

R Programming For Beginners

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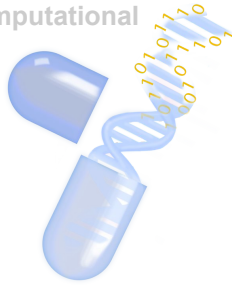
@ArvidMer



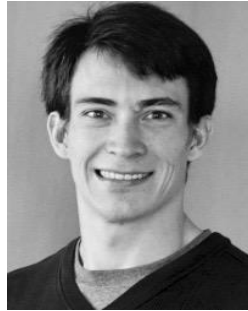
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Petr Smirnov



Ian Smith

Helping Us



Ali Madani

About This Workshop

- Aimed towards people who don't have any prior experience in programming
- R and RStudio is installed
- You will learn by doing
- Course material can be used as reference
- At the end of this workshop, you will not be an expert in R but you will be comfortable in R

Introduction to R





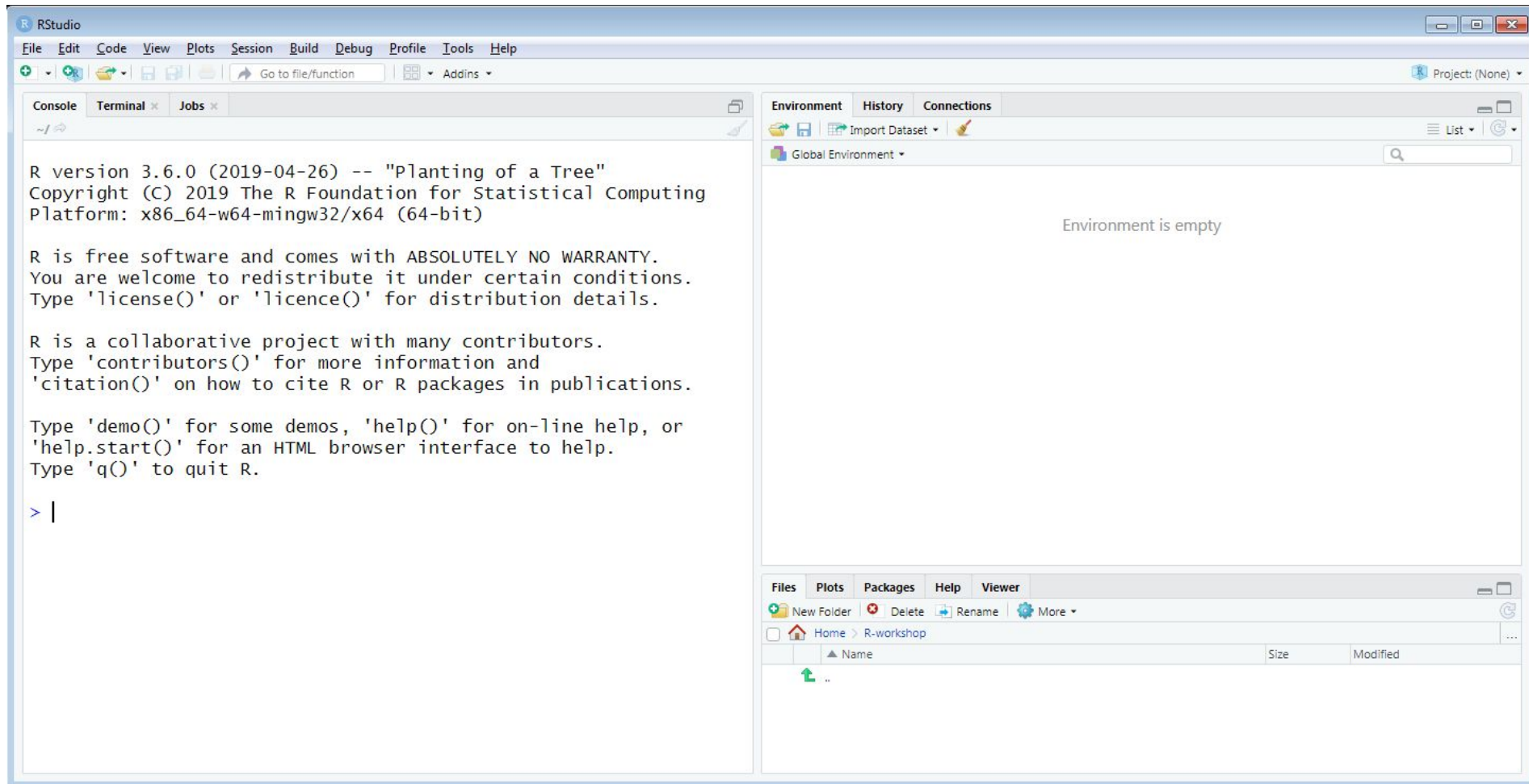
What is R?

- R is a programming language focused on statistical analysis and data visualization

Why R?

- R is great because:
 - It is 100% free
 - R codes are transparent, shareable and reproducible
 - R is interpreted type of programming language
 - R has a huge community base
 - 1000s of packages are available
 - Popular among Bioinformaticians and (Bio)Statisticians

RStudio



RStudio

Console

The screenshot displays the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and a search bar. The main interface is divided into three panels. The left panel, labeled 'Console', contains the R startup message and a prompt. The right panel, labeled 'Environment', shows the 'Global Environment' and states 'Environment is empty'. The bottom panel, labeled 'Files', shows the file explorer for the 'R-workshop' directory.

R version 3.6.0 (2019-04-26) -- "Planting of a Tree"
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.

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.

