R for data analysis

Clinical Research Support Unit

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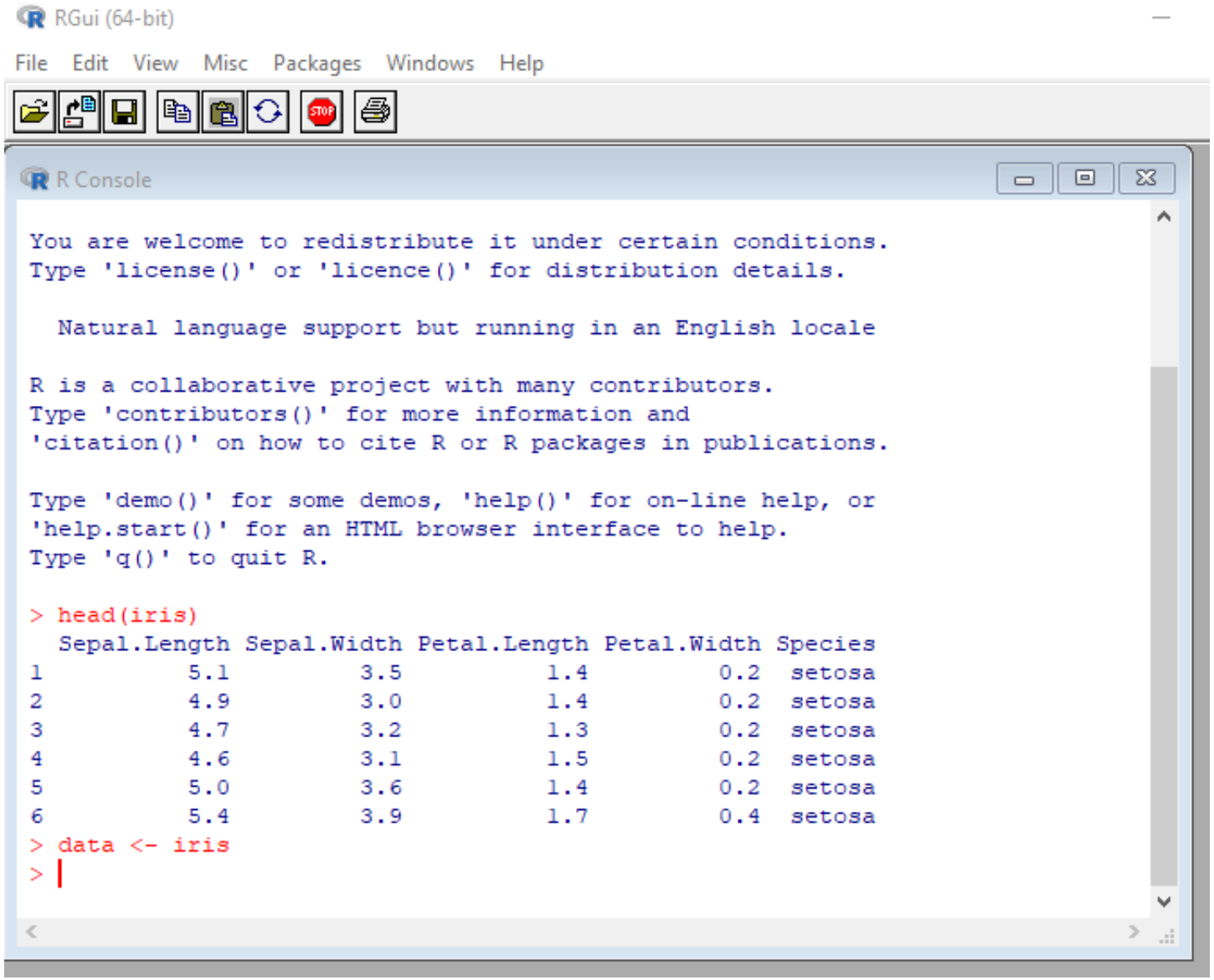
R interface – R GUIs (Graphical User Interfaces)



