

Introduction to



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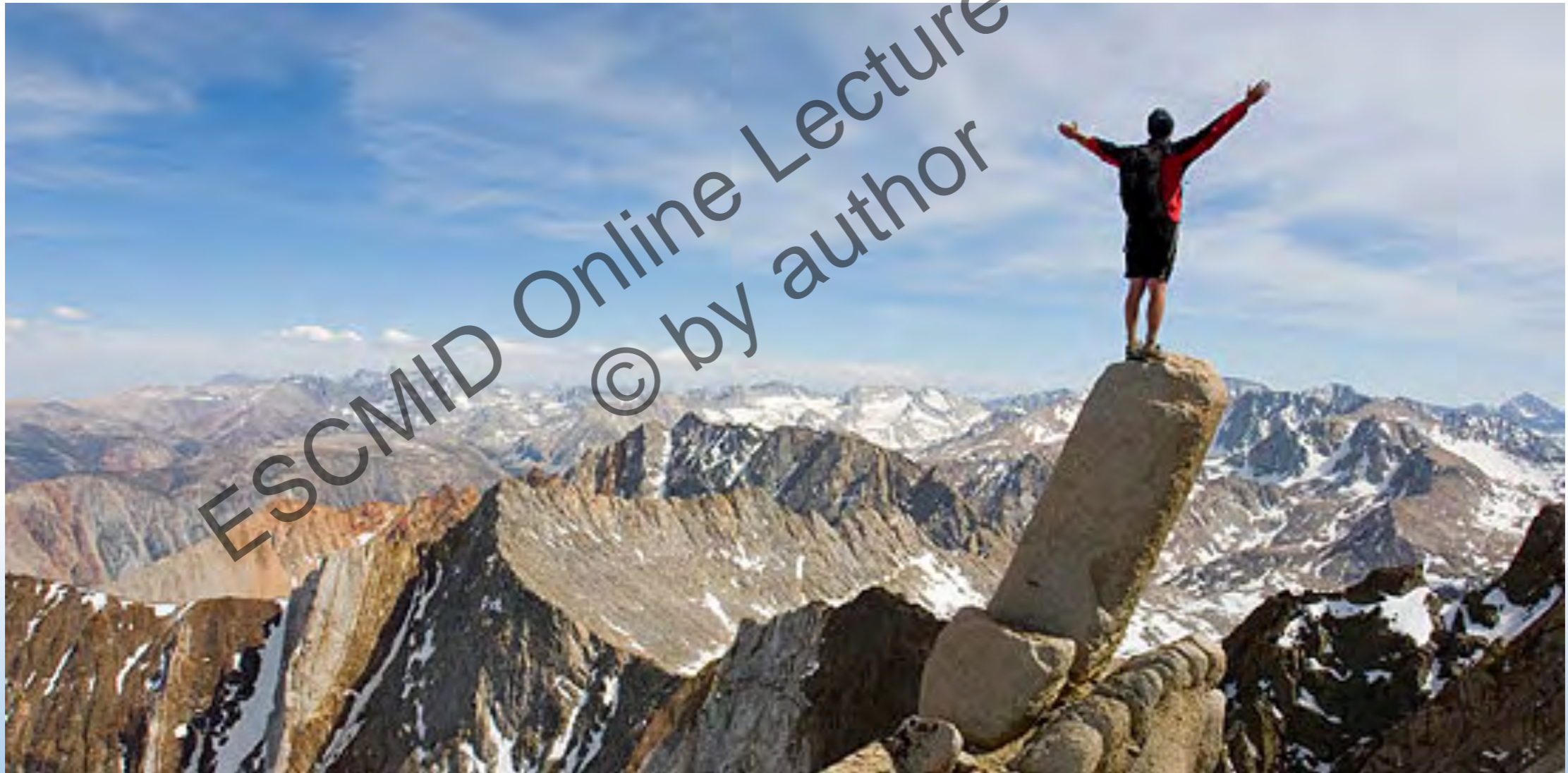
Don't Panic



The curve is steep...



