Invited speakers:
Mark Handcock, Frank Harrell Jr, Friedrich Leisch, Uwe Ligges, Richard Stallman, Luke Tierney, Diethelm Würtz

Program committee:

Louis Bajuk-Yorgan, Dirk Eddelbuettel, John Fox, Virgilio Gómez-Rubio, Richard Heiberger, Torsten Hothorn, Aaron King, Jan de Leeuw, Nicholas Lewin-Koh, Andy Liaw, Uwe Ligges, Martin Mächler, Katharine Mullen, Heather Turner, Ravi Varadhan, H. D. Vinod, John Verzani, Alan Zaslavsky, Achim Zeileis

Organizing Committee:

Kevin Coakley, Nathan Dodder, David Gil, William Guthrie, Olivia Lau, Walter Liggett, John Lu, Katharine

Date & Location

July 21-23, 2010

National Institute of Standards and Technology (NIST)

100 Bureau Drive
Gaithersburg, MD, 20899, USA

Important Dates

2009-10-01 open submission of abstracts
2009-10-01 open registration
2009-11-01 tutorial submission deadline
2010-03-01 early registration deadline
2010-03-01 submission deadline for abstracts
Before 2010-03-15 notification of acceptance
2010-06-20 registration deadline (later registration NOT possible

Mullen, Jonathon Phillips, Antonio Possolo, Daniel Samarov, Ravi Varadhan

on site)
2010-07-20 tutorials
2010-07-21 conference start
2010-07-23 conference end

Call for Papers

We invited all R users to submit abstracts presenting innovations or exciting applications of R on topics such as:

- Applied Statistics & Biostatistics
- Bayesian Statistics
- Bioinformatics
- Chemometrics and Computational Physics
- Data Mining
- Econometrics & Finance
- Environmetrics & Ecological Modeling
- High Performance Computing
- Machine Learning
- Marketing & Business Analytics
- Psychometrics
- Robust Statistics
- Social network analysis
- Spatial Statistics
- Statistics in the Social and Political Sciences
- Teaching
- Visualization & Graphics
- and many more.

Timeline of the Conference

The *scientific program* of the conference will start the morning of Wednesday, July 21, and end in the afternoon on Friday, July 23. Prior to the conference, on Tuesday, July 20, several half-day *tutorials* will be held. The *social program* will consist of an opening reception (on Tuesday, July 20), an evening reception combined with a poster session (on Wednesday, July 21), and a conference dinner (on Thursday, July 22).

Funding

The Statistical Engineering Division of NIST has generously contributed funding to subsidize conference fees and travel expenses for those who would otherwise find it difficult to attend. If you wish to apply for this financial support, please send an application to Kevin Coakley (kevin.coakley at nist.gov) by April 15, 2010. Include a brief CV, a copy of your abstract if you have submitted one, and a statement that describes your motivation to attend the conference and an amount of support required.

National Science Foundation (NSF) funds may be available to support travel and accommodation for graduate students and junior faculty at U.S. post-secondary institutions. The allocation will be based on merit and need; women and minority candidates are encouraged to apply. NSF regulations require the use of US carriers when at all possible. If you wish to apply for this financial support, please send an application to Luke Tierney (luke at stat.uiowa.edu) by April 15, 2010. Include a brief CV, a copy of your abstract if you have submitted one, and a statement that demonstrates your eligibility, your need for support, and an amount of support required. Students should include a letter of support from their supervisor.

Sponsorship

Potential sponsors of the conference can find more information here.

Accommodation

Transportation between NIST and at least the following hotels will be provided:

Crowne Plaza Hotel Rockville: use Group Identification 'NRU' to book for the rate of $129/night, without breakfast.
Sleep Inn Rockville: use the following instructions to book for a group rate of $89/night, including breakfast.
Motel 6 Gaithersburg: current rate of $54/night, without breakfast.

Note that booking via the group rate may be only slightly less expensive (and in the case of the Sleep Inn, possibly more expensive) than the ``Advance Purchase'' rate available to the general public via the hotel websites. The advantage of booking with the group rate is that you will be refunded if you need to cancel your trip and you provide the hotel 72 hours notice.

Please inform the organizing committee at useR-2010 at R-project.org if you would like transportation between NIST and a hotel other than the three listed above.

Information regarding additional options for accomodation near NIST is here.

About NIST

The NIST webpage links to information about the institute. Also note that there is a NIST YouTube channel.

Travel

Information regarding traveling to NIST is here. The program booklet (PDF) also includes some information regarding travel logistics.

Please contact the organizing committee at useR-2010 at R-project.org for further information.

Exhibit H

What is R?

Introduction to R

R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. R can be considered as a different implementation of S. There are some important differences, but much code written for S runs unaltered under R.

R provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible. The S language is often the vehicle of choice for research in statistical methodology, and R provides an Open Source route to participation in that activity.

One of R's strengths is the ease with which well-designed publication-quality plots can be produced, including mathematical symbols and formulae where needed. Great care has been taken over the defaults for the minor design choices in graphics, but the user retains full control.