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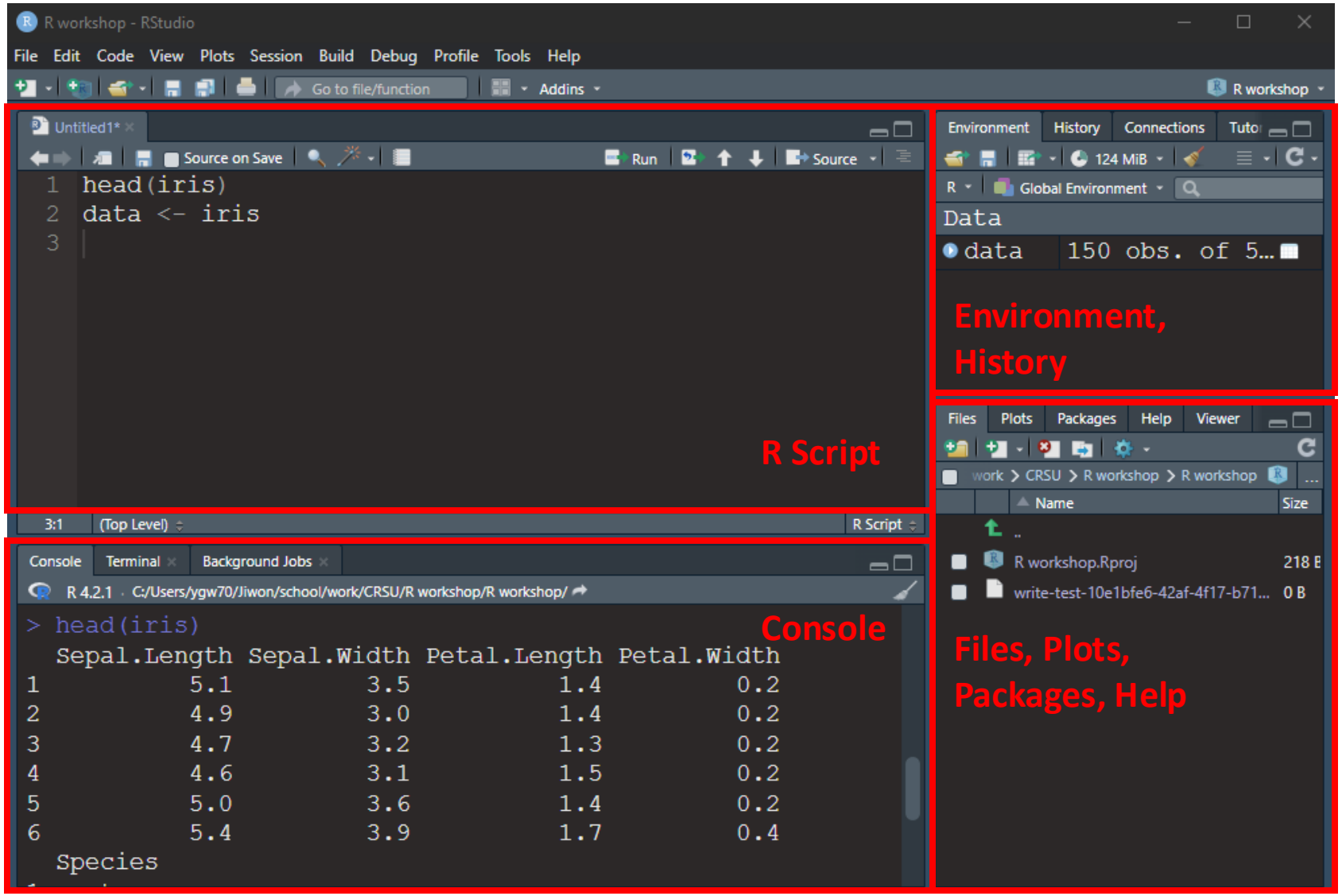
R interface – RStudio



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Installation

Google

r software

1. Search R

Images | Download | Tutorial | Course | Videos | Books | Online | Engineering | Suite

About 12,320,000,000 results (0.56 seconds)

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The R Project for Statistical Computing
https://www.r-project.org

The R Project for Statistical Computing

R is a free **software** environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

Results from r-project.org

An Introduction to R

This manual provides information on data types, programming ...

R-4.3.1 for Windows

This build requires UCRT, which is part of Windows since Windows

About R

R is a language and environment fo

2. Click Windows or macOS depending on your OS

R for macOS

Tools - Index of /bin/macosx/base - FAQs - ...

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Installation

R-4.3.1 for Windows

2. Click download

Download R-4.3.1 for Windows (79 megabytes, 64 bit)

README on the Windows binary distribution

New features in this version

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r studio download

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Posit
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RStudio Desktop

Used by millions of people weekly, the **RStudio** integrated development environment (IDE) is a set of tools built to help you be more productive with **R** and ...

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3. Click download RStudio

The most popular coding environment for **R**, built with love by Posit. Used by millions of people weekly, the **RStudio** integrated development environment (IDE) is ...

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Installation

DOWNLOAD

RStudio IDE

The most popular coding environment for R, built with love by Posit.

Used by millions of people weekly, the RStudio integrated development environment (IDE) is a set of tools built to help you be more productive with R and Python. It includes a console, syntax-highlighting editor that supports direct code execution. It also features tools for plotting, viewing history, debugging and managing your workspace.

If you're a professional data scientist and want guidance on adopting open-source tools at your organization, don't hesitate to book a call with us.

4. Click download RStudio

DOWNLOAD RSTUDIO | DOWNLOAD RSTUDIO SERVER

RStudio Desktop

Used by millions of people weekly, the RStudio integrated development environment (IDE) is a set of tools built to help you be more productive with R and Python.

If you're a professional data scientist looking to download RStudio and also need common enterprise features, don't hesitate to book a call with us.

1: Install R

RStudio requires R 3.3.0+. Choose a version of R that matches your computer's operating system.