But the reward is great





KEEP

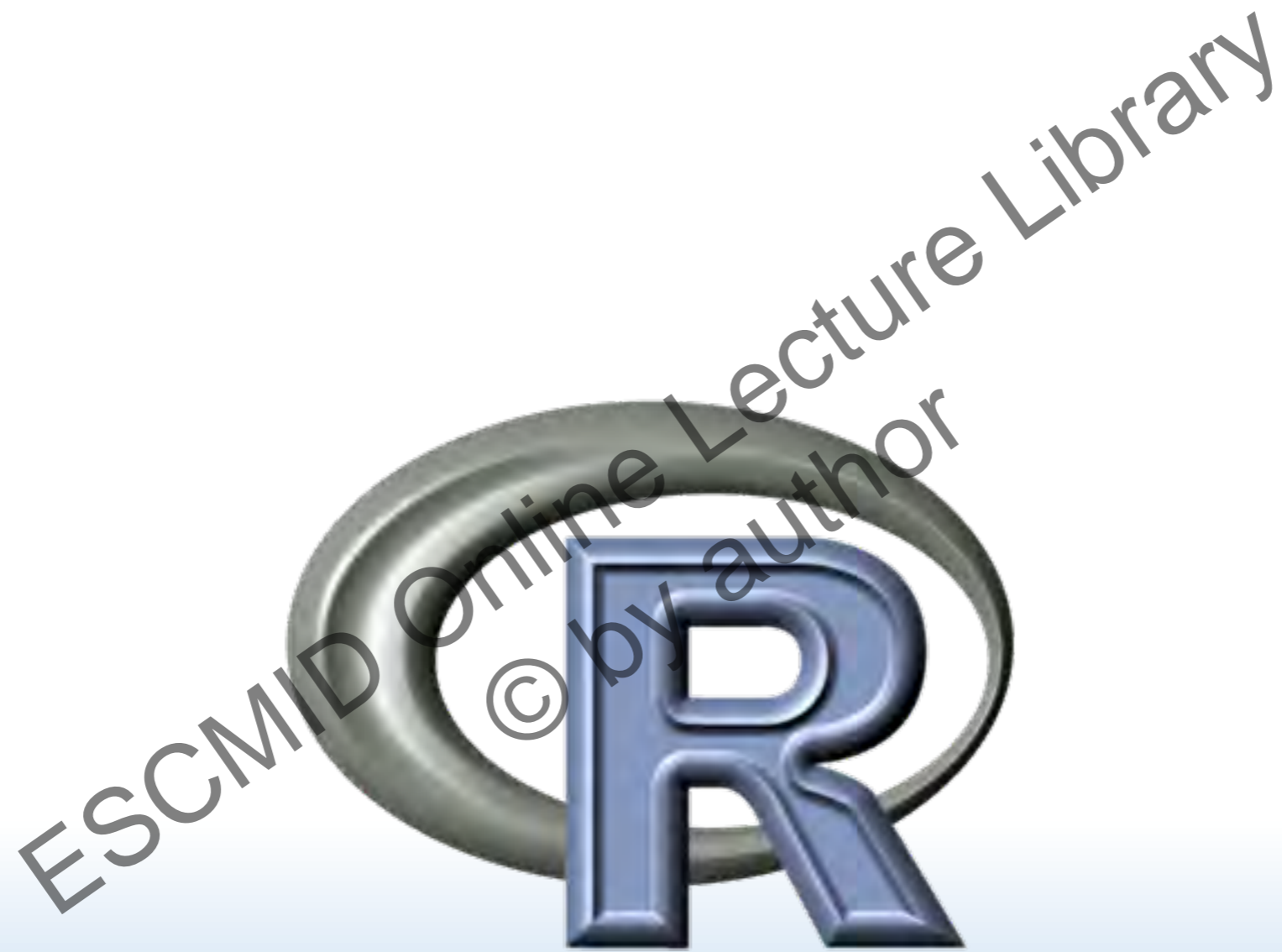
CALM

AND

CARRY

ON

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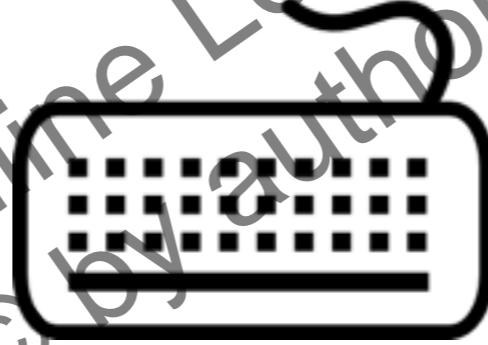


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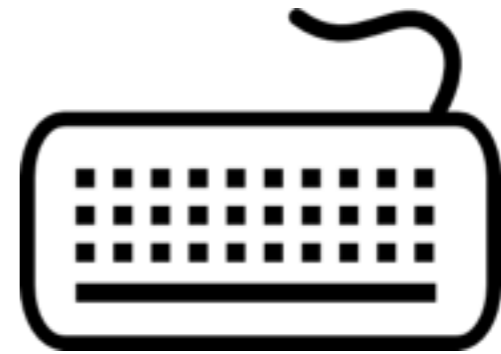


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R Packages

library(package)

