

# INTRODUCTION TO R PROGRAMMING

MASTER COURSE FOR SPECIALTY 1-31 80 01 BIOLOGY

Practical class #1.

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# LIST OF PRACTICAL TASKS

## Task by task.

- ☐ Task #1: Installation of R on Windows.
- ☐ Task #2: Basic administration of R.
- ☐ Task #3: Handling with R workspace.
- ☐ Task #4: Life cycle of native R files.
- ☐ Task #5: Getting help on R issues.

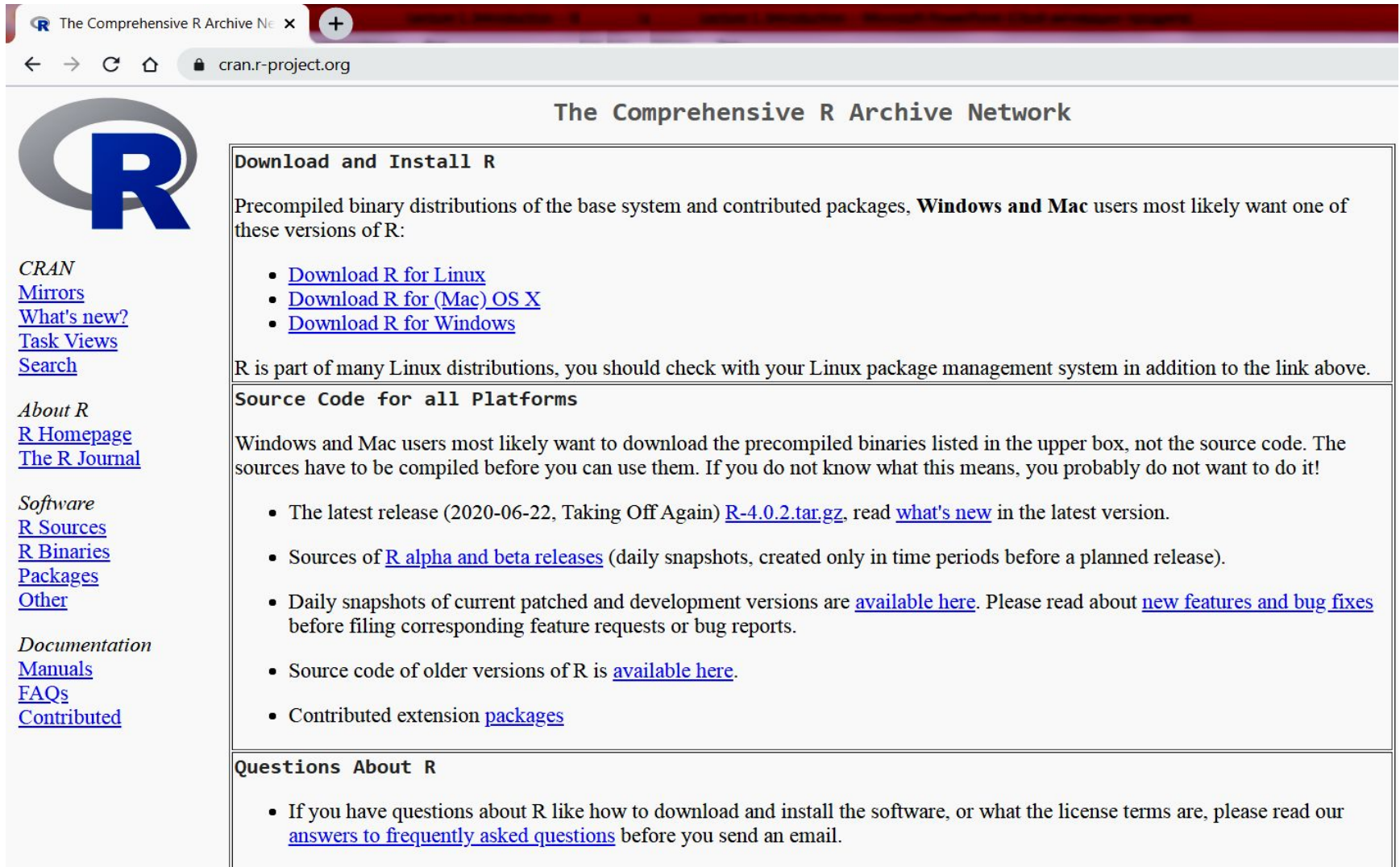
## Duration.

Eighty minutes (in total) per group of students.



# PRACTICAL TASK #1: Installation of R on Windows

## Start page of CRAN



The screenshot shows the CRAN website in a web browser. The browser's address bar displays 'cran.r-project.org'. The page features the CRAN logo on the left and a main content area on the right. The main content area is titled 'The Comprehensive R Archive Network' and contains three sections: 'Download and Install R', 'Source Code for all Platforms', and 'Questions About R'. Each section provides information and links for users to download and install R on their operating systems.

The Comprehensive R Archive Network

**Download and Install R**

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

**Source Code for all Platforms**

Windows and Mac users most likely want to download the precompiled binaries listed in the upper box, not the source code. The sources have to be compiled before you can use them. If you do not know what this means, you probably do not want to do it!

- The latest release (2020-06-22, Taking Off Again) [R-4.0.2.tar.gz](#), read [what's new](#) in the latest version.
- Sources of [R alpha and beta releases](#) (daily snapshots, created only in time periods before a planned release).
- Daily snapshots of current patched and development versions are [available here](#). Please read about [new features and bug fixes](#) before filing corresponding feature requests or bug reports.
- Source code of older versions of R is [available here](#).
- Contributed extension [packages](#)