DOWNLOAD AND INSTALL R

2: Install RStudio

DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS

5. Click download RStudio

Size: 212.77 MB | SHA-256: A8325AD5 | Version: 2023.06.1+524 | Released: 2023-07-07

R works via USER made packages

- R works via USER make packages
  - There are 20066 packages
  - https://cran.r-project.org/web/packages/available_packages_by_name.html
  - Submission and general verification is done by volunteers with CRAN
  - Fundamentally different than Stata and SAS

- Two general frameworks for working with data
  - Base R
  - Tidyverse (Developed by RStudio)
  - If you google around know which one you are looking for

Good coding practices

- Good idea to follow
  - https://google.github.io/styleguide/Rguide.html
  - https://www.r-bloggers.com/2018/09/r-code-best-practices/
    - There are 5 naming conventions to choose from:
      - *alllowercase*: e.g. adjustcolor
      - *period.separated*: e.g. plot.new
      - *underscore_separated*: e.g. numeric_version
      - *lowerCamelCase*: e.g. addTaskCallback
      - *UpperCamelCase*: e.g. SignatureMethod
    - Pick one naming convention and stick to it. My suggestion:
      - **Files**: underscore_separated, all lower case: e.g. numeric_version
      - **Functions**: *UpperCamelCase*, all lower case: e.g. MyFunction
      - **Variables**: underscore_separated, all lower case: e.g. numeric_version

Entering data (vector)

```
# if we put # sign, R will not recognize it
# entering numeric data/value 1 into environment (named as a)

a <- 1
# to see data
a

# entering hello world into environment (named as b)
# hello is character data, use single or double quote
b <- "hello world"
b

# Given names such a, b are not case sensitive
```

Entering data (vector)

entering multiple **numeric** data into environment (named as **a_1**)

```
a_1 <- c(22, 55, 26, 30, 42, 24)
a_1
```

capital C will not work

no space or unequal space between values will work

entering multiple **character** data into environment (named as **b_1**)

```
b_1 <- c("m", "f", "m", "m", "f", "m")
b_1
```

Entering data, Creating dataset

```
c.1 <- c(1, 2, 3, 4, 5, 6)
c.1

# creating data set named 'practice' using variable a_1, b_1, c_1
practice <- data.frame(age=a_1, sex=b_1, id=c_1)

# length of a_1, b_1, c_1 should be same
# giving name as 'age' using a_1
# giving name as 'sex' using b_1
# giving name as 'id' using c_1

# data.frame is a function and should be typed as it is
```

Exploring dataset

to know about the data

str(practice)

to get summary statistics

summary(practice)

to get summary statistics only for age

summary(practice$age)

Exploring dataset

to see frequency distribution of variables
we need to install a package called ‘dplyr’

install.packages(‘dplyr')
library(dplyr)

to see frequency distribution of age
dplyr::count(practice, age)

to see frequency distribution of sex
dplyr::count(practice, sex)

Exploring dataset

#to see summary data

install.packages("vtable")
library(vtable)

st(practice)

#individual function can be used to get certain descriptives

sd(practice$age)

#sd is a function

Saving data set

```
# Export/save data 'practice' in csv format

# Where is the data going to go?

getwd()
setwd()

write.csv(practice, file = "location/practice.csv")
```

Importing data named ‘test’

```
test <- read.csv(“location of the data/test.csv", header = TRUE)

head(test,10)

tail(test,10)

# To know about data
str(test)
summary(test)
```

Creating sub data set

```
# keep selected variables age, gender, id in a new data set named ‘newdata’
newdata <- dplyr::select(test, age, gender, id)
str(newdata)

# creating sub data set named ‘newdata1’ with female only

newdata_female <- dplyr:: filter(test, gender == "f")
str(newdata_female)
```

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Data visualization

```
# to see histogram
hist_age <- hist(test$age)
plot(hist_age)

#visualize your data using scatter plots
install.packages("ggplot2")
library(ggplot2)

## histogram for age
hist_age_ggplot <- ggplot(test, aes(age)) +
                geom_histogram()
plot(hist_age_ggplot)
```

Data visualization

```
## scatter plot ldl1 and ldl2
# ldl1 and ldl2 are continuous variables

scatter_ldl <- ggplot(test, aes(x = ldl1, y = ldl2)) +
                geom_point()
plot(scatter_ldl)

## scatter plot ldl1 and ldl2 with a regression line

scatter_ldl_lm <- ggplot(test, aes(x = ldl1, y = ldl2)) +
  geom_point() +
  geom_smooth(method = "lm")
plot(scatter_ldl_lm )
```

Data visualization

```
## save your image

ggsave(scatter_lm.pdf, plot = scatter_ldl_lm, dpi = 300)
```

Survey! Day 3

What are some aspects of R that you would like to learn on Day 3?

- *Data Visualization (Part 2)*
- *Census Data Analysis*
- *Advanced Data Wrangling*
- *Maps and Spatial Data*
- *Multilevel Modelling*
- *Machine Learning 100*

Acknowledgment
Jiwon Yoon
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