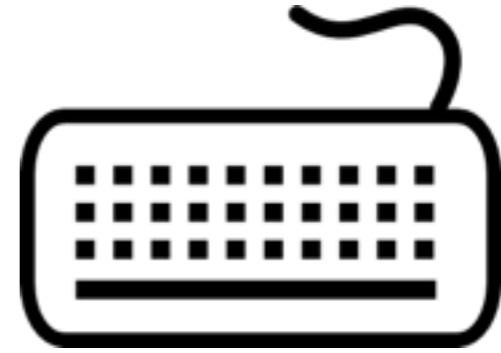


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Data files

`setwd("~/path")`



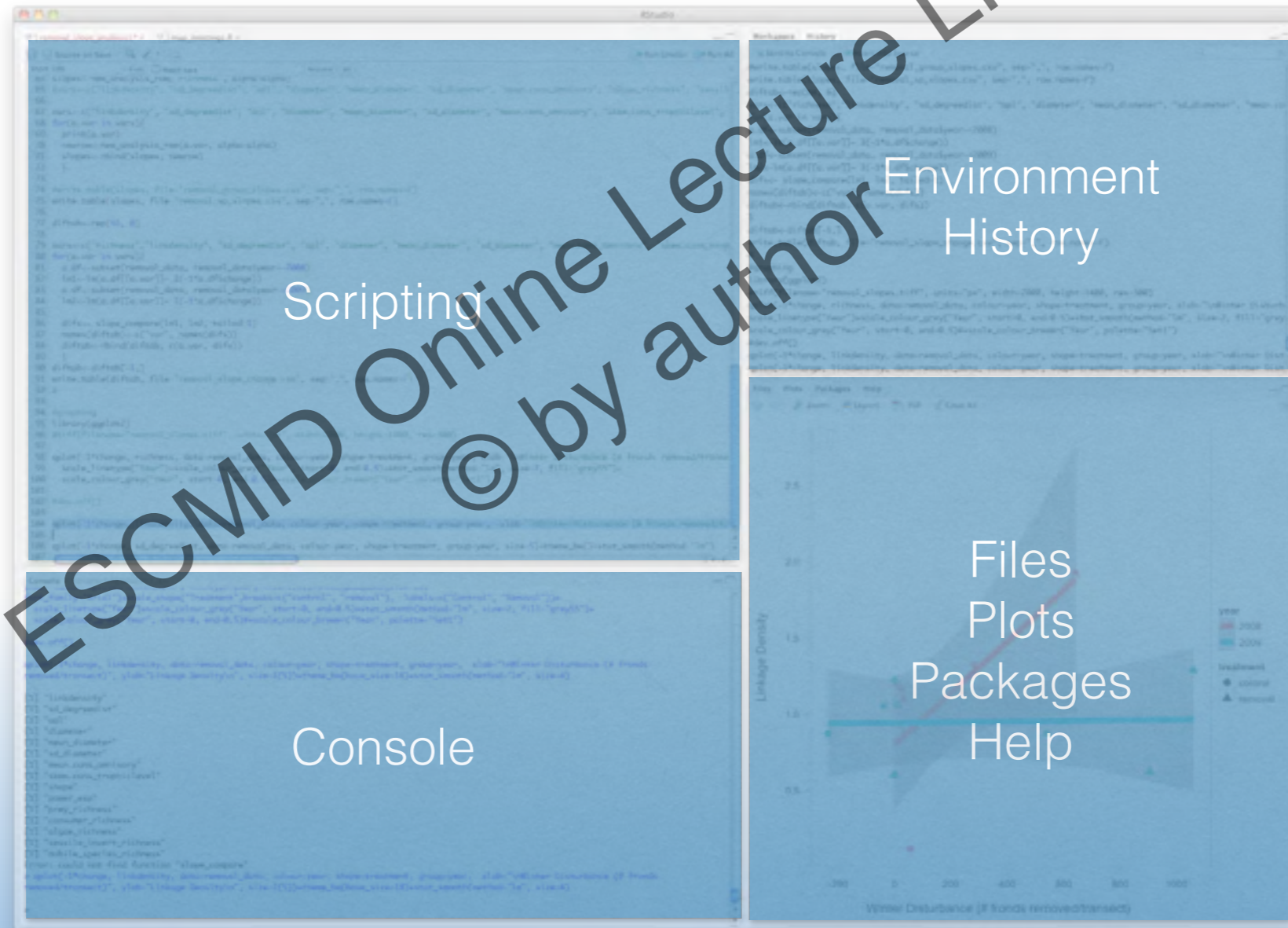
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The Rstudio IDE

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