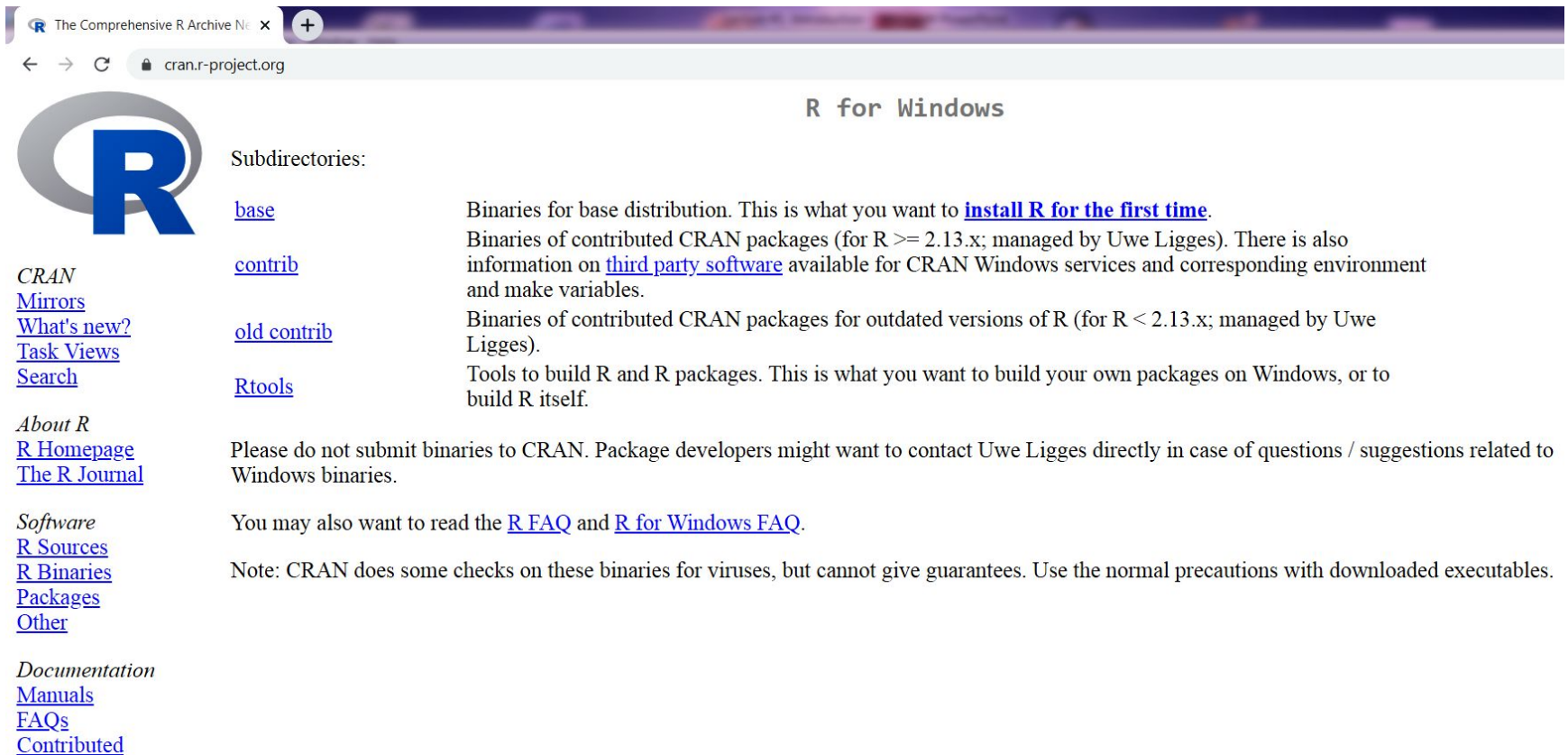
**Questions About R**

- If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

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

# PRACTICAL TASK #1: Installation of R on Windows

## R for Windows



The screenshot shows the CRAN R for Windows website. The browser address bar displays 'cran.r-project.org'. The page features the R logo on the left and the title 'R for Windows' on the right. Below the logo, there are links for 'CRAN', 'Mirrors', 'What's new?', 'Task Views', and 'Search'. To the right of these links, under the heading 'Subdirectories:', are links for 'base', 'contrib', 'old contrib', and 'Rtools'. The 'base' link is followed by a paragraph about installing R for the first time. The 'contrib' link is followed by a paragraph about contributed CRAN packages. The 'old contrib' link is followed by a paragraph about outdated versions of R. The 'Rtools' link is followed by a paragraph about building R and R packages. At the bottom, there are links for 'About R', 'R Homepage', 'The R Journal', 'Software', 'R Sources', 'R Binaries', 'Packages', 'Other', 'Documentation', 'Manuals', 'FAQs', and 'Contributed'.

The Comprehensive R Archive Net

cran.r-project.org

### R for Windows

Subdirectories:

- [base](#)  
Binaries for base distribution. This is what you want to [install R for the first time](#).
- [contrib](#)  
Binaries of contributed CRAN packages (for R  $\geq$  2.13.x; managed by Uwe Ligges). There is also information on [third party software](#) available for CRAN Windows services and corresponding environment and make variables.
- [old contrib](#)  
Binaries of contributed CRAN packages for outdated versions of R (for R  $<$  2.13.x; managed by Uwe Ligges).
- [Rtools](#)  
Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.

Please do not submit binaries to CRAN. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windows binaries.

You may also want to read the [R FAQ](#) and [R for Windows FAQ](#).

Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.

*CRAN*  
[Mirrors](#)  
[What's new?](#)  
[Task Views](#)  
[Search](#)

*About R*  
[R Homepage](#)  
[The R Journal](#)

*Software*  
[R Sources](#)  
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# PRACTICAL TASK #1: Installation of R on Windows

## R for Windows



CRAN

[Mirrors](#)

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About R

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[Other](#)

Documentation

[Manuals](#)

[FAQs](#)

[Contributed](#)

R-4.1.1 for Windows (32/64 bit)

### Download R 4.1.1 for Windows

[Installation and other instructions](#)

[New features in this version](#)

If you want to double-check that the package you have downloaded matches the package distributed by CRAN, you can compare the [md5sum](#) of the .exe to the [fingerprint](#) on the master server. You will need a version of md5sum for windows: both [graphical](#) and [command line versions](#) are available.

#### Frequently asked questions

- [Does R run under my version of Windows?](#)
- [How do I update packages in my previous version of R?](#)
- [Should I run 32-bit or 64-bit R?](#)

Please see the [R FAQ](#) for general information about R and the [R Windows FAQ](#) for Windows-specific information.

#### Other builds

- Patches to this release are incorporated in the [r-patched snapshot build](#).
- A build of the development version (which will eventually become the next major release of R) is available in the [r-devel snapshot build](#).
- [Previous releases](#)

Note to webmasters: A stable link which will redirect to the current Windows binary release is <http://<CRAN MIRROR>/bin/windows/base/release.html>.

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Last change: 2021-08-10

# PRACTICAL TASK #1: Installation of R on Windows

## R for Windows

Просмотр основных сведений о вашем компьютере

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Издание Windows


Windows 7 Максимальная

© Корпорация Майкрософт (Microsoft Corp.), 2009. Все права защищены.

Service Pack 1

---

Система

Оценка:  [Индекс производительности Windows](#)

Процессор: Intel(R) Core(TM) i5-4670K CPU @ 3.40GHz 3.40 GHz

Установленная память (ОЗУ): 8.00 ГБ (7.88 ГБ доступно)

Тип системы: 64-разрядная операционная система

Перо и сенсорный ввод: Перо и сенсорный ввод недоступны для этого экрана

---

Имя компьютера, имя домена и параметры рабочей группы

Компьютер: Гринев-ПК

Полное имя: Гринев-ПК

Описание:

