STATISTICAL COMPUTATION

WEEK 1 - INTRODUCTION

Annisa Auliya
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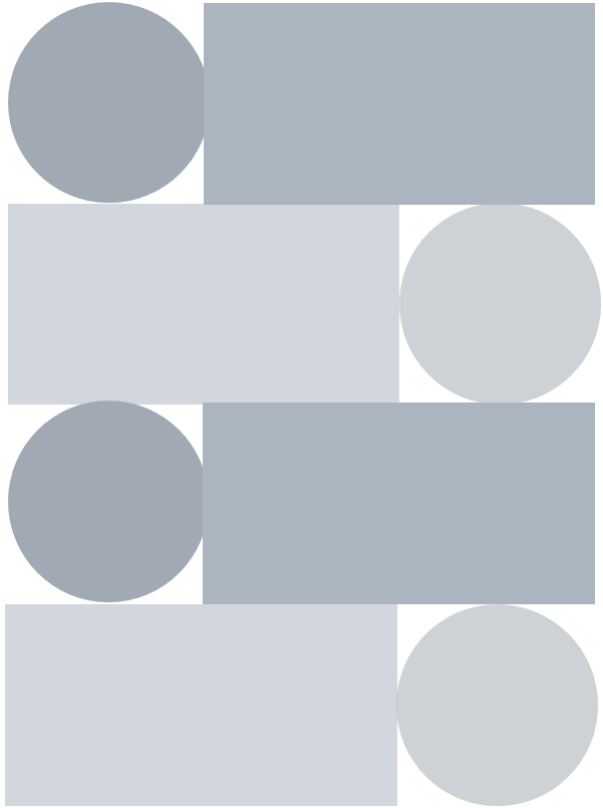

GET TO KNOW US

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https://intip.in/KomstatC2023