R is available as Free Software under the terms of the Free Software Foundation's GNU General Public License in source code form. It compiles and runs on a wide variety of UNIX platforms and similar systems (including FreeBSD and Linux), Windows and MacOS.

The R environment

R is an integrated suite of software facilities for data manipulation, calculation and graphical display. It includes

- an effective data handling and storage facility,
- a suite of operators for calculations on arrays, in particular matrices,
- a large, coherent, integrated collection of intermediate tools for data analysis,
- graphical facilities for data analysis and display either on-screen or on hardcopy, and
- a well-developed, simple and effective programming language which includes conditionals, loops, user-defined recursive functions and input and output facilities.

The term "environment" is intended to characterize it as a fully planned and coherent system, rather than an incremental accretion of very specific and inflexible tools, as is frequently the case with other data analysis software.

R, like S, is designed around a true computer language, and it allows users to add additional functionality by defining new functions. Much of the system is itself written in the R dialect of S, which makes it easy for users to follow the algorithmic choices made. For computationally-intensive tasks, C, C++ and Fortran code can be linked and called at run time. Advanced users can write C code to manipulate R objects directly.

Many users think of R as a statistics system. We prefer to think of it of an environment within which statistical techniques are implemented. R can be extended (easily) via *packages*. There are about eight packages supplied with the R distribution and many more are available through the CRAN family of Internet sites covering a very wide range of modern statistics.

R has its own LaTeX-like documentation format, which is used to supply comprehensive documentation, both on-line in a number of formats and in hardcopy.

Exhibit G

RSRuby is a bridge between Ruby and the R interpreted language. When RSRuby is called in a Ruby script, a full R interpreter is embedded into the Ruby interpreter, allowing the Ruby script to call functions from any R library the user wishes.

- Development Status: 3 - Alpha
- Intended Audience: Developers
- License: BSD License
- Natural Language: English
- Operating System: OS X, POSIX
- Programming Language: C, Other, Ruby
- Topic: Mathematics

Registered: 2006-07-10 21:38
Activity Percentile: 19.4%
View project activity statistics.

Developer Info

Project Admins:
Alex Gutteridge

Developers:
2 [View Members]

Latest File Releases

Package	Version	Date	Notes / Monitor	Download
rsruby	0.5.1.1	February 11, 2009	-	Download

[View All Project Files]

Public Areas

Project Home Page

Tracker

- Bugs (**7** open /**11** total)
Bug Tracking System

- Support Requests (**0** open /**0** total)
Tech Support Tracking System

- Patches (**0** open /**0** total)
Patch Tracking System

- Feature Requests (**2** open /**2** total)
Feature Request Tracking System

Public Forums (**177** messages in **2** forums)

DocManager: Project Documentation

Task Manager
- To Do
- Next Release

SCM Repository (SVN: **214** updates, **117** adds)

Latest News

rsruby version 0.4.2 has been released
Alex Gutteridge - 2007-01-19 01:47
(0 Comment) [Read More/Comment(0)]

Initial RubyForge Release
Alex Gutteridge - 2006-07-14 18:12
(0 Comment) [Read More/Comment(0)]

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Exhibit F

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R-Chart

The R language as experienced by a web application/database developer...

WEDNESDAY, JUNE 16, 2010

Calling Ruby, Perl or Python from R

If you want to interact with other programming languages from R, there are various packages and bindings available. These packages provide a pretty high degree of integration between the langages and allow you to pass objects back and forth seemlessly. The downside is that you need to have the time, security rights and correct installation sequences available to complete the compilation and installation.

A quick and easy way to return a string from an external program or scripting langage is to call the *system* function. As you can see from the xamples, you must set intern=TRUE to pass the value back into the R environment. In addition, the value being passed into R is being redirected from STDOUT, so you have to use an appropriate

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being redirected from STDOUT, so you have to use an appropriate command in your script to effectively return the result.

```
x=system('ruby -e "puts 1+1"', intern=TRUE)
x=system('perl -e "print 2 + 4"', intern=TRUE)
x=system('C:\\jython2.2.1\\jython -c "print 1+3"',
intern=TRUE)
```

Obviously not a great approach for a full blown application, but a good "quick and dirty" solution to pass a bit of data between programming language environments.

Oh and by the way you can execute a source file (don't be confused by the fact that all of the examples above are simple interactive evaluation of expressions). Just make sure that the last line is outputting the value's you want to assign to your variable

```
x=system('ruby calc.rb', intern=TRUE)
```

Share / Save

Posted by C at 3:44 PM
Labels: R Environment, Ruby

0 comments:

Post a Comment

Date and Time in R
Plotting BP Oil Spill Testing Data using R
Data Mining with WEKA example implemented in R
3 lines of R code to Process a Web Service
Plotting World Bank Data with R
Ruby Script to parse ISBNs listed in R-Project to...
The 1000 most-visited sites analyzed using R
Free Online Statistics Books
"Programming with Data - a Guide to the S Language...
GUI chart formatting with playwith
Introductory Statistics with R
RODM: An R package for Oracle Data Mining
Color Palettes in R

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