Рабочая группа: WORKGROUP

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Активация Windows

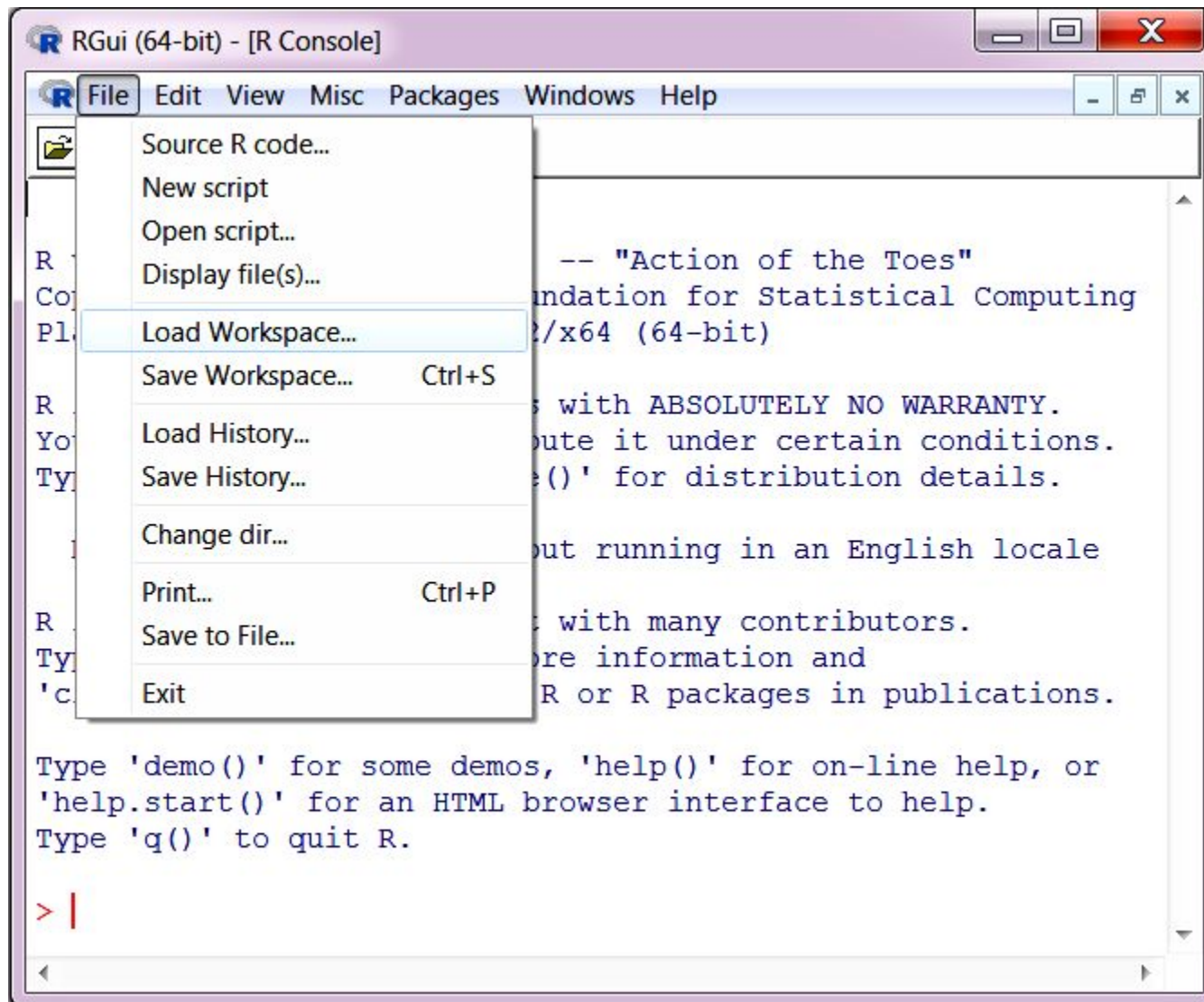
Активация Windows выполнена

Код продукта: 00426-OEM-8992662-00009



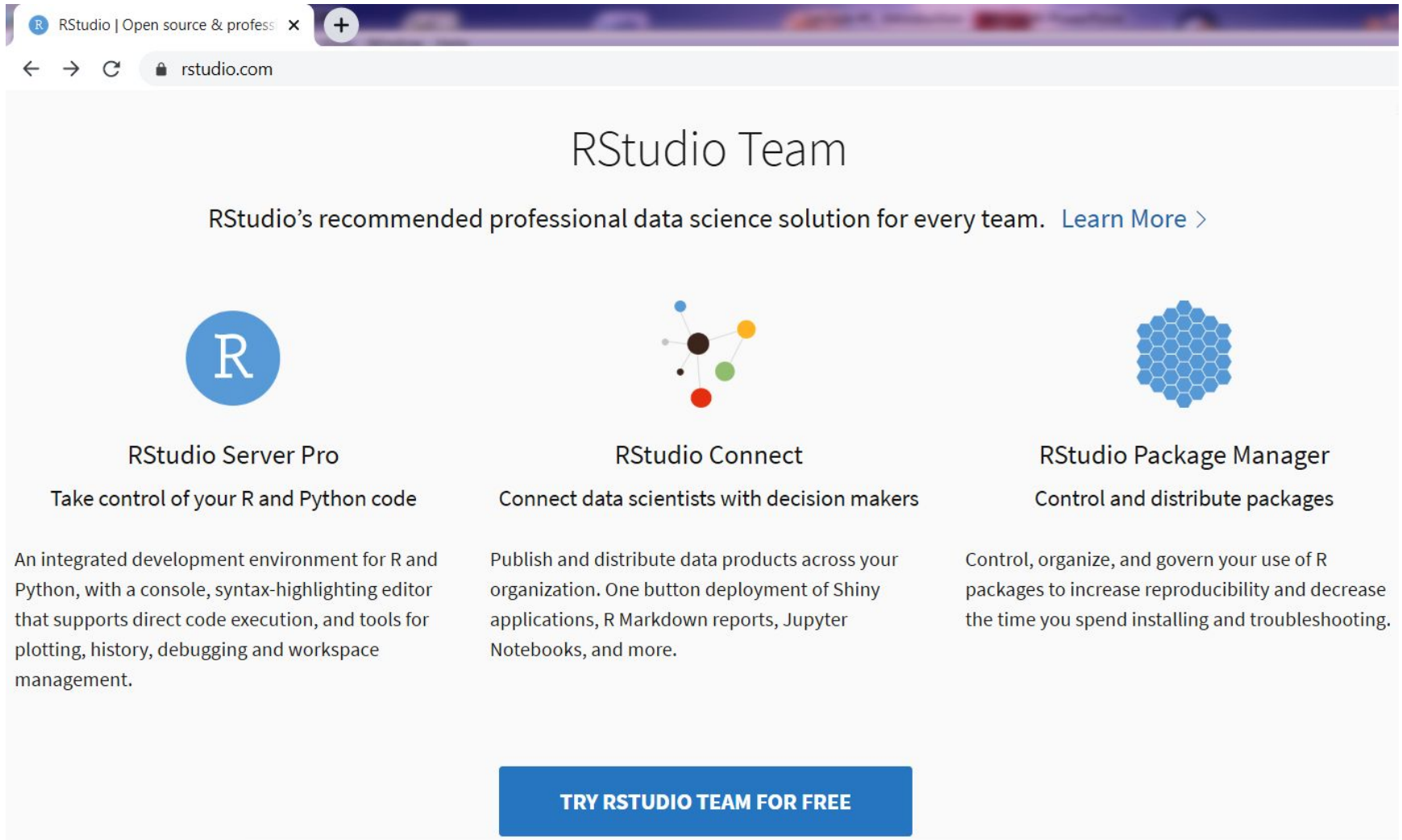
# PRACTICAL TASK #2: Basic administration of R

## R Console



# PRACTICAL TASK #2: Basic administration of R

## RStudio



The screenshot shows the RStudio Team website in a web browser. The browser's address bar displays 'rstudio.com'. The website's header features the 'RStudio Team' title and a link to 'Learn More >'. Below the header, three main product offerings are presented in a grid:

- RStudio Server Pro**: Take control of your R and Python code. An integrated development environment for R and Python, with a console, syntax-highlighting editor that supports direct code execution, and tools for plotting, history, debugging and workspace management.
- RStudio Connect**: Connect data scientists with decision makers. Publish and distribute data products across your organization. One button deployment of Shiny applications, R Markdown reports, Jupyter Notebooks, and more.
- RStudio Package Manager**: Control and distribute packages. Control, organize, and govern your use of R packages to increase reproducibility and decrease the time you spend installing and troubleshooting.

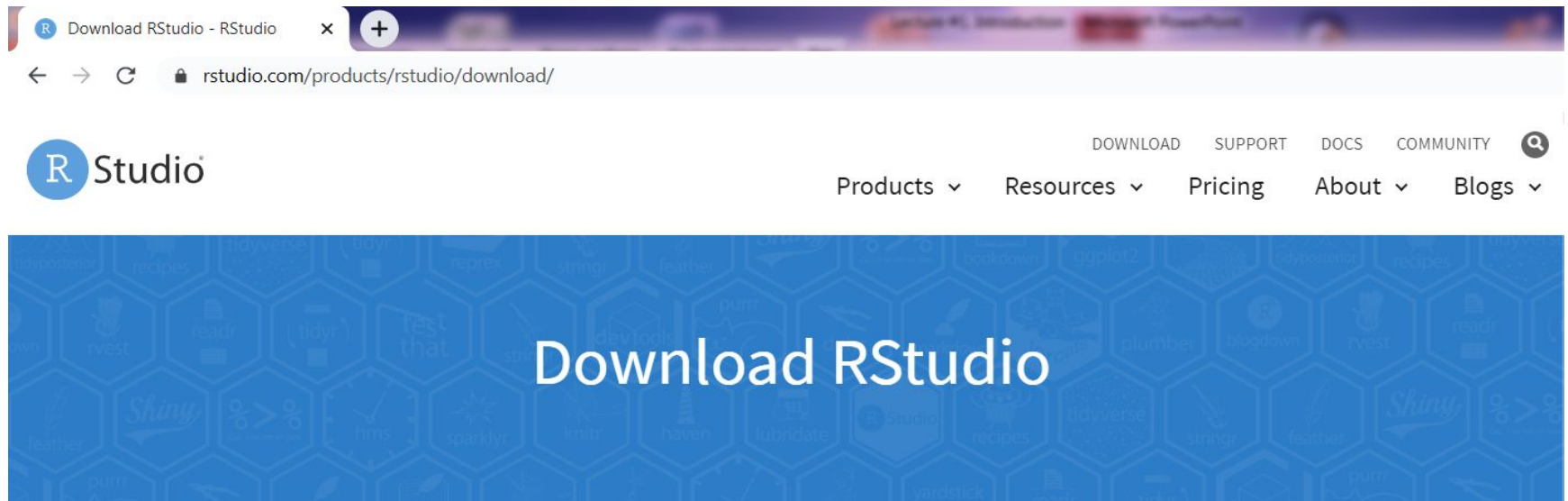
A blue button at the bottom center of the grid reads 'TRY RSTUDIO TEAM FOR FREE'.

