



Introduction to R

What is R?

An environment that combines:

- effective handling of big data
- collection of integrated tools
- graphical facilities
- simple and effective programming language

Visualization

Open source

Data science



Platform agnostic

**Computational
statistics**

R packages

- collections of R functions, data, and compiled code in a well-defined format
- base packages come with R installation
- additional packages for specific functionality
- 7,000+ user contributed packages and growing



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[A3](#)
[abbyyR](#)
[abc](#)
[ABCanalysis](#)
[abc.data](#)
[abcdeFBA](#)
[ABCOptim](#)
[ABCp2](#)
[abcrf](#)

Available CRAN Packages By Name

[A](#)[B](#)[C](#)[D](#)[E](#)[F](#)[G](#)[H](#)[I](#)[J](#)[K](#)[L](#)[M](#)[N](#)[O](#)[P](#)[Q](#)[R](#)[S](#)[T](#)[U](#)[V](#)[W](#)[X](#)[Y](#)[Z](#)

Accurate, Adaptable, and Accessible Error Metrics for Predictive Models
Access to Abbyy Optical Character Recognition (OCR) API
Tools for Approximate Bayesian Computation (ABC)
Computed ABC Analysis
Data Only: Tools for Approximate Bayesian Computation (ABC)
ABCDE_FBA: A-Biologist-Can-Do-Everything of Flux Balance Analysis with this package
Implementation of Artificial Bee Colony (ABC) Optimization
Approximate Bayesian Computational Model for Estimating P2
Approximate Bayesian Computation via Random Forests

CRAN (Comprehensive R Archive Network)

- a repository for packages; source available for download or install directly within R



- An alternative package repository; “..provides tools for the analysis and comprehension of *high-throughput genomic data*.”
- Includes (but is not limited to) tools for:
 - ✦ performing statistical analysis
 - ✦ accessing public datasets
- Open source and open development
- Free

www.bioconductor.org



Integrated Development Environment (IDE)

- Graphical user interface, not just a command prompt
- Great learning tool
- Free for academic use
- Program agnostic
- Open source

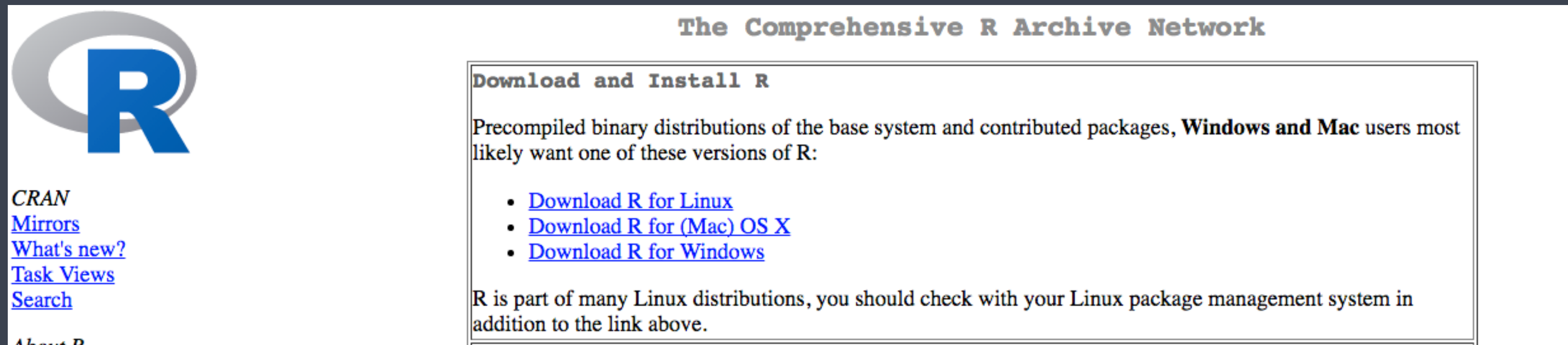
www.rstudio.com

Learning objectives

- How to interact with R using RStudio
- Become familiar with R syntax
- Understand data structures in R
- Inspect and manipulate data structures
- Install packages and use functions in R
- Visualize data using simple and complex plotting methods

Installations


- R: <https://cran.r-project.org/>



The screenshot displays the CRAN (Comprehensive R Archive Network) website. On the left, there is a navigation menu with links: [CRAN](#), [Mirrors](#), [What's new?](#), [Task Views](#), [Search](#), and [About R](#). The main content area is titled "The Comprehensive R Archive Network". Below this title, there is a section titled "Download and Install R". This section contains the text: "Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:". Following this text is a bulleted list of three links: [Download R for Linux](#), [Download R for \(Mac\) OS X](#), and [Download R for Windows](#). At the bottom of this section, it states: "R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above."

Installations

- RStudio: <https://www.rstudio.com/products/rstudio/download/>



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Installers for Supported Platforms

Installers	Size	Date	MD5
RStudio 0.99.902 - Windows Vista/7/8/10	77.1 MB	2016-05-14	8feae61d13b1d81ded7587a1da760d95
RStudio 0.99.902 - Mac OS X 10.6+ (64-bit)	60 MB	2016-05-14	f741e4a1345985c16e692967adbad210
RStudio 0.99.902 - Ubuntu 12.04+/Debian 8+ (32-bit)	81.6 MB	2016-05-14	363952616a10553aa51f3a9129b9adeb
RStudio 0.99.902 - Ubuntu 12.04+/Debian 8+ (64-bit)	88.3 MB	2016-05-14	d035622f39928246048972ed2064c89a
RStudio 0.99.902 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)	81 MB	2016-05-14	6f14d4717b01e7763d18f1cdad8e6474
RStudio 0.99.902 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)	81.9 MB	2016-05-14	af9e8cd892a497a92aafef8629f90e90

Zip/Tarballs

Zip/tar archives	Size	Date	MD5
RStudio 0.99.902 - Windows Vista/7/8/10	110.6 MB	2016-05-14	efbc09f98fd516cb39933ab1a4fddb01
RStudio 0.99.902 - Ubuntu 12.04+/Debian 8+ (32-bit)	82.3 MB	2016-05-14	3d66491350c64c86eabcde49e05f9d20
RStudio 0.99.902 - Ubuntu 12.04+/Debian 8+ (64-bit)	89.2 MB	2016-05-14	5312671c351728ea55a3a346f9a141e6
RStudio 0.99.902 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (32-bit)	81.6 MB	2016-05-14	7d856f34737844345b5e878ff92c900f
RStudio 0.99.902 - Fedora 19+/RedHat 7+/openSUSE 13.1+ (64-bit)	82.8 MB	2016-05-14	766e44a8dc891d671aa99c8bb784cac3