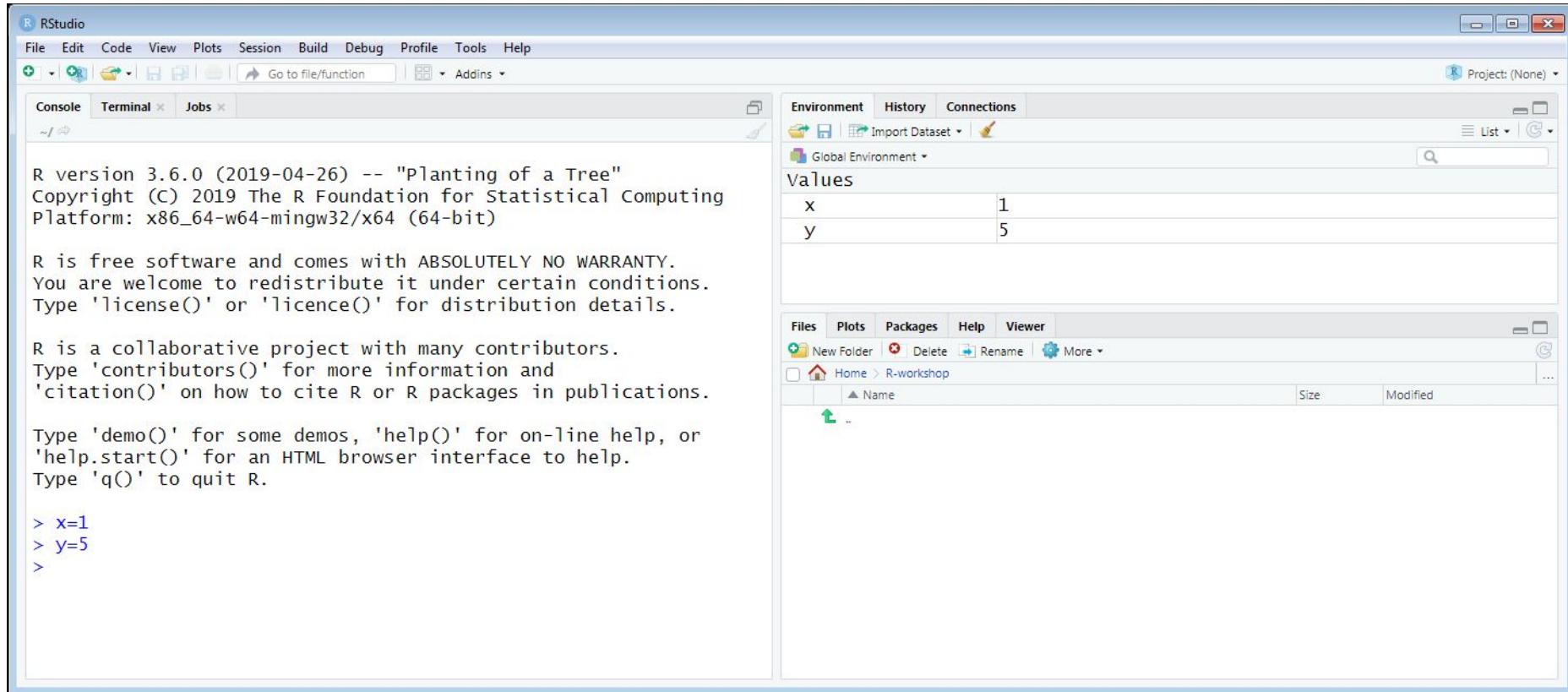
> |

Environment History Connections
Global Environment
Environment is empty

Files Plots Packages Help Viewer
New Folder Delete Rename More
Home > R-workshop
Name Size Modified
..

RStudio

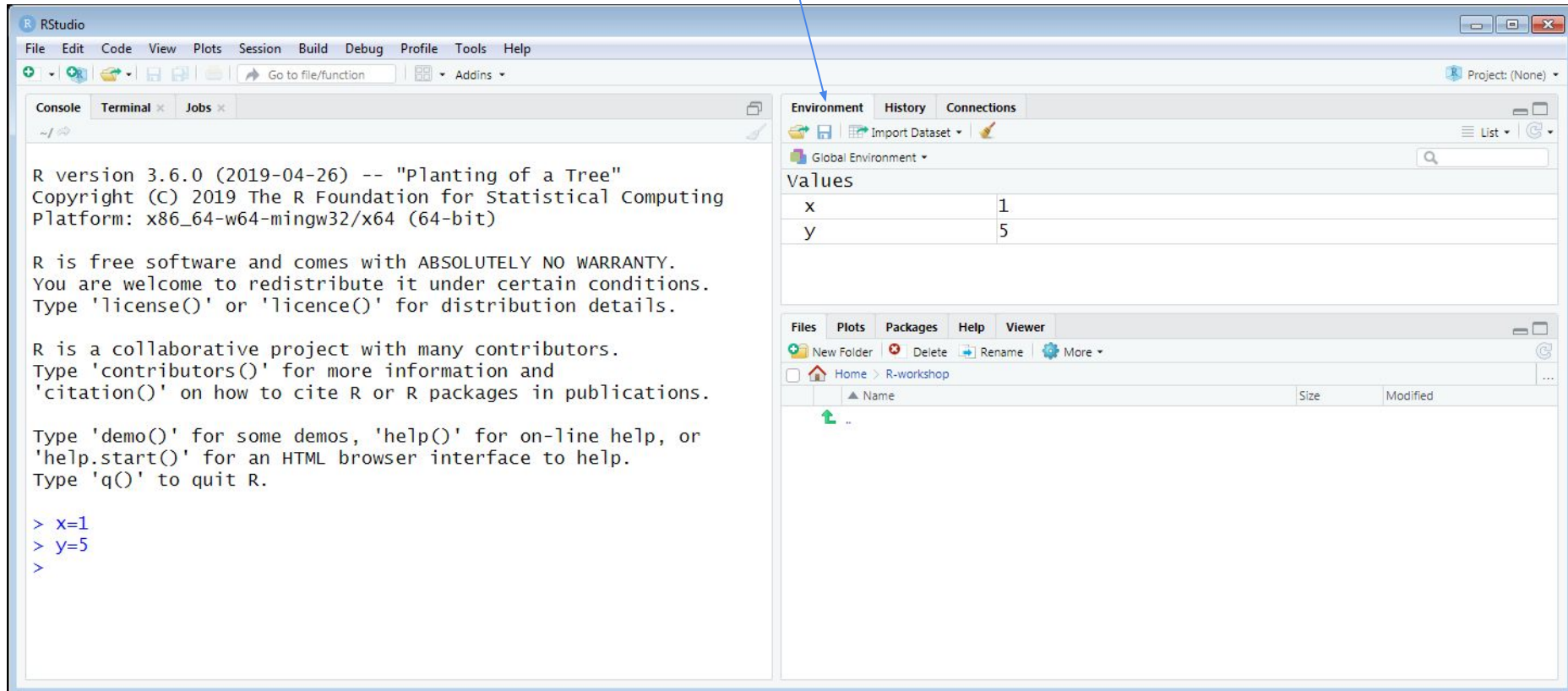
- In the Console type **x=1** and press **Enter**