<https://rstudio.com/>



# PRACTICAL TASK #2: Basic administration of R

## RStudio



## Choose Your Version

RStudio is a set of integrated tools designed to help you be more productive with R. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace.

[LEARN MORE ABOUT RSTUDIO FEATURES](#)

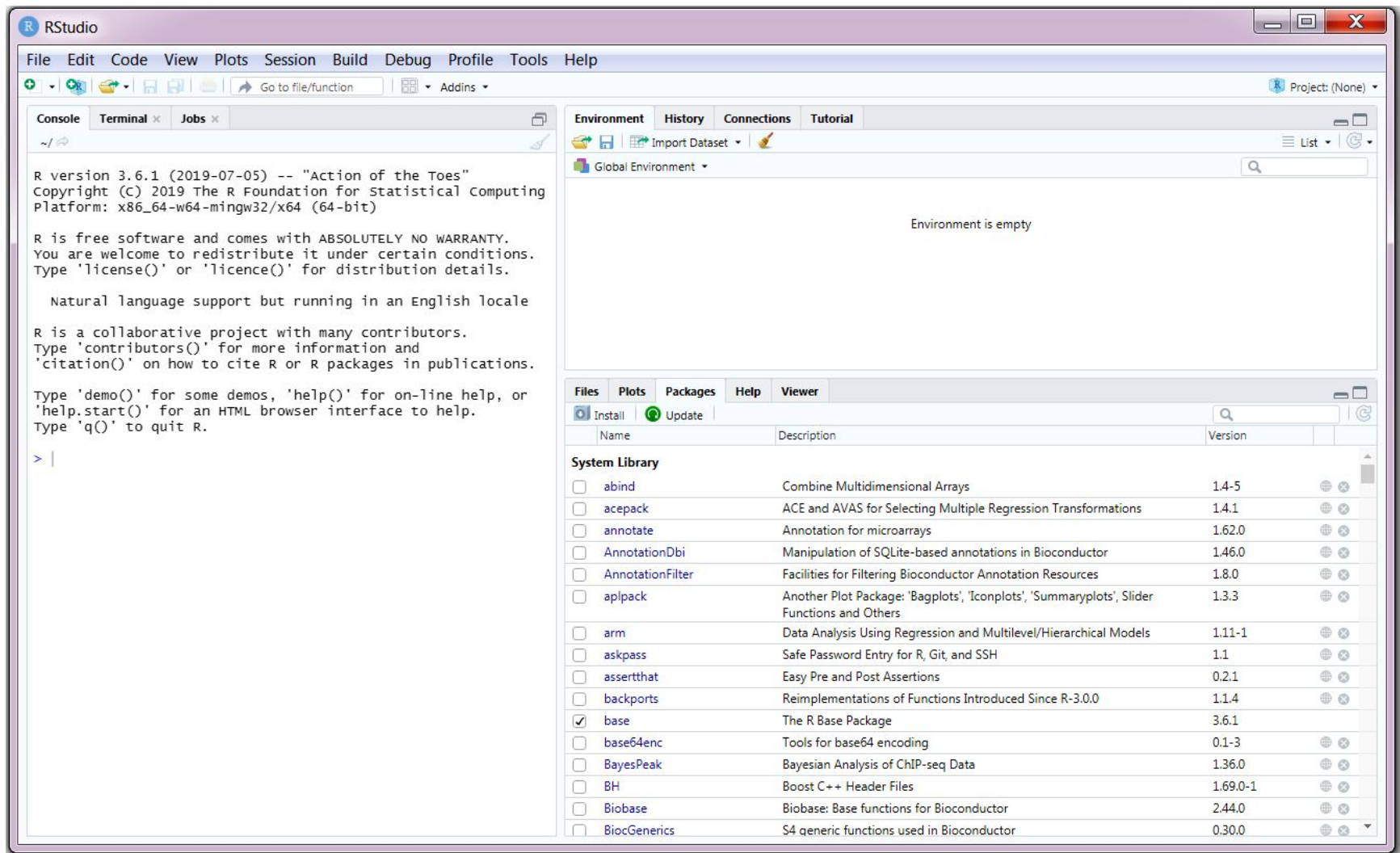


RStudio's new solution for every professional data science team. RStudio Team includes RStudio Server Pro, RStudio Connect and RStudio Package Manager.

[LEARN MORE](#)

# PRACTICAL TASK #2: Basic administration of R

## RStudio



# PRACTICAL TASK #2: Basic administration of R

## .Renviron

```
> Sys.getenv()
```

```
...  
APPDATA    C:\Users\Гринеv\AppData\Roaming  
...  
COMPUTERNAME  ГРИНЕВ-ПК  
...  
HOME  C:\Users\Гринеv\Documents  
HOMEDRIVE  C:  
HOMEPATH  \Users\Гринеv  
LOCALAPPDATA C:\Users\Гринеv\AppData\Local  
...  
R_HOME    D:/Software/R-4.1.1  
R_LIBS_USER  C:\Users\Гринеv\Documents\R/win-library/4.1  
...  
TEMP  C:\Users\6416~1\AppData\Local\Temp  
TMP   C:\Users\6416~1\AppData\Local\Temp  
...  
USERNAME Гринеv
```

# PRACTICAL TASK #2: Basic administration of R

## .Renviron

C:\Users\user\_name\Documents

TMP = 'D:\Software\R-4.1.1\Temp'

APPDATA = 'D:\Software\R-4.1.1\AppData'

LOCALAPPDATA = 'D:\Software\R-4.1.1\AppData\Local'

TEMP = 'D:\Software\R-4.1.1\AppData\Local\Temp'

HOME = 'D:\Software\R-4.1.1\Documents'

R\_LIBS\_USER = 'D:\Software\R-4.1.1\library\user'

```
> Sys.getenv("TEMP")
```

```
[1] "C:\\Users\\6416~1\\AppData\\Local\\Temp"
```