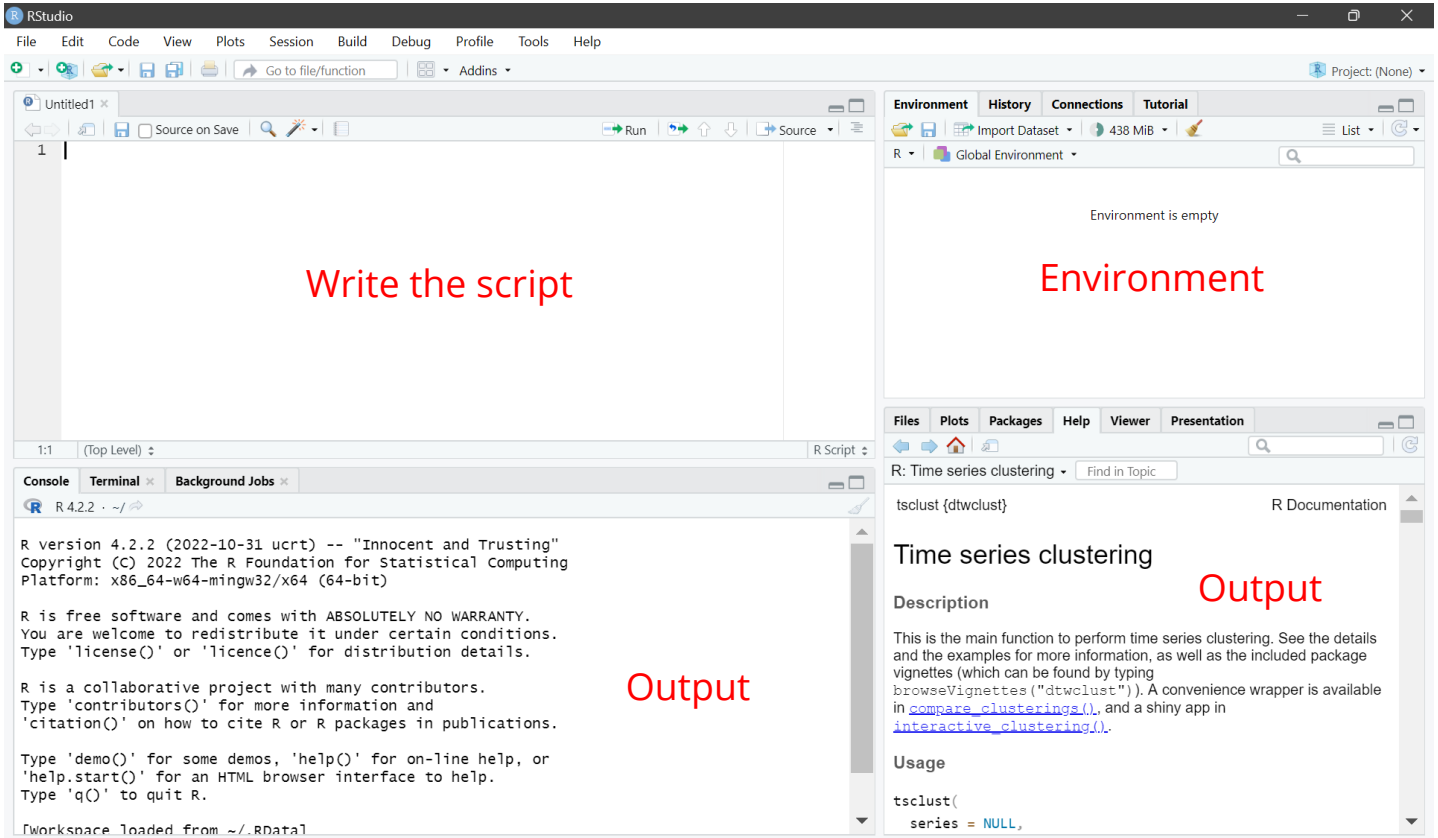
MATERIALS

- Introduction
- Package
- Import/Export
- Load data
- Mathematical operation

01

INTRODUCTION

INTERFACE


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
Untitled1
Source on Save
Run
Source
Write the script
Environment History Connections Tutorial
Import Dataset
438 MiB
List
Global Environment
Environment is empty
Environment
Files Plots Packages Help Viewer Presentation
R: Time series clustering
Find in Topic
tsclust {dtwclust}
R Documentation
Time series clustering
Output
Description
This is the main function to perform time series clustering. See the details and the examples for more information, as well as the included package vignettes (which can be found by typing browseVignettes("dtwclust")). A convenience wrapper is available in compare_clusterings(), and a shiny app in interactive_clustering().
Usage
tsclust(
series = NULL,
Console Terminal Background Jobs
R 4.2.2 · ~/
R version 4.2.2 (2022-10-31 ucrt) -- "Innocent and Trusting"
Copyright (C) 2022 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.
[Workspace loaded from ~/.RData]
Output

