

# INTRODUCTION TO R

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# The language *R*

- ***R*** is a free statistical software that should be for data analysis part of this course.
- ***R*** can be downloaded from **CRAN**, which is a network of ftp and web servers around the world that store identical, up-to-date, versions of code and documentation for *R*.
- You can get to CRAN just by googling CRAN or <https://cran.r-project.org/>
- ***RStudio*** can be downloaded from: <https://www.rstudio.com/>
- To use the *RStudio*, one must download *R* first. Because The *RStudio* uses the *R* language to develop statistical programs.

# Download R

- Google CRAN or visit <https://cran.r-project.org/>
- Select your computer type.

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.

- Read the R FAQ before you start downloading.
- Download the newest version of R.

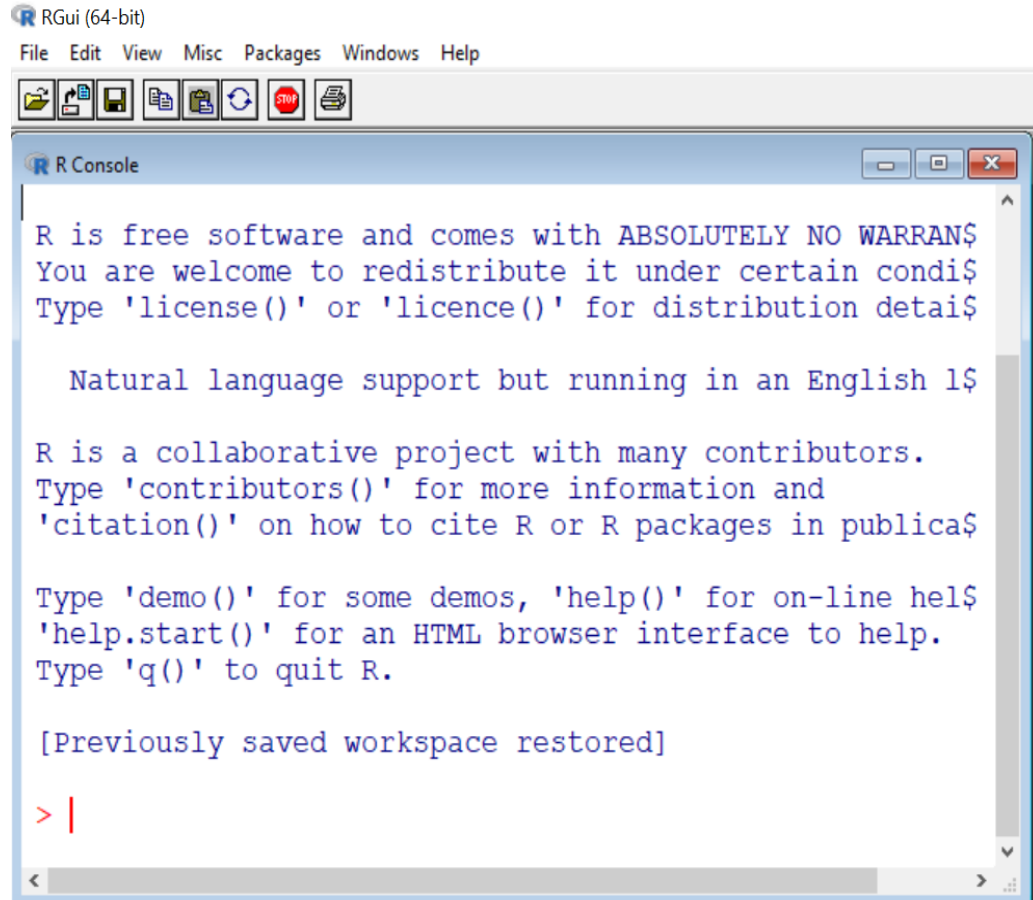
# Download *R*

- After *R* has been downloaded the desktop icon will look similar to



- Double click the icon to start an R session.
- For help with installing *R* contact JMU Information Technology Help Desk at (540) 568-3555 or [helpdesk@jmu.edu](mailto:helpdesk@jmu.edu)