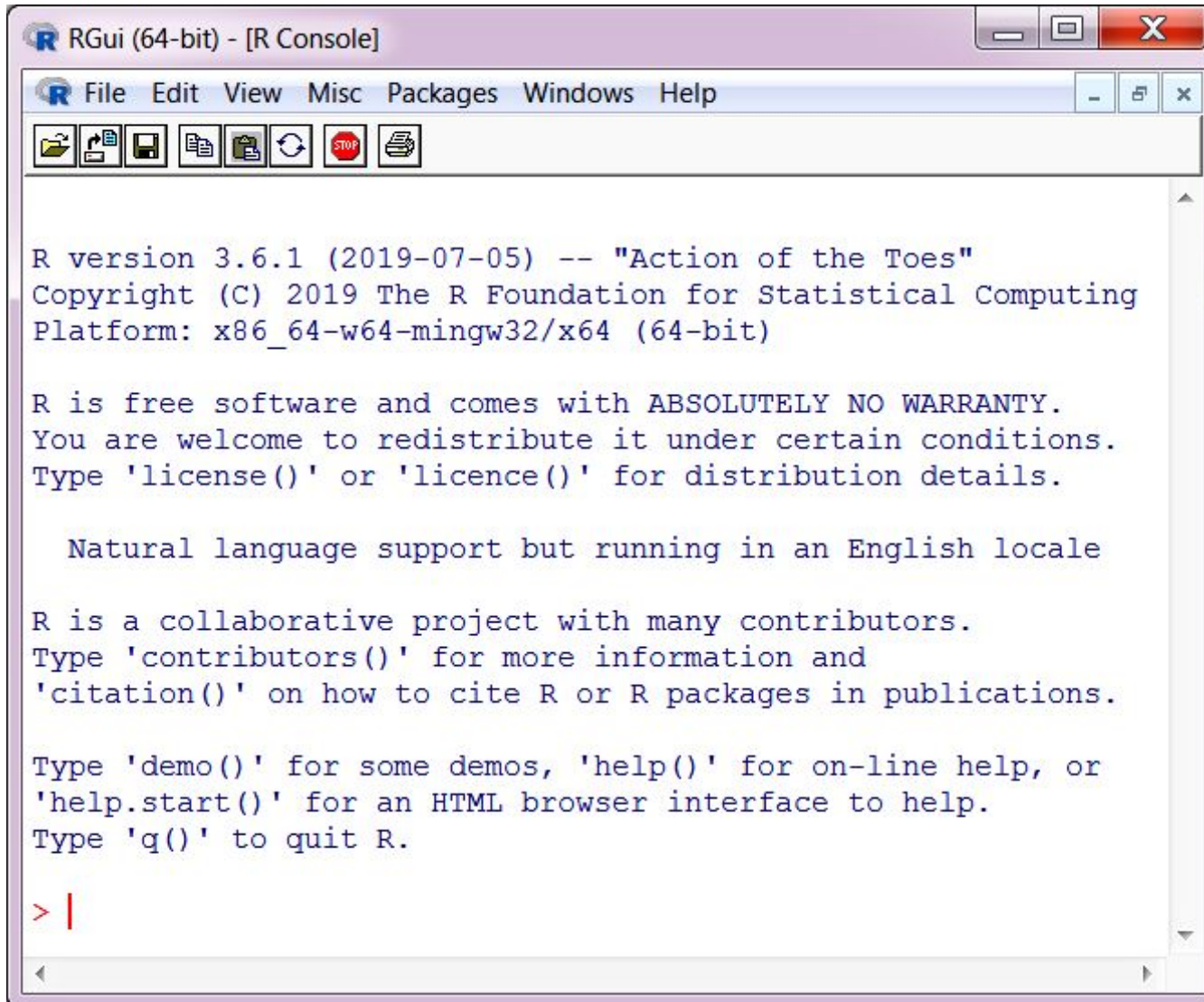
```
> Sys.getenv("TEMP")
```

```
[1] "D:\\Software\\R-4.1.1\\AppData\\Local\\Temp"
```



# PRACTICAL TASK #2: Basic administration of R

## R version



The screenshot shows the RGui (64-bit) - [R Console] window. The title bar includes the R logo and window controls. The menu bar contains File, Edit, View, Misc, Packages, Windows, and Help. Below the menu bar is a toolbar with icons for file operations and execution. The main console area displays the R startup message, which includes the version number (3.6.1), release date (2019-07-05), copyright information, platform details (x86\_64-w64-mingw32/x64), and instructions for using the software. The prompt character is a red greater-than sign followed by a vertical bar (> |).

```
RGui (64-bit) - [R Console]

File Edit View Misc Packages Windows Help

R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> |
```

# PRACTICAL TASK #2: Basic administration of R

## R version



CRAN

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[What's new?](#)

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[Packages](#)

[Other](#)

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[Manuals](#)

[FAQs](#)

[Contributed](#)

R-4.1.1 for Windows (32/64 bit)

[Download R 4.1.1 for Windows](#) (86 megabytes, 32/64 bit)

[Installation and other instructions](#)

[New features in this version](#)

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Last change: 2021-08-10

# PRACTICAL TASK #2: Basic administration of R

## R version

Calling of current R version from command console.

```
> R.Version()$version.string  
[1] "R version 4.1.1 (2021-08-10)"
```

Updating R from command console using the package *installr*. The main work horse of this package is function `updateR()`. This function performs the following: finding the latest R version, downloading it, running the installer, deleting the installation file, copy and updating old packages to the new R installation.

### Installing the package

```
> install.packages(pkgs="installr")
```

### Loading the package

```
> suppressMessages(expr=library(package=installr))
```

### Using the package

```
> updateR()
```

**CRAN** [cran.r-project.org/web/packages/installr/index.html](https://cran.r-project.org/web/packages/installr/index.html)

**Tutorial** [r-statistics.com/2013/03/updating-r-from-r-on-windows-using-the-installr-package](https://r-statistics.com/2013/03/updating-r-from-r-on-windows-using-the-installr-package)

# PRACTICAL TASK #2: Basic administration of R

## R version

**Old versions** of R at <https://cran.r-project.org/bin/windows/base/old>

### Previous Releases of R for Windows

This directory contains previous binary releases of R for Windows.

The current release, and links to development snapshots, are available [here](#). Source code for these releases and others is available through [the main CRAN page](#).

In this directory:

[R 4.1.1](#) (August, 2021)  
[R 4.1.0](#) (May, 2021)  
[R 4.0.5](#) (March, 2021)  
[R 4.0.4](#) (February, 2021)  
[R 4.0.3](#) (October, 2020)  
[R 4.0.2](#) (June, 2020)  
[R 4.0.1](#) (June, 2020)  
[R 4.0.0](#) (April, 2020)  
[R 3.6.3](#) (February, 2020)  
[R 3.6.2](#) (December, 2019)  
[R 3.6.1](#) (July, 2019)  
[R 3.6.0](#) (April, 2019)  
[R 3.5.3](#) (March, 2019)  
[R 3.5.2](#) (December, 2018)  
[R 3.5.1](#) (July, 2018)  
[R 3.5.0](#) (April, 2018)  
[R 3.4.4](#) (March, 2018)  
[R 3.4.3](#) (November, 2017)  
[R 3.4.2](#) (September, 2017)  
[R 3.4.1](#) (June, 2017)  
[R 3.4.0](#) (April, 2017)  
[R 3.3.3](#) (March, 2017)



# PRACTICAL TASK #3: Handling with R workspace

## Basic definitions

The **workspace** is current R working environment. It includes any **user-defined objects** (vectors, matrices, data frames, lists, functions). At the end of an R session, the user can save an image of the current workspace that is automatically reloaded the next time R is started.