02

PACKAGE

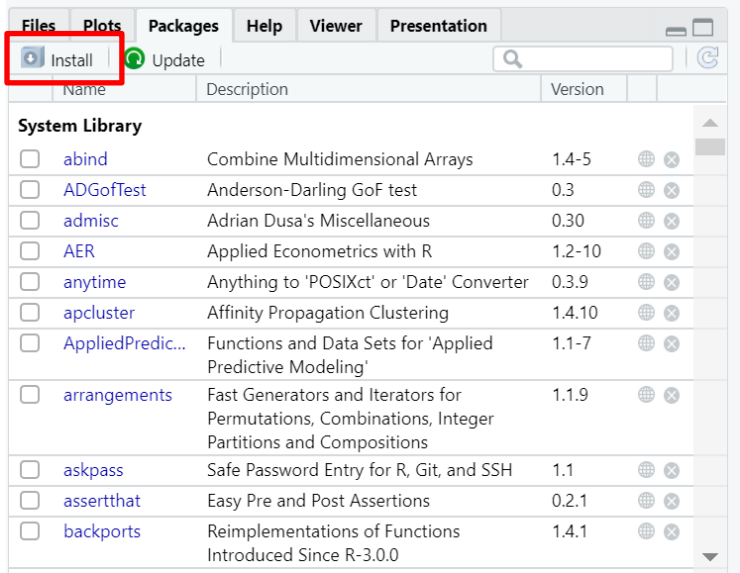
Install, Load, Help

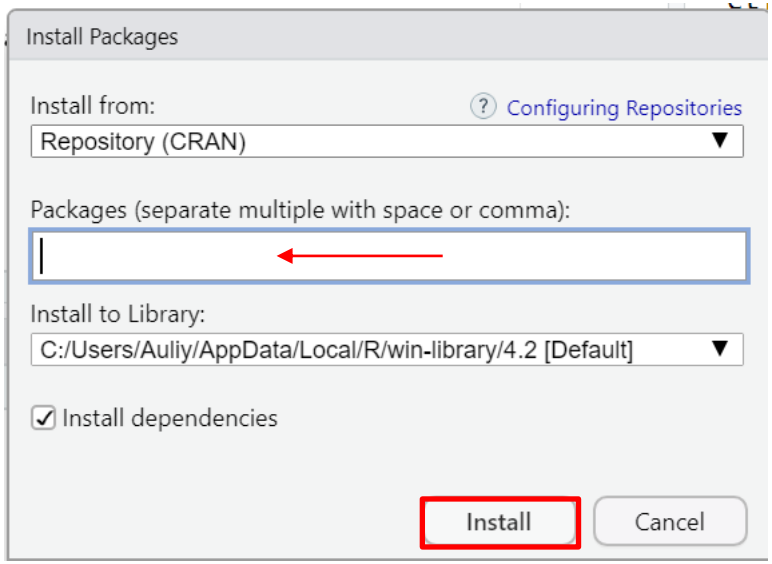
PACKAGE

- Install
  > install.packages("car")
- Load
  > library(car)
- Help
  > help(avPlots, package="car")
  > ??avPlots
  > browseVignettes(package="car")