# A New R Session



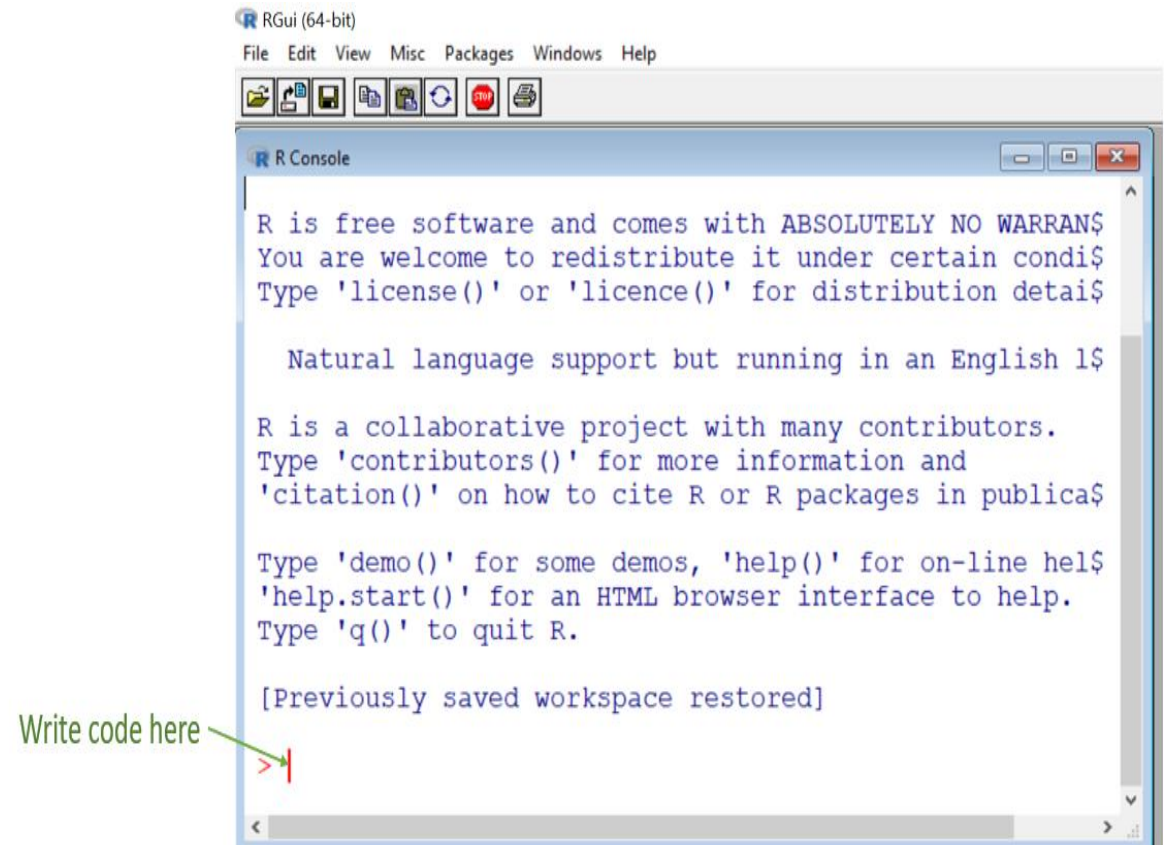
```
RGui (64-bit)
File Edit View Misc Packages Windows Help
R Console
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

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

[Previously saved workspace restored]
> |
```



```
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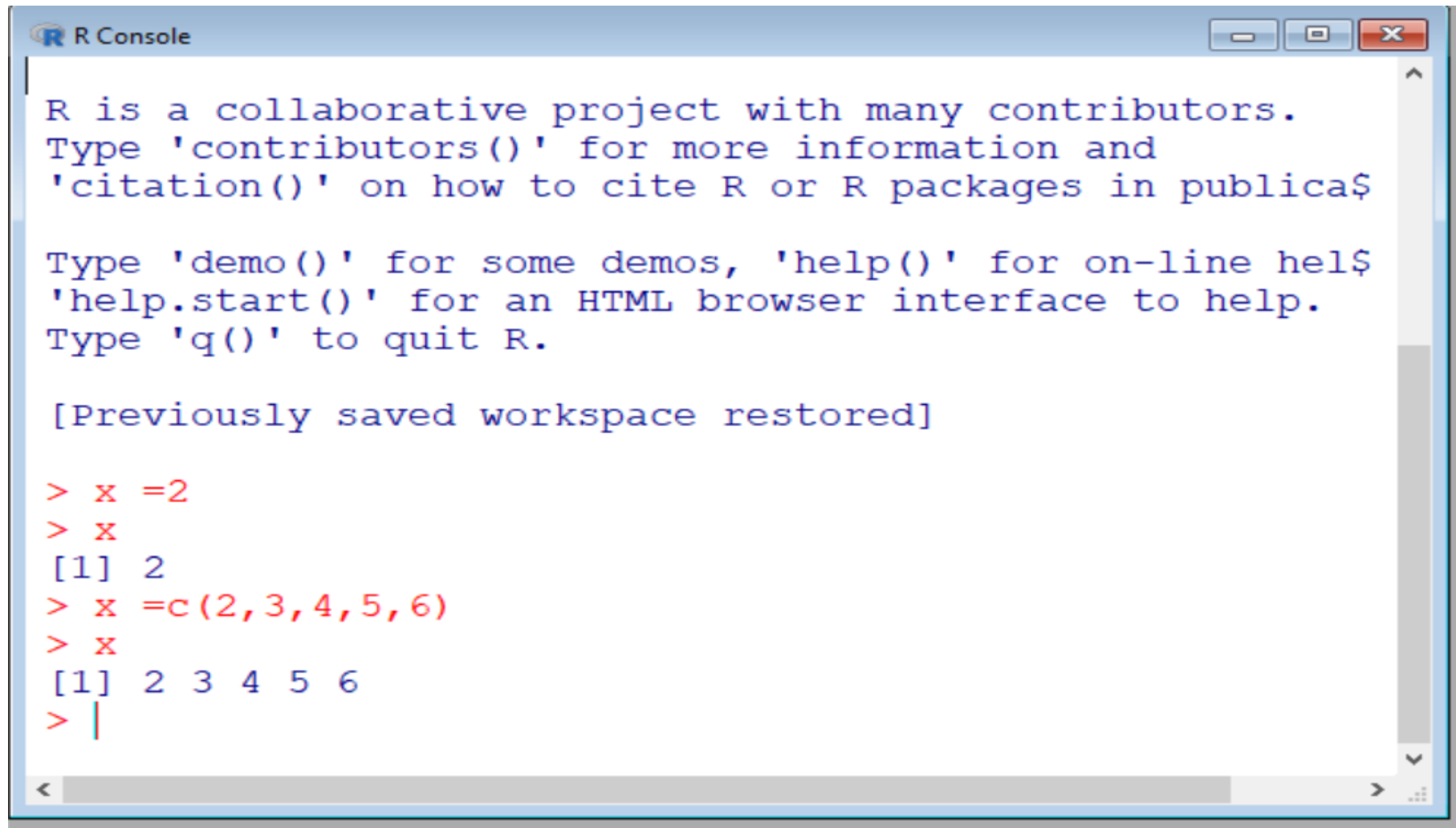
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[Previously saved workspace restored]
> |
```