Some standard commands for managing R workspace:

### Get work directory

```
> getwd()
```

```
[1] "C:/Users/Гринеv/Documents"
```

### Set custom work directory

```
> setwd(dir="D:/Vasily Grinev")
```

```
> getwd()
```

```
[1] "D:/Vasily Grinev"
```

### List the objects in the current workspace

```
> ls()
```

```
character(0)
```

# PRACTICAL TASK #3: Handling with R workspace

## Session info

> sessionInfo()

R version 4.1.1 (2021-08-10)

Platform: x86\_64-w64-mingw32/x64 (64-bit)

Running under: Windows 7 x64 (build 7601) Service Pack 1

Matrix products: default

locale:

[1] LC\_COLLATE=English\_United States.1252

[2] LC\_CTYPE=English\_United States.1252

[3] LC\_MONETARY=English\_United States.1252

[4] LC\_NUMERIC=C

[5] LC\_TIME=English\_United States.1252

system code page: 1251

attached base packages:

[1] stats    graphics    grDevices    utils    datasets    methods    base

loaded via a namespace (and not attached):

[1] compiler\_3.6.1

# PRACTICAL TASK #3: Handling with R workspace

## Options

**Options** are **global parameters** that affect the way in which R computes and displays its results. Just one example:

```
> options("digits")
```

```
$digits
```

```
[1] 7
```

```
> 3/4.5
```

```
[1] 0.6666667
```

### The names of the options

```
> names(x=options())
```

```
[1] "add.smooth" "askYesNo"
```

```
[3] "browserNLdisabled" "CBoundsCheck"
```

```
[5] "check.bounds" "citation.bibtex.max"
```

```
[7] "continue" "contrasts"
```

```
[9] "defaultPackages" "demo.ask"
```

```
[11] "deparse.cutoff" "device"
```

```
[13] "device.ask.default" "digits"
```

```
[15] "echo" "editor"
```

```
[17] "encoding" "example.ask"
```

```
...
```

# PRACTICAL TASK #3: Handling with R workspace

## Options

### View current (default) options settings

```
>options()
```

```
$add.smooth
```

```
[1] TRUE
```

```
$askYesNo
```

```
function (msg, ...)
```

```
{
```

```
  flush.console()
```

```
  ans <- winDialog("yesnocancel", msg)
```

```
  switch(ans, YES = TRUE, NO = FALSE, NA)
```

```
}
```

```
<bytecode: 0x000000000097acd40>
```

```
<environment: namespace:utils>
```

```
$browserNLdisabled
```

```
[1] FALSE
```

```
...
```



# PRACTICAL TASK #3: Handling with R workspace

## Options

```
> options("digits")
```

```
$digits
```

```
[1] 7
```

```
> getOption(x="digits")
```

```
[1] 7
```

```
### Re-settings of option value
```

```
> options(digits=4)
```

```
> 3/4.5
```

```
[1] 0.6667
```

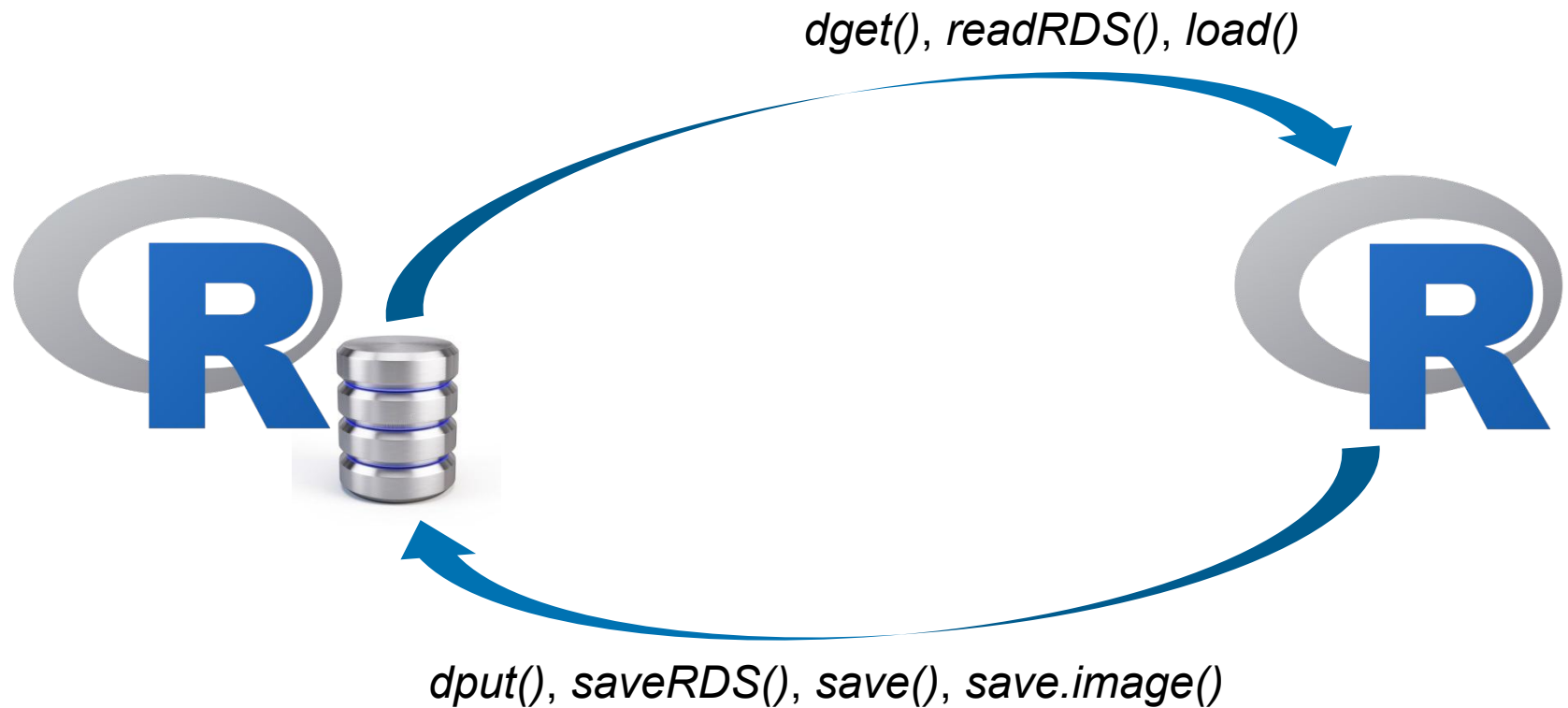
```
> options(digits=20)
```

```
> 3/4.5
```

```
[1] 0.66666666666666666663
```

# PRACTICAL TASK #4: Life cycle of native R files

## Native R files



```
> saveRDS(object=my_R_object,  # R object to serialize  
           file="my_R_object.rds") # the name of the file where the  
           # R object is saved to  
> readRDS(file="my_R_object.rds") # the name of the file where the  
           # R object is read from
```

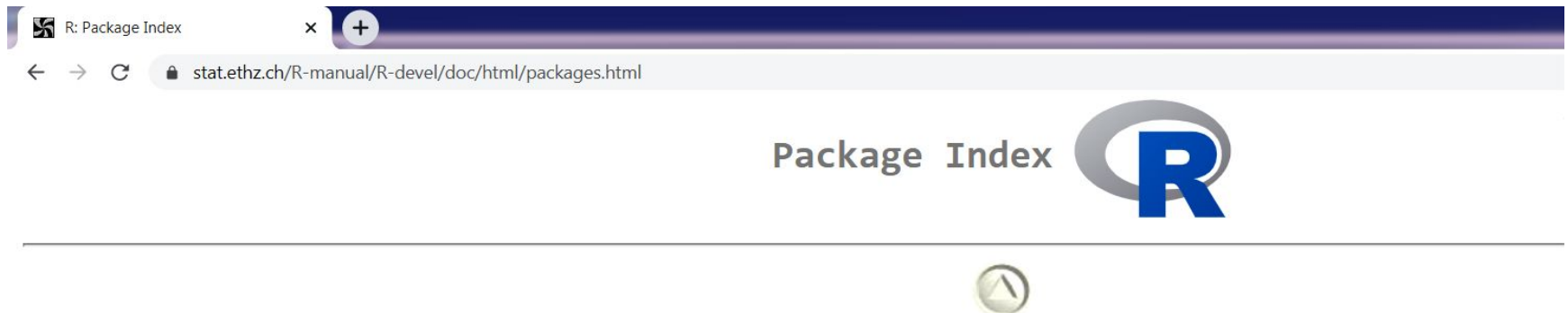
# PRACTICAL TASK #4: Life cycle of native R files

## Built-in functions

- ☐ *dget()* – reads in active memory of single R object from the R text file;
- ☐ *load()* – reads the R environment objects;
- ☐ *readRDS()* – reads a single R object from \*.RDS file.
  