RStudio

- In the Console type **x=1** and press **Enter**

Environment



The screenshot shows the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu bar is a toolbar with various icons. The main window is divided into four panes. The left pane is the Console, which displays the R version information (3.6.0, 2019-04-26) and the license text. The right pane is the Environment pane, which shows the Global Environment with two variables: x and y. The x variable has a value of 1, and the y variable has a value of 5. The bottom pane is the Files pane, which shows the current directory (Home > R-workshop) and a list of files.

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```
> x=1  
> y=5  
>
```

Environment

Global Environment

Values	
x	1
y	5

Files Plots Packages Help Viewer

New Folder Delete Rename More

Home > R-workshop

Name	Size	Modified
..		

RStudio

Environment

History

The screenshot displays the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and a search bar. The main workspace is divided into four panes: Console, Terminal, Jobs, and Environment/History/Connections. The Console pane on the left shows the R version (3.6.0), copyright information, and a series of commands and their outputs. The Environment pane on the right shows the Global Environment with variables x and y. The History pane shows the commands entered in the console. The Files pane at the bottom shows the current directory structure.

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```
> x=1  
> y=5  
>
```

Environment

Global Environment

Values	
x	1
y	5

History

Files

Plots

Packages

Help

Viewer

New Folder

Delete

Rename

More

Home > R-workshop

Name	Size	Modified
..		

RStudio

Environment

History

Plots

The screenshot shows the RStudio desktop environment. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and a search bar. The main workspace is divided into four panels: Console, Terminal, Jobs, and a right-hand sidebar. The Console panel on the left displays the R version (3.6.0), copyright information, and a series of commands and their outputs. The right-hand sidebar contains three tabs: Environment, History, and Connections. The Environment tab is active, showing a table of variables in the Global Environment. The History tab is also visible. The Plots panel is located at the bottom of the sidebar, showing a file explorer view of the current directory.

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'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

```
> x=1  
> y=5  
>
```

Values	
x	1
y	5

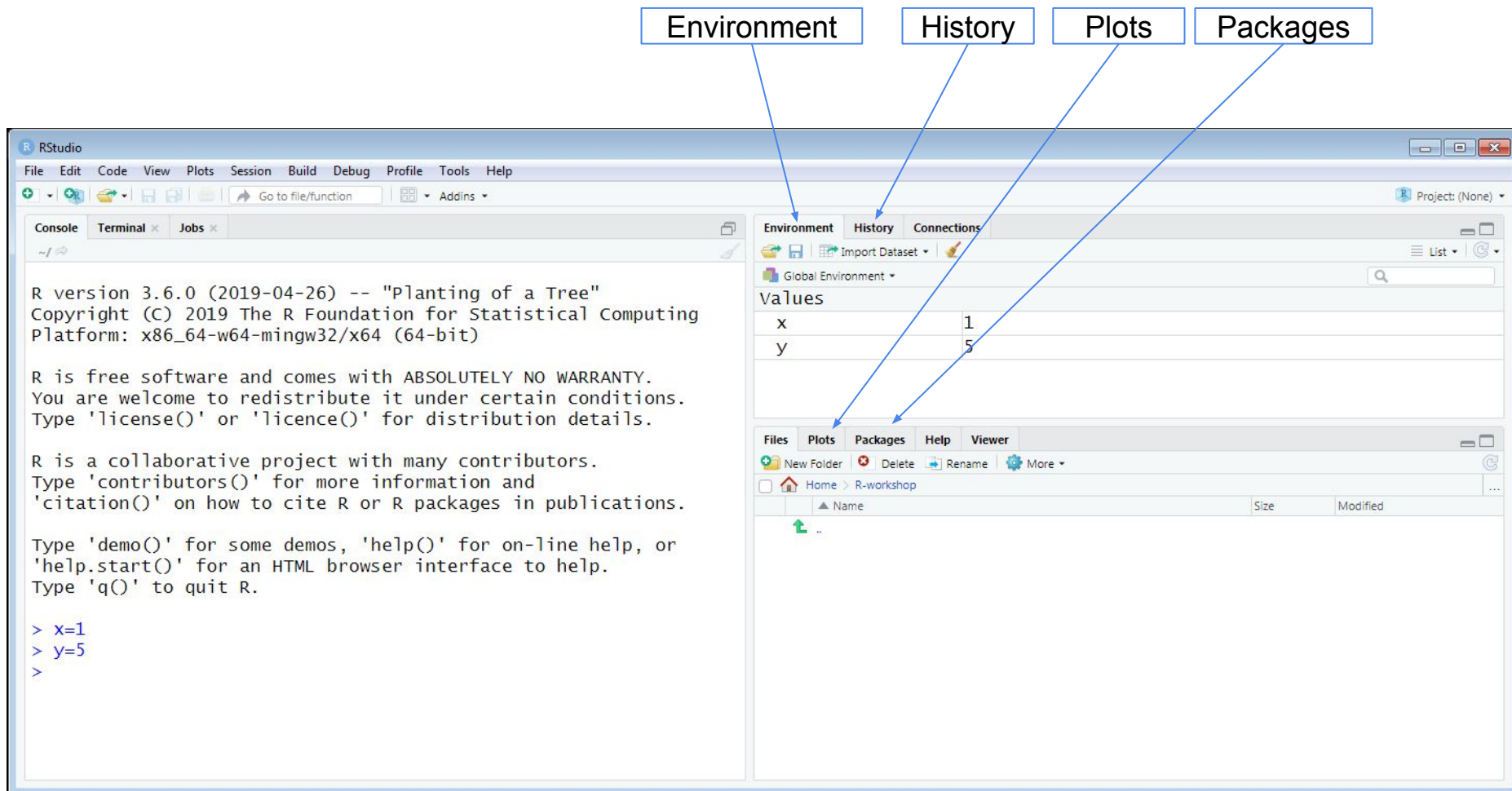
Files | Plots | Packages | Help | Viewer