Write code here

# Writing code on the command prompt



```
R Console

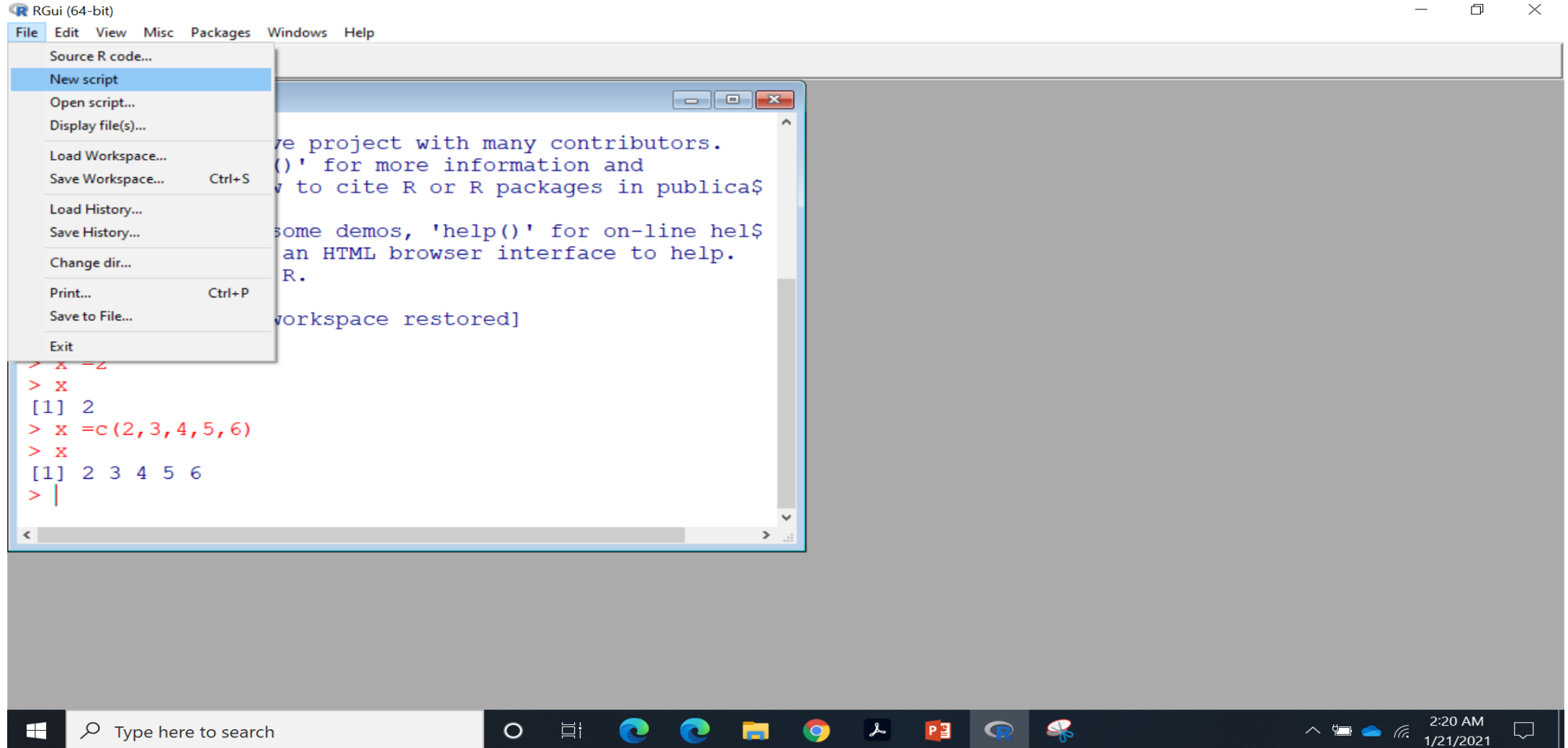
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