- ☐ *dput()* – write an R object to a text file or connection;
- ☐ *dump()* – write R objects into a text file;
- ☐ *save()* – write an object of the R environment into a text file;
- ☐ *save.image()* – write a current R workspace in .rdata file;
- ☐ *saveRDS()* – write a single R object to a file.

# PRACTICAL TASK #5: Getting help on R issues

## Packages in the standard R library



### Packages in the standard library

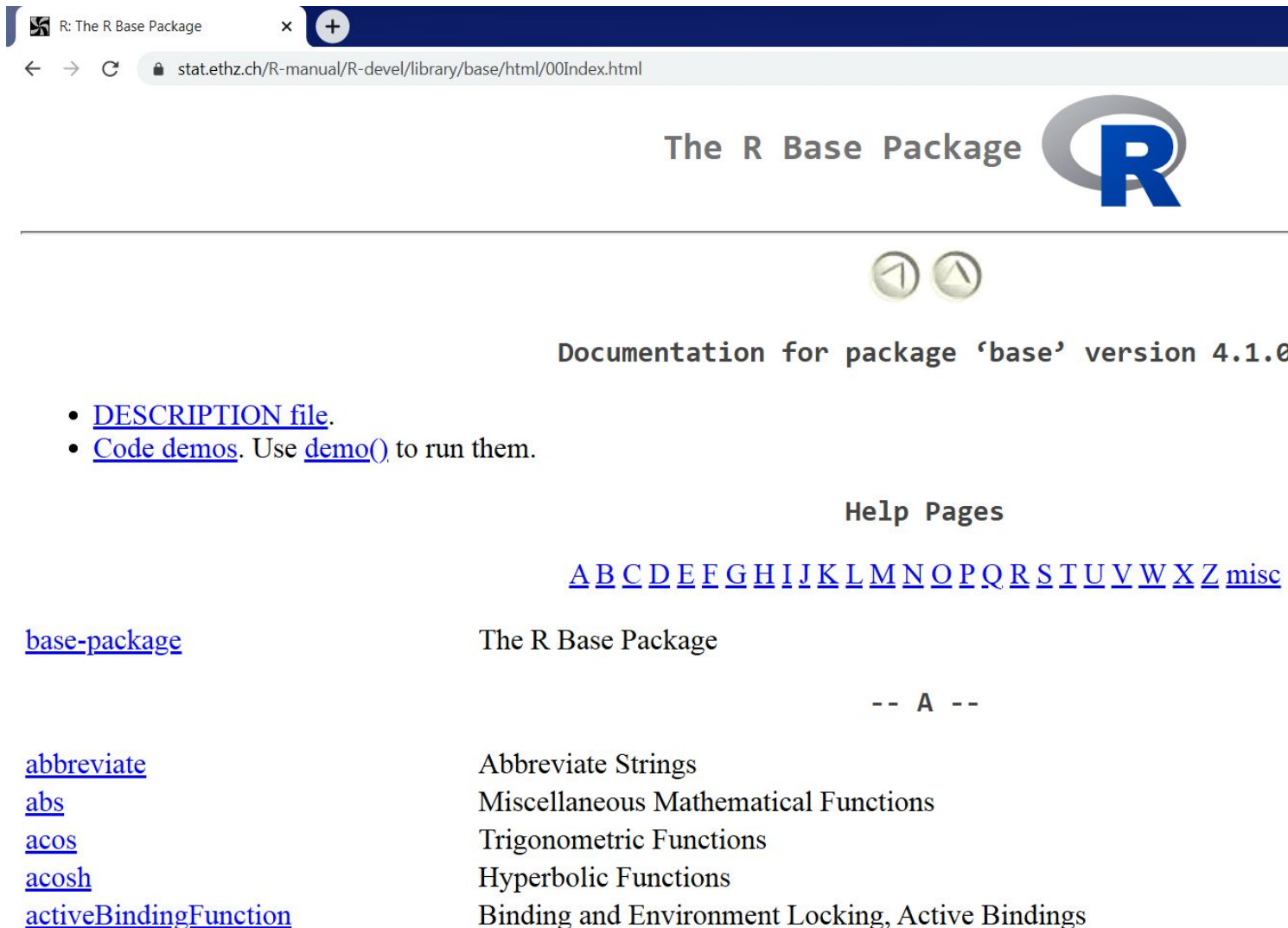
<a href="#">base</a>	The R Base Package
<a href="#">boot</a>	Bootstrap Functions (Originally by Angelo Canty for S)
<a href="#">class</a>	Functions for Classification
<a href="#">cluster</a>	"Finding Groups in Data": Cluster Analysis Extended Rousseeuw et al.
<a href="#">codetools</a>	Code Analysis Tools for R
<a href="#">compiler</a>	The R Compiler Package
<a href="#">datasets</a>	The R Datasets Package
<a href="#">foreign</a>	Read Data Stored by 'Minitab', 'S', 'SAS', 'SPSS', 'Stata', 'Systat', 'Weka', 'dBase', ...
<a href="#">graphics</a>	The R Graphics Package
<a href="#">grDevices</a>	The R Graphics Devices and Support for Colours and Fonts
<a href="#">grid</a>	The Grid Graphics Package
<a href="#">KernSmooth</a>	Functions for Kernel Smoothing Supporting Wand & Jones (1995)
<a href="#">lattice</a>	Trellis Graphics for R
<a href="#">MASS</a>	Support Functions and Datasets for Venables and Ripley's MASS

[stat.ethz.ch/R-manual/R-devel/doc/html/packages.html](http://stat.ethz.ch/R-manual/R-devel/doc/html/packages.html)



# PRACTICAL TASK #5: Getting help on R issues

## Package description page



The screenshot shows a web browser window with the title "R: The R Base Package" and a tab icon. The address bar shows the URL "stat.ethz.ch/R-manual/R-devel/library/base/html/00Index.html". The page content includes the title "The R Base Package" with the R logo, a horizontal line, and two circular icons. Below this, it says "Documentation for package 'base' version 4.1.0". There are two bullet points: "DESCRIPTION file." and "Code demos. Use demo() to run them." followed by a "Help Pages" section with a list of links from A to Z and a "misc" link. A table with two columns follows, listing various R functions and their descriptions. The first column contains links like "base-package", "abbreviate", "abs", "acos", "acosh", and "activeBindingFunction". The second column contains descriptions like "The R Base Package", "Abbreviate Strings", "Miscellaneous Mathematical Functions", "Trigonometric Functions", "Hyperbolic Functions", and "Binding and Environment Locking, Active Bindings".

R: The R Base Package

stat.ethz.ch/R-manual/R-devel/library/base/html/00Index.html

### The R Base Package

---

Documentation for package 'base' version 4.1.0

- [DESCRIPTION file](#).
- [Code demos](#). Use [demo\(\)](#) to run them.

#### Help Pages

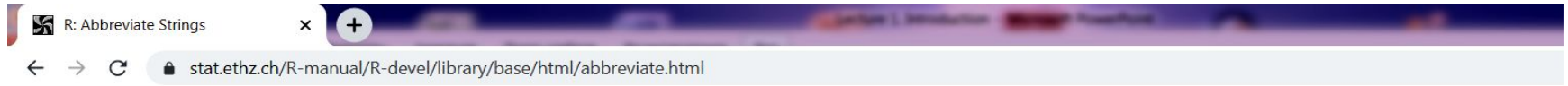
[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) [misc](#)

<a href="#">base-package</a>	The R Base Package
-- A --	
<a href="#">abbreviate</a>	Abbreviate Strings
<a href="#">abs</a>	Miscellaneous Mathematical Functions
<a href="#">acos</a>	Trigonometric Functions
<a href="#">acosh</a>	Hyperbolic Functions
<a href="#">activeBindingFunction</a>	Binding and Environment Locking, Active Bindings

<https://stat.ethz.ch/R-manual/R-devel/library/base/html/00Index.html>

# PRACTICAL TASK #5: Getting help on R issues

## Function description page



`abbreviate {base}`

### Abbreviate Strings

#### Description

Abbreviate strings to at least `minlength` characters, such that they remain *unique* (if they were), unless `strict = TRUE`.