PACKAGE

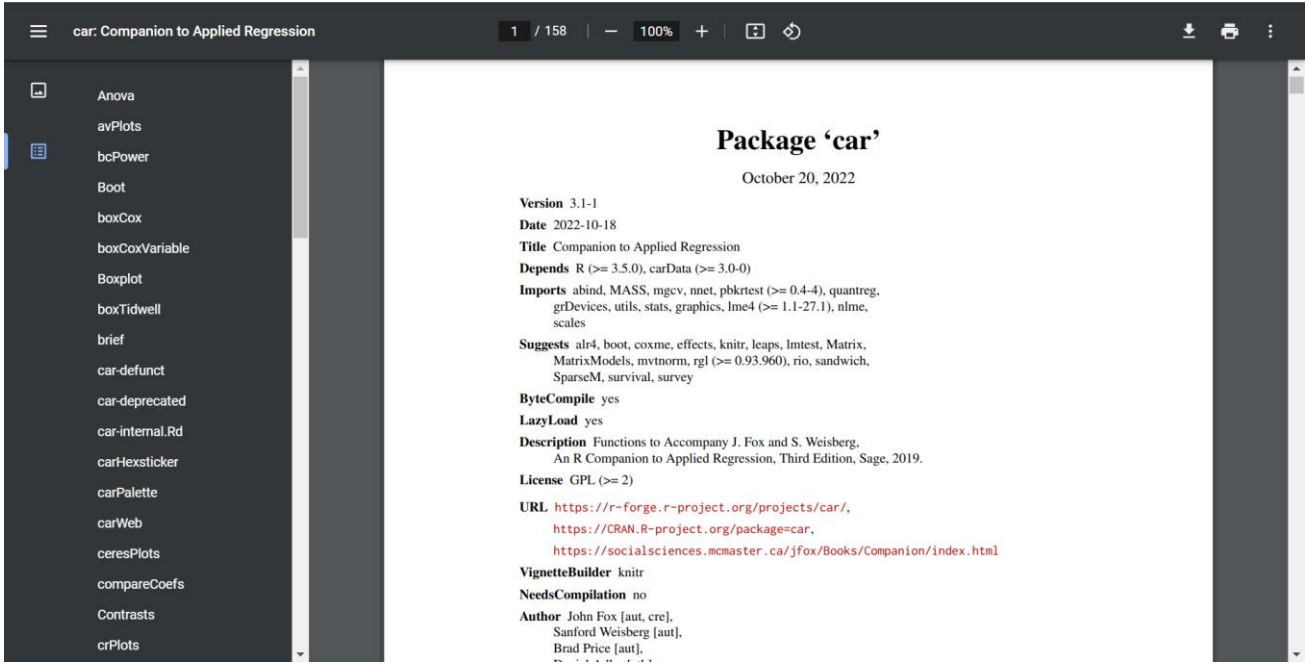
- Install





PACKAGE

- R-Documentation



03

IMPORT/EXPORT

.csv; .xlsx; .txt

IMPORT

Type	Example
Excel (.csv)	read.csv(“file location”, header = TRUE, sep = “;”)
Excel (.xlsx)	read_excel(“file location”) *library(readxl)
Notepad (.txt)	read.table(“file location”, header = TRUE)
SPSS (.sav)	read.spss(“file location”, use.value.labels = TRUE, to.data.frame = TRUE) *library(foreign)

EXPORT

Type	Example
Excel (.csv)	write.csv(data,"F:/try.csv")
Excel (.xlsx)	write_xlsx(data,"F:/try.txt") *library(writexl)
Notepad (.txt)	write.table(data,"F:/try.txt")
SPSS (.sav)	write_sav(data,"F:/try.sav") *library("haven")

04

LOAD DATA

Data Manipulation, Generate

ROW/COLUMN NAMES

- Row Names

  > rownames=c("...","...",...)
  > rownames(data)=data$X

- Column Names

  > colnames=c("...","...",...)

GENERATE DATA

- Vector Construction

```
> a=1:3              #1 2 3
> c(1, 1:3)          #1 1 2 3
```

- Sequence

```
> seq(1, 3)                    #1 2 3
> seq(1, 2, by = 0.1)          #1.1 1.2 1.3 1.4 ...
> seq(0, 6, length.out = 3)    #0 3 6
> rep(1:4, 2)                  #1 2 3 4 1 2 3 4
> rep(1:4, each = 2)           #1 1 2 2 3 3 4 4
> rep(c(7 ,9 ,3), 1:3)         #7 9 9 3 3 3
```

- Repetition

```
> rep(1:4, 2)                  #1 2 3 4 1 2 3 4
> rep(1:4, each = 2)           #1 1 2 2 3 3 4 4
> rep(c(7, 9, 3), 1:3)         #7 9 9 3 3 3
```

- Array

```
> array(1, 4)        #1 1 1 1
```

DATA MANIPULATION

- Length

  > a = c(2, 3, 1, 4)
  > length(a)

- Reverse

  > rev(a)

- Return i-th element of a

  > a[i]

- Delete i-th element of a

  > a[-i]

05

MATH OPERATIONS

ARITHMETIC OPERATIONS

Math Notation	R	Example
+	+	5+2 = 7
-	-	5-2 = 3
x	*	5*1 = 5
:	/	5/2 = 2/5
√	sqrt()	sqrt(4) = 2
x^n	x^n	2^2 = 4
y mod *x*	y %% x	5 %% 2 = 1
	y %/% x	5 %/% 2 = 2

Numerical Operations

R	Example (a=3.57)
print(a)	3.57
floor(a)	3
ceiling(a)	4
trunc(a)	3
round(a)	4

MATRIX OPERATOR

R	Definition
+	Addition of each matrix element
-	Subtraction of each matrix element
*	Multiply each element of the matrix
%*%	Matrix multiplication
solve	Inverse
t	Transpose
crossprod	X^TX
det	Determinant
diag	Diagonal

LOGICAL FUNCTION

R	Definition
<	Smaller
<=	Smaller or equal
>	Bigger
>=	Bigger or equal
!=	Unequal
==	Logical equal
!	Logical NOT (unary)
&	Logical AND (vector)
|	Logical OR (vector)
&&	Logical AND (no vector)
||	Logical OR (no vector)

THANKS

https://intip.in/KomstatC2023