[Previously saved workspace restored]

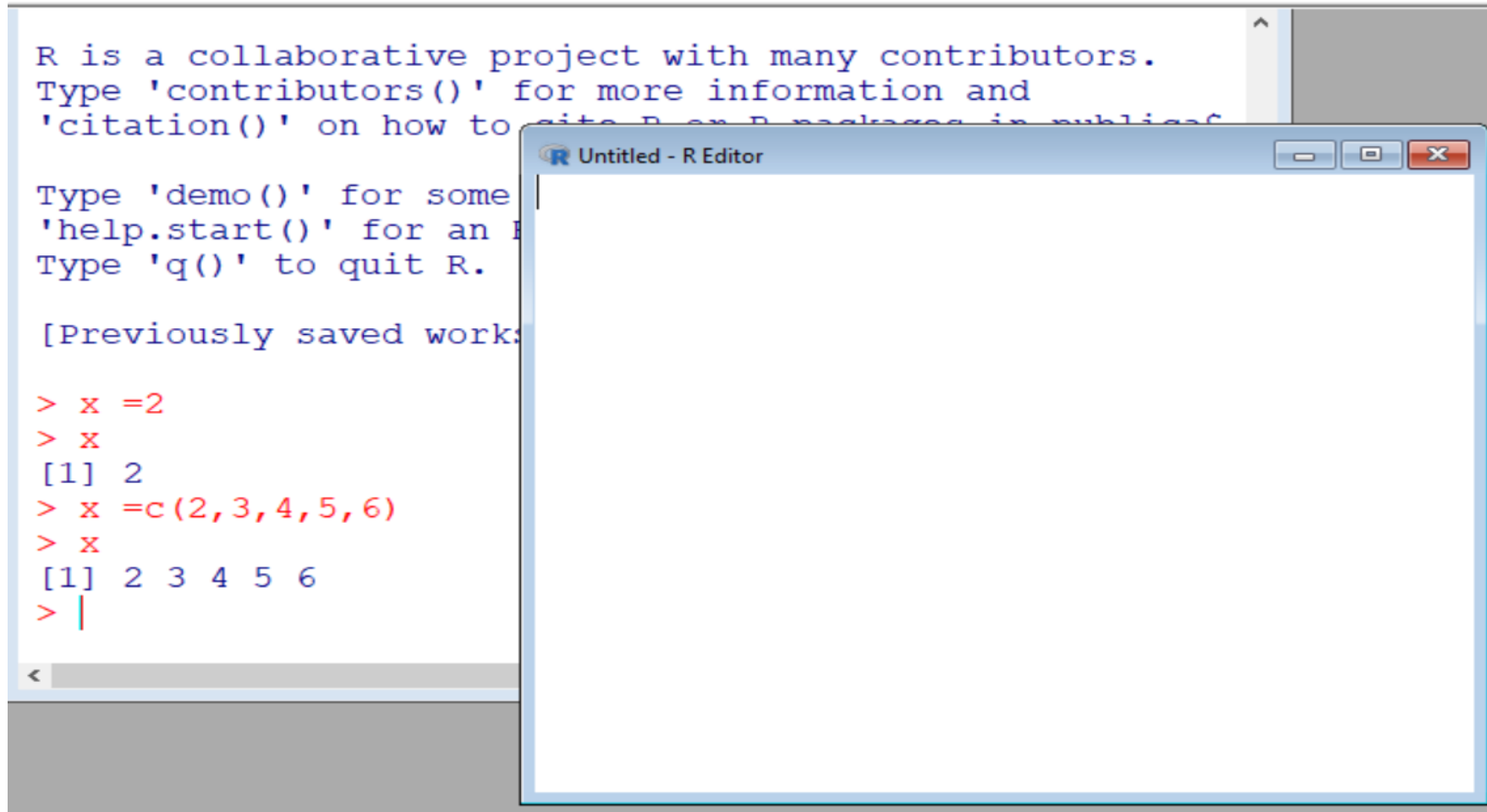
> x =2
> x
[1] 2
> x =c(2,3,4,5,6)
> x
[1] 2 3 4 5 6
> |
```