#### Usage

```
abbreviate(names.arg, minlength = 4, use.classes = TRUE,  
           dot = FALSE, strict = FALSE,  
           method = c("left.kept", "both.sides"), named = TRUE)
```

#### Arguments

`names.arg`  
a character vector of names to be abbreviated, or an object to be coerced to a character vector by [as.character](#).

`minlength`  
the minimum length of the abbreviations.

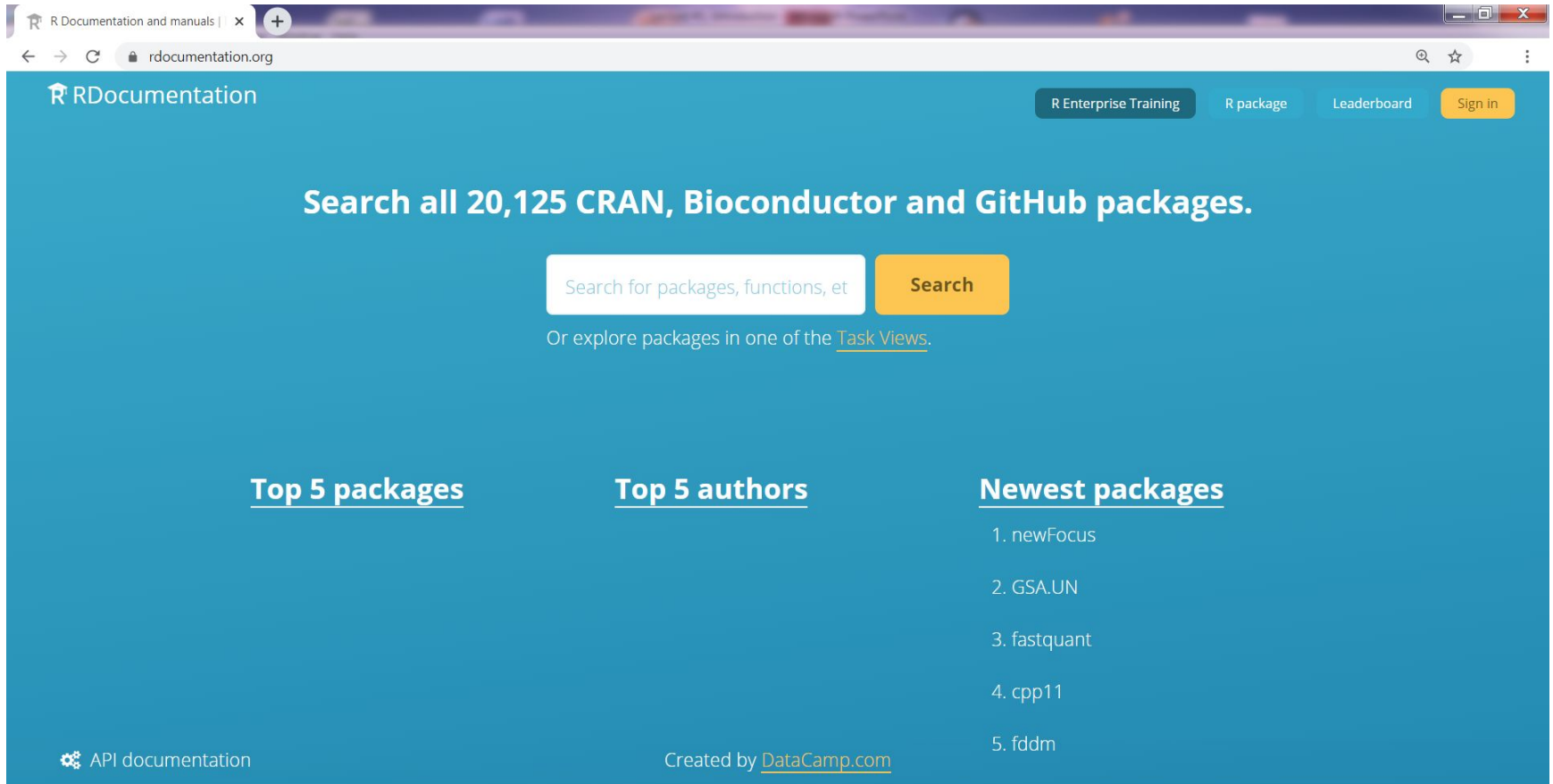
`use.classes`  
logical: should lowercase characters be removed first?

`dot`  
logical: should a dot (".") be appended?

<https://stat.ethz.ch/R-manual/R-devel/library/base/html/abbreviate.html>

# PRACTICAL TASK #5: Getting help on R issues

## R documentation



The screenshot shows the RDocumentation website homepage. The browser address bar displays 'rdocumentation.org'. The page has a blue header with the 'RDocumentation' logo on the left and navigation links ('R Enterprise Training', 'R package', 'Leaderboard', 'Sign in') on the right. The main content area is also blue and features a large search prompt: 'Search all 20,125 CRAN, Bioconductor and GitHub packages.' Below this is a search input field with the placeholder text 'Search for packages, functions, et' and a yellow 'Search' button. A link to 'Task Views' is provided below the search field. At the bottom of the main area, there are three sections: 'Top 5 packages', 'Top 5 authors', and 'Newest packages'. The 'Newest packages' section lists five items: 1. newFocus, 2. GSA.UN, 3. fastquant, 4. cpp11, and 5. fddm. The footer contains a link to 'API documentation' and a note 'Created by DataCamp.com'.

RDocumentation

R Enterprise Training R package Leaderboard Sign in

Search all 20,125 CRAN, Bioconductor and GitHub packages.

Search for packages, functions, et Search

Or explore packages in one of the [Task Views](#).

[Top 5 packages](#) [Top 5 authors](#) [Newest packages](#)

1. newFocus  
2. GSA.UN  
3. fastquant  
4. cpp11  
5. fddm

API documentation Created by [DataCamp.com](#)

<https://www.rdocumentation.org/>

# PRACTICAL TASK #5: Getting help on R issues

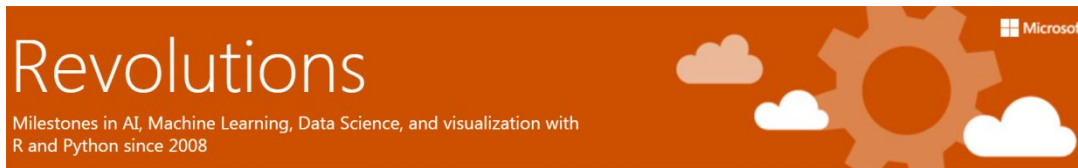
## R community: blogs and blog aggregators

 **R-bloggers** (<https://www.r-bloggers.com>)

R-Bloggers is a blog aggregator of content contributed by bloggers who write about R.

 **RStudio Community** (<https://community.rstudio.com>)

RStudio Community is a blog aggregator for all things R and RStudio.



(<https://blog.revolutionanalytics.com/about.html>)

Revolutions is a blog dedicated to news and information of interest to members of the R community

 **R-exercises** (<https://www.r-exercises.com/>)

R-exercises aims to help people develop and improve their R programming skills



(<https://r-analytics.blogspot.com/>)

Этот блог посвящен языку программирования и системе статистических

# PRACTICAL TASK #5: Getting help on R issues

## Internal R documentation

#### List of installed packages

```
> attr(installed.packages()[, 1], "names")
```

#### Get help on a package

```
> ?base
```

```
> library(help="base")
```

#### Get help on a function

```
> ls(pos="package:base")
```

```
> ?sqrt
```

```
> ??abs
```

#### Get help on an operator

```
> ?"+"
```

```
> ??"+"
```



# THANKS FOR YOUR ATTENTION!