New Folder | Delete | Rename | More

Home > R-workshop

Name	Size	Modified
..		

RStudio



RStudio

Environment

History

Plots

Packages

Help

The screenshot shows the RStudio desktop environment. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu bar is a toolbar with icons for file operations and a search bar. The main workspace is divided into several panes. On the left is the Console, which displays the R version (3.6.0), copyright information, and the results of the commands `x=1` and `y=5`. On the right is the Environment pane, which shows the Global Environment and the values of variables `x` (1) and `y` (5). Below the Environment pane is the History pane, which shows the command history. To the right of the History pane is the Plots pane, which is currently empty. Below the Plots pane is the Packages pane, which shows the installed and available packages. To the right of the Packages pane is the Help pane, which provides access to the R documentation. The bottom of the interface features a Files pane showing the current directory structure.

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```
> x=1  
> y=5  
>
```

Values	
x	1
y	5

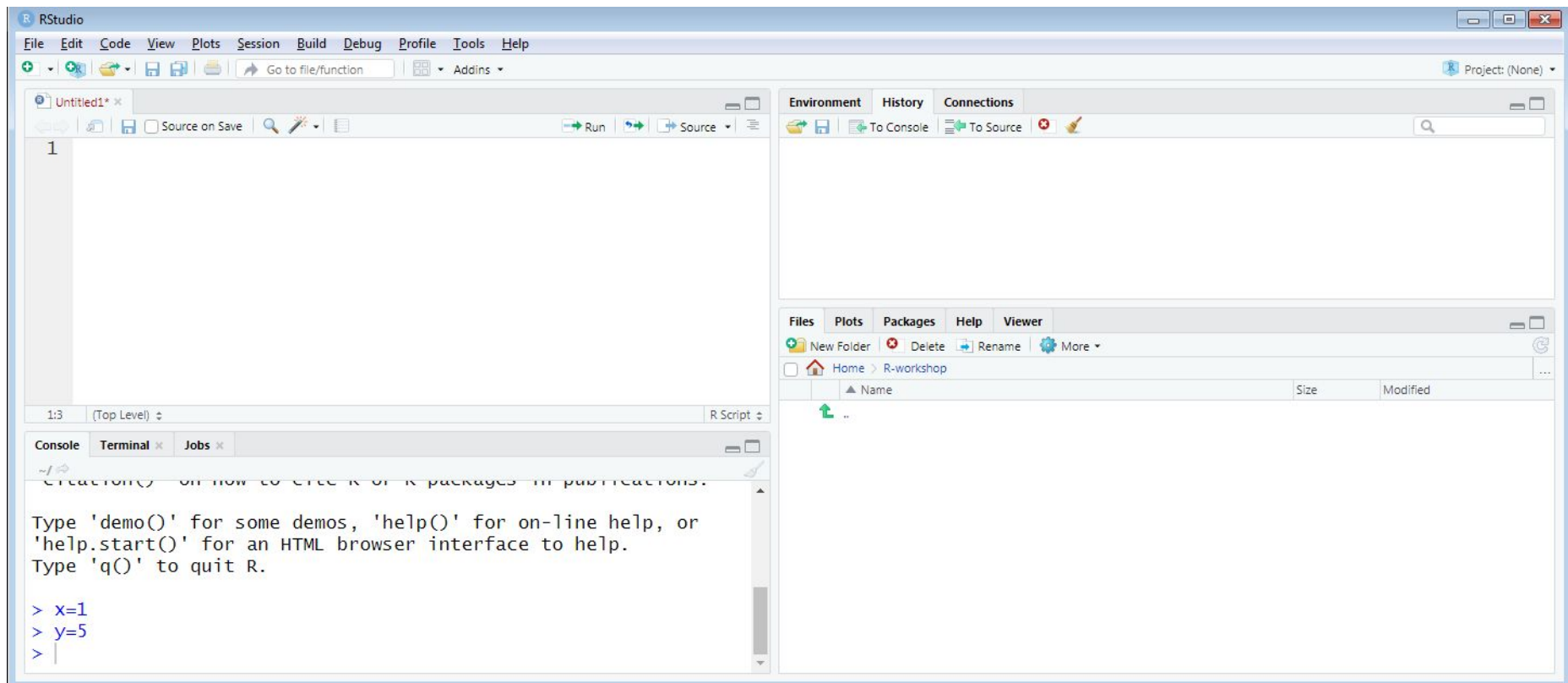