# Open a script file to write code



# Writing code on a script file

- New screen is a blank file, untitled R editor where we can write our code.





# Writing code on a script file

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

[Previously saved workspace]

```
> x = 2
> x
[1] 2
> x = c(2, 3, 4, 5, 6)
> x
[1] 2 3 4 5 6
> |
```

Untitled - R Editor

```
#####
### Basic R codes ###
### File name:basic1.R ###
#####
x=c(2,3,4,5,6) # column vector
mean(x)        # mean of x
sd(x)          # standard deviation of x
```

# Difference between *R* & *RStudio*

- *R* is a programming language used for statistical computing while *RStudio* uses the *R* language to develop statistical programs.
- In *R*, a program can be written and run the code independently of any other computer program.
- *RStudio* however, must be used alongside *R* in order to properly function. This is an IDE (integrated development environment).
- *RStudio* allows users to develop and edit programs in *R* by supporting a large number of statistical packages.
- *RStudio* usually provided higher quality graphics, and better ability to manage workspaces. **Need to download R first, then R Studio!**

# R Studio Session

- A new **R** Studio session will open up with a screen like this:

The screenshot displays the RStudio environment. The main window is titled 'Untitled1' and contains a single line of code: '1'. A blue arrow labeled 'Script window' points to this area. Below the script window is the 'Console' window, which shows the R prompt and the following text: '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. [Workspace loaded from ~/.RData]'. A blue arrow labeled 'Command prompt' points to the prompt '> |'. The right-hand side of the interface features several panels: 'Environment' (showing 'Global Environment' and 'Environment is empty'), 'Files' (showing a file explorer view of the home directory), and 'Plots', 'Packages', 'Help', and 'Viewer' panels.

Script window

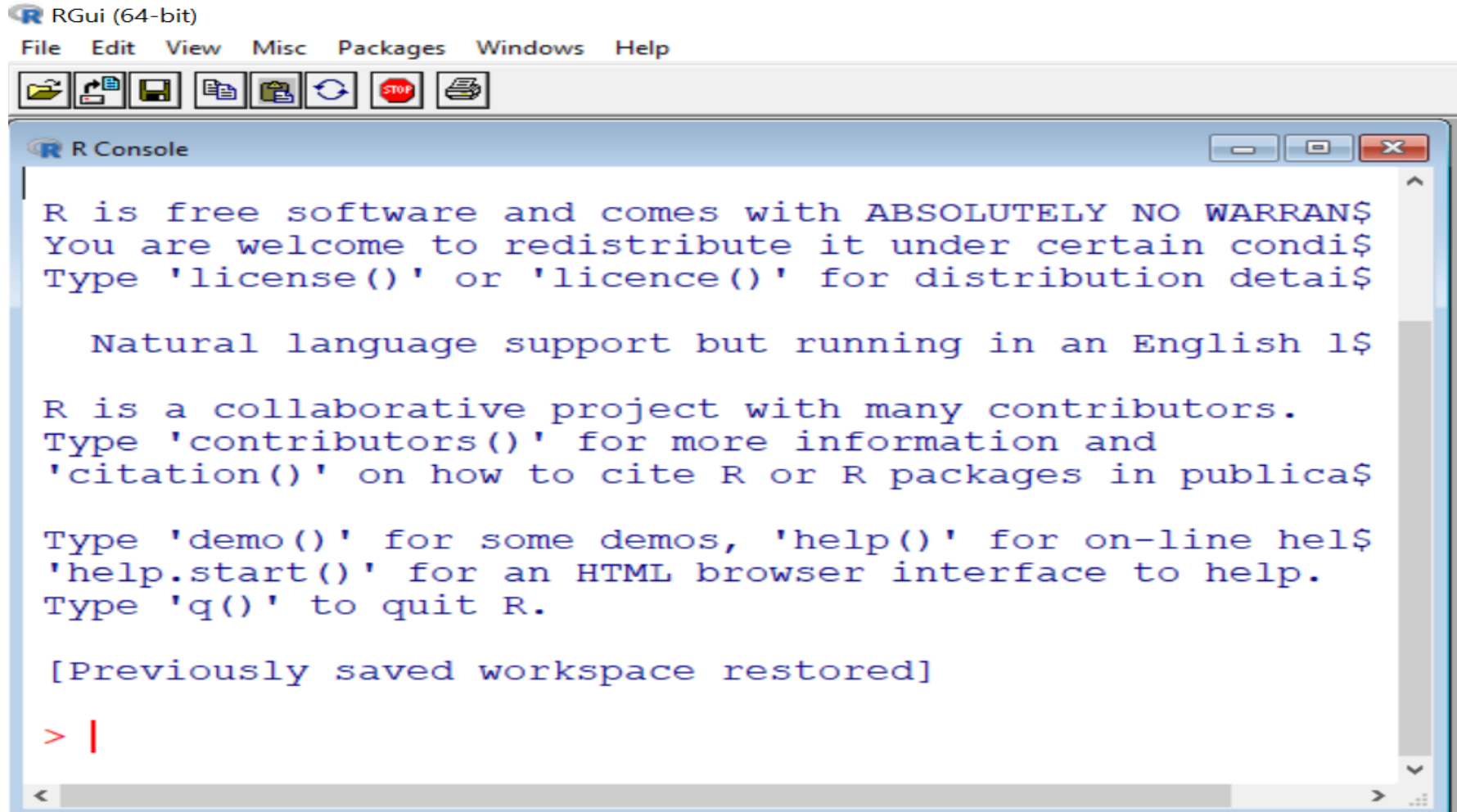
Command prompt

# R script file

- The codes form an *R* script file can be **executed or “run”** by **highlighting the code** (all of it or some part it) **and then press Ctrl R**.
- The *R* script file can be saved on a folder (either on the computer or a flash drive) for later use.
- To save a new *R* script file, go to ‘File’ on the menu bar and select ‘save as’ option. Then choose the folder and also assign a name to the file.
- To open an existing (saved) *R* script file, go to ‘File’ and select ‘Open’ option. Then find the folder and locate the file.
- To end an *R* session type **“q()”** on the command prompt of the R console.