Files | Plots | Packages | Help | Viewer

Home > R-workshop

Name	Size	Modified
..		

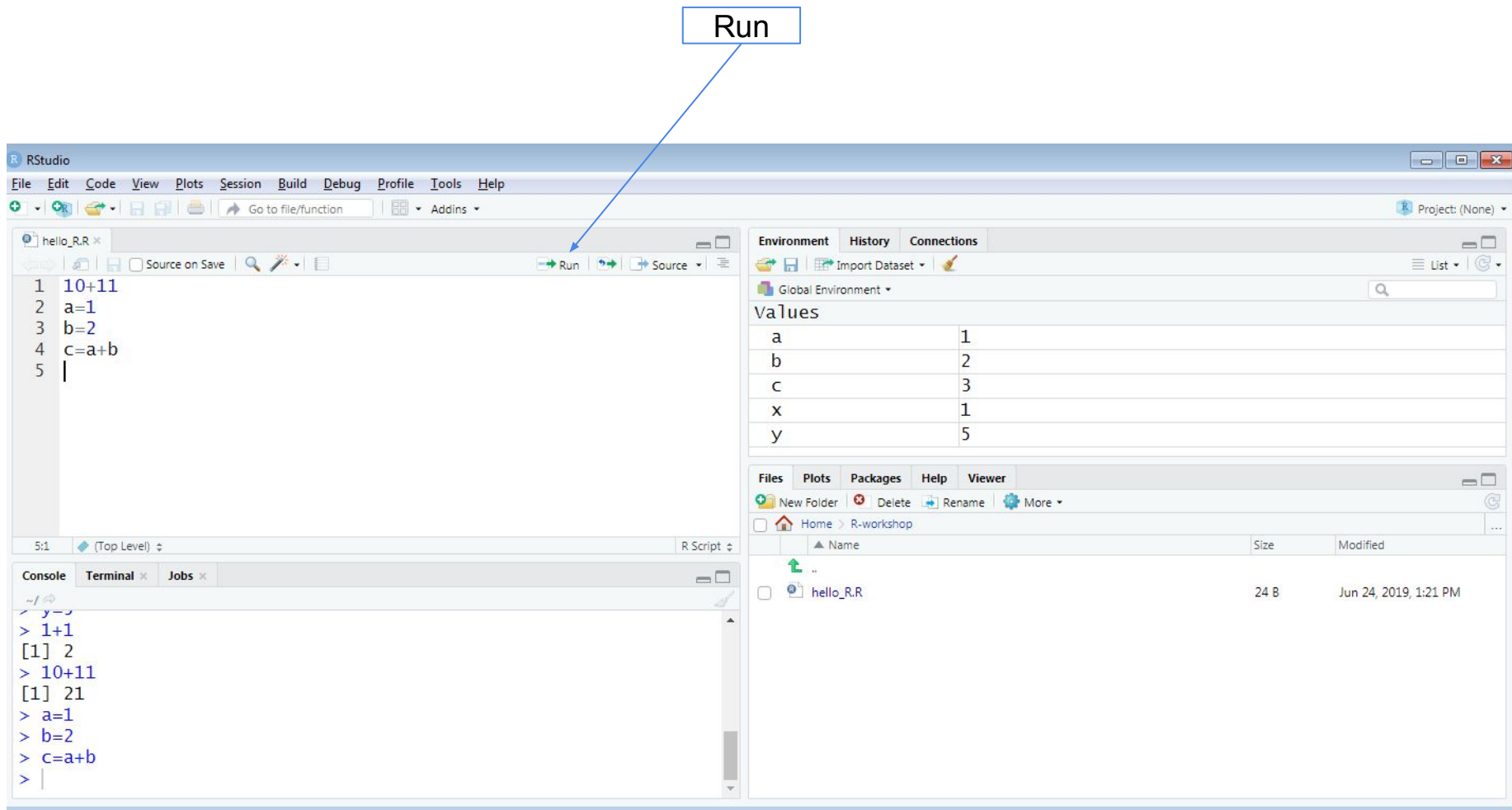
Create New File

- Go to File
- Click on “New File” > “R script”



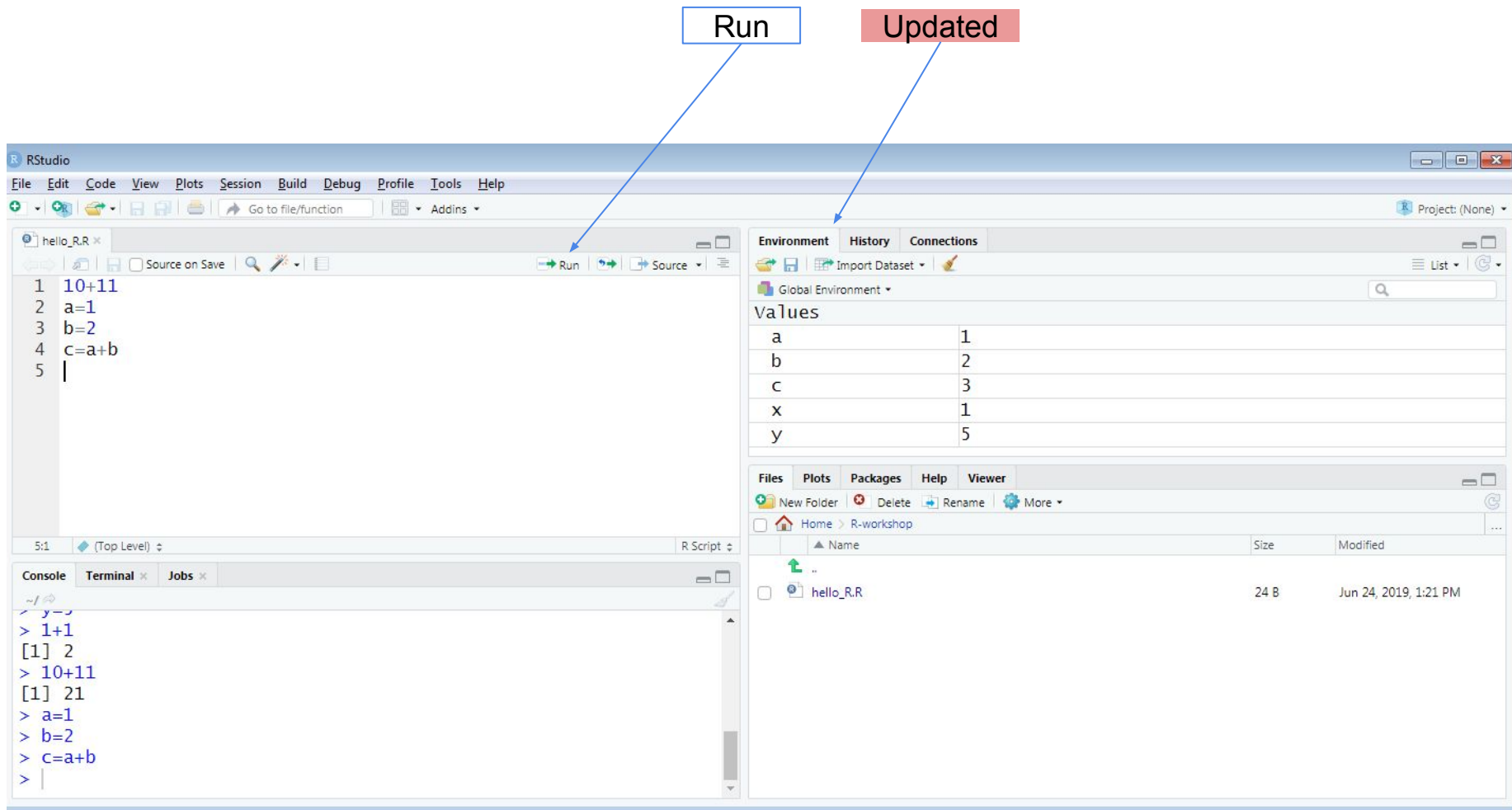
Run code

- Type few code
- Put mouse pointer on the line and click on “Run”



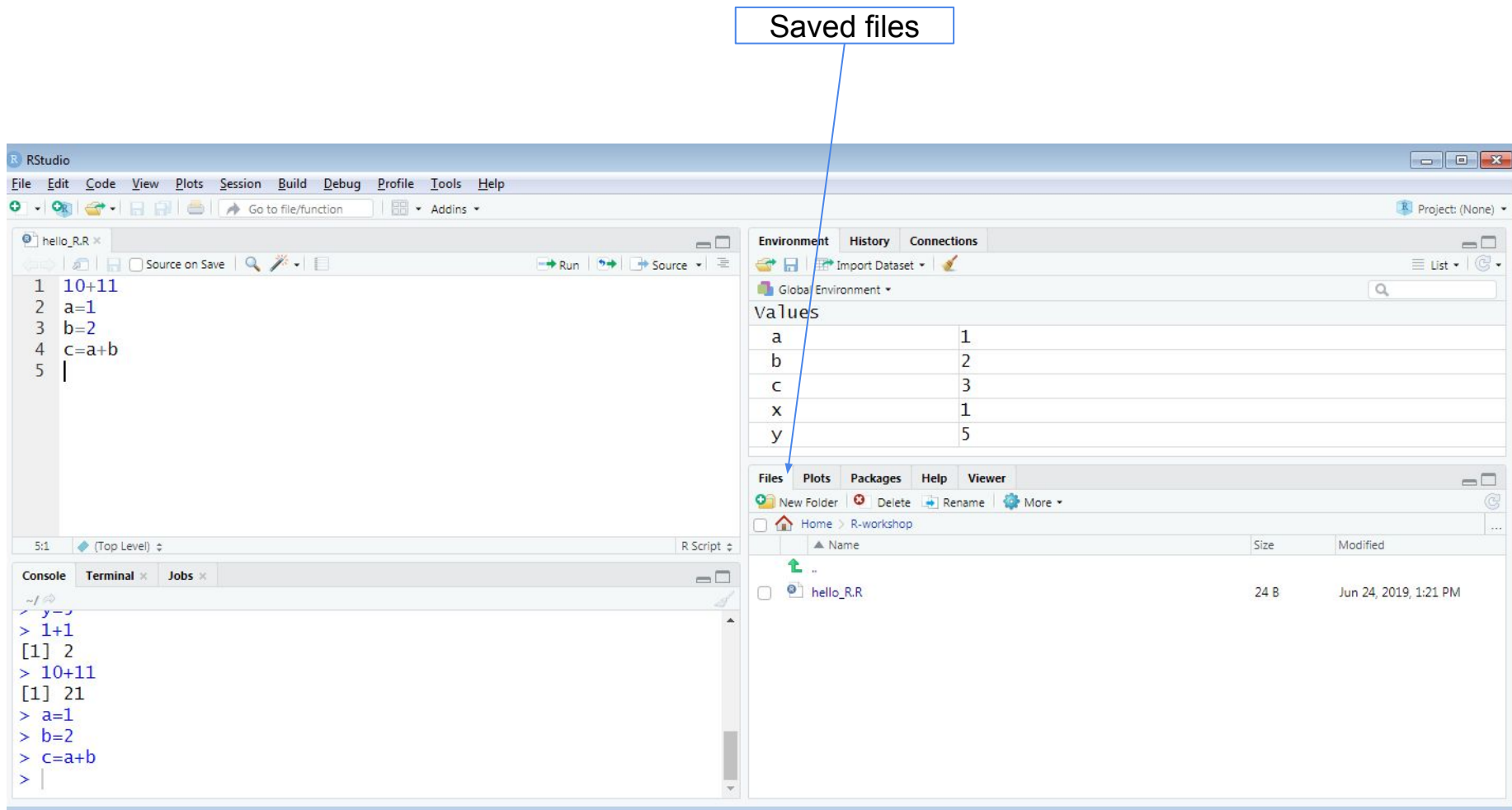
Run code

- Type few code
- Put mouse pointer on the line and click on “Run”



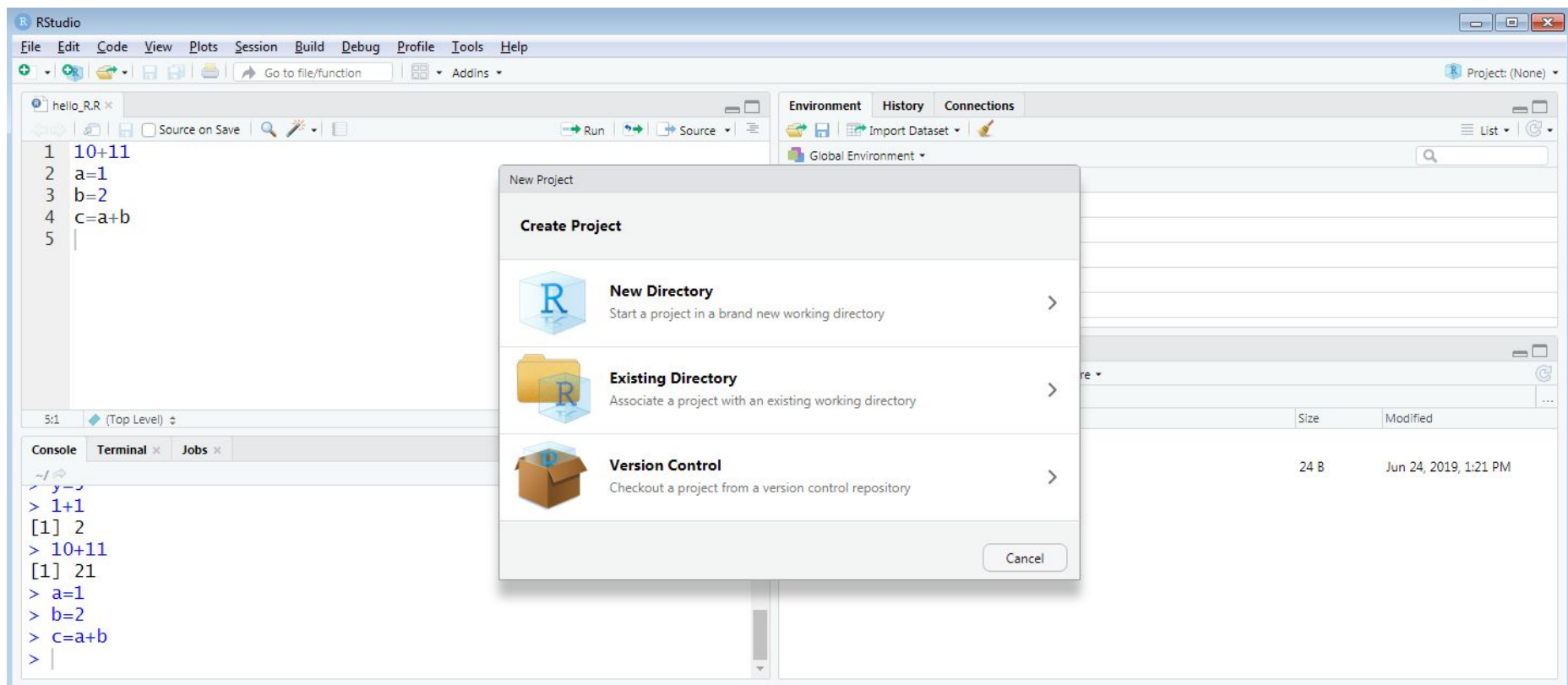
Save File

- Click on “File” and “save”



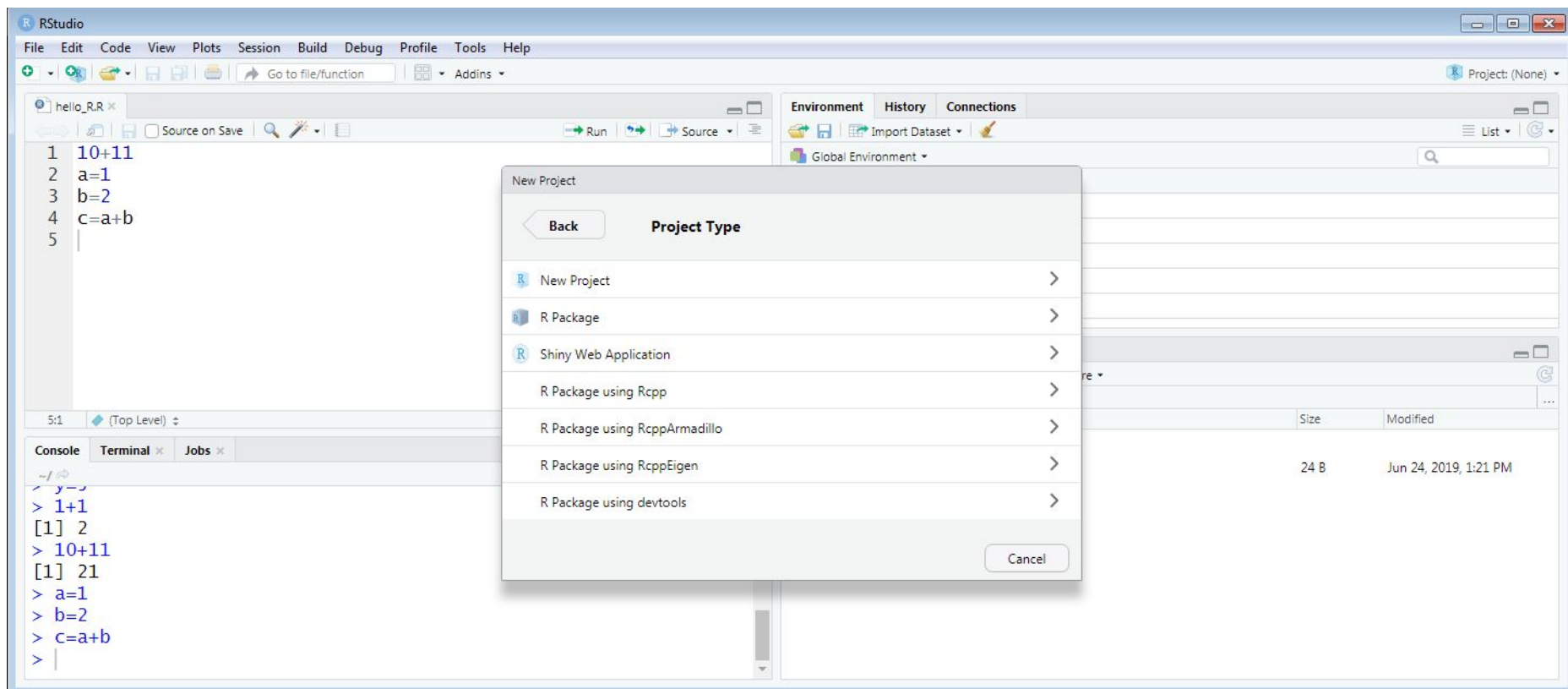
Create Project