# R Session

- A new *R* session will open up with a screen like this:



```
RGui (64-bit)
File Edit View Misc Packages Windows Help
[Icons: File Explorer, Print, Save, Copy, Paste, Refresh, Stop, Print]

R Console
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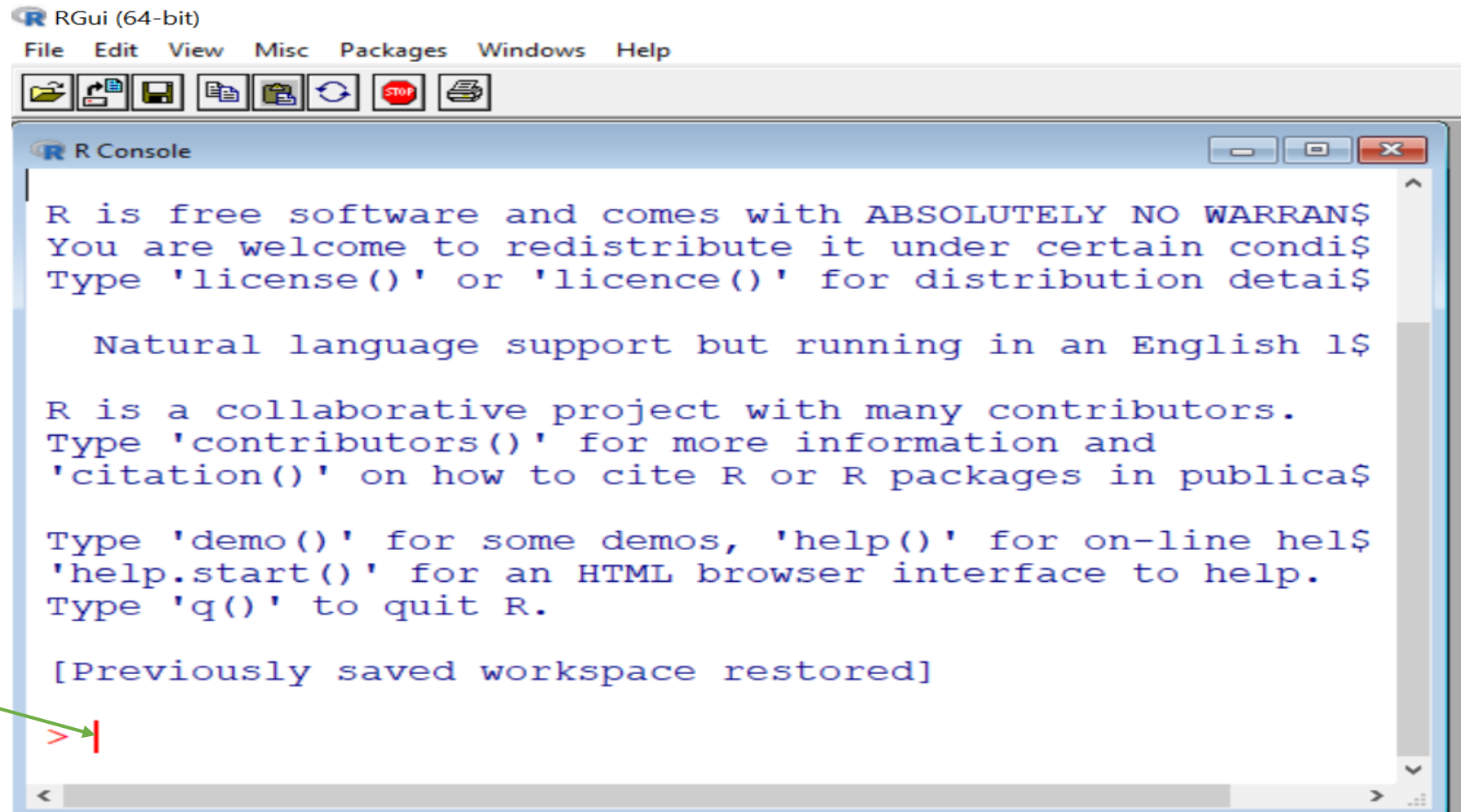
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```

# Writing code on the command prompt



Write code here