- If you have several files related to one project it is a good idea to put all the files at one place
- History will also be saved
- To create a new project Click on:
 - File > New Project (it will ask to save old material, click on save)
 - Click on “New Directory”



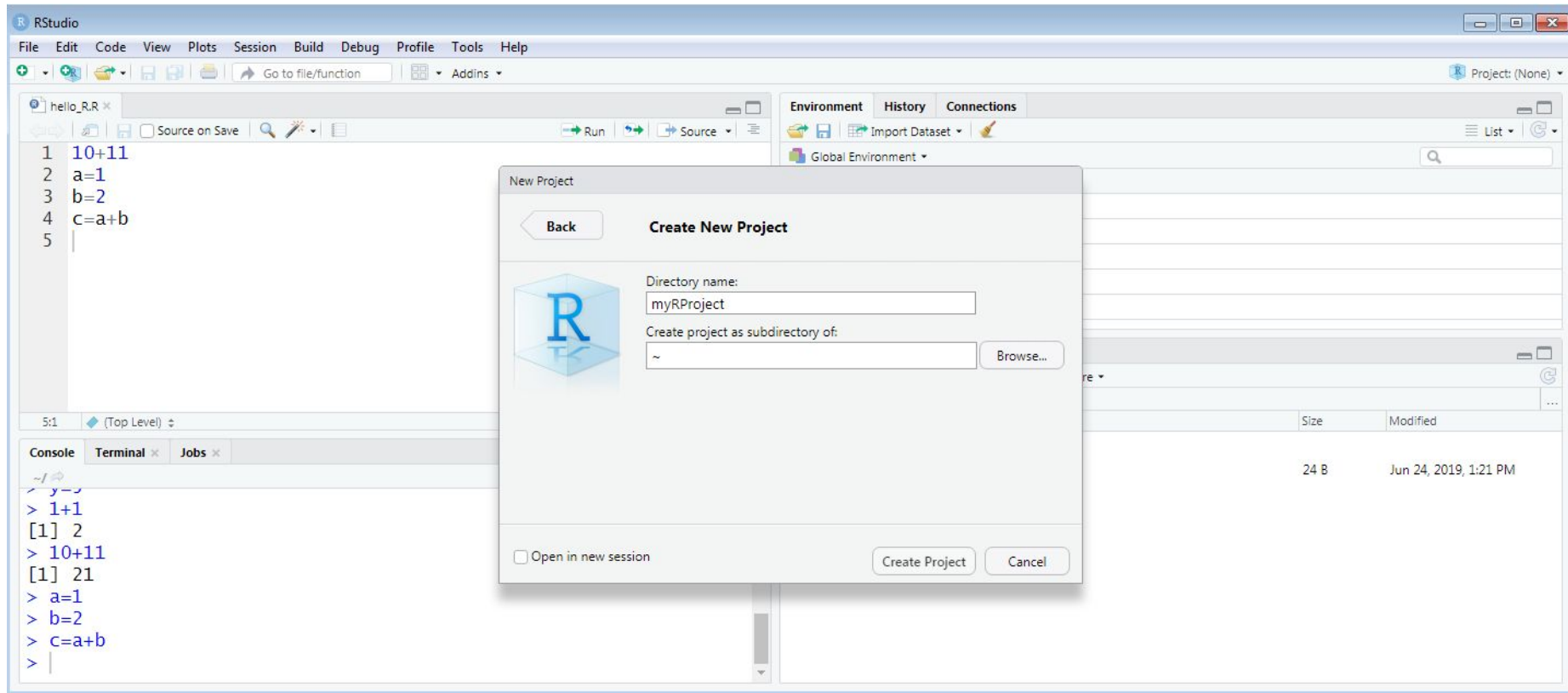
Create Project

- If you have several files related to one project it is a good idea to put all the files at one place
- History will also be saved
- To create a new project Click on:
 - File > New Project (it will ask to save old material, click on save)
 - Click on “New Directory” and then “New Project”



Create Project

- If you have several files related to one project it is a good idea to put all the files at one place
- History will also be saved
- To create a new project Click on:
 - File > New Project (it will ask to save old material, click on save)
 - Click on “New Directory” and then “New Project”
 - Give your project name “myRProject”
 - Click on “Create Project”



Create Project

- Now create a new file and save it as “hello_R”
- Notice the files in the “Files” tab.
- All R files are listed here
- If you close RStudio (or it crashes) you can open it again by going to “myRProject” folder and clicking on “myRProject.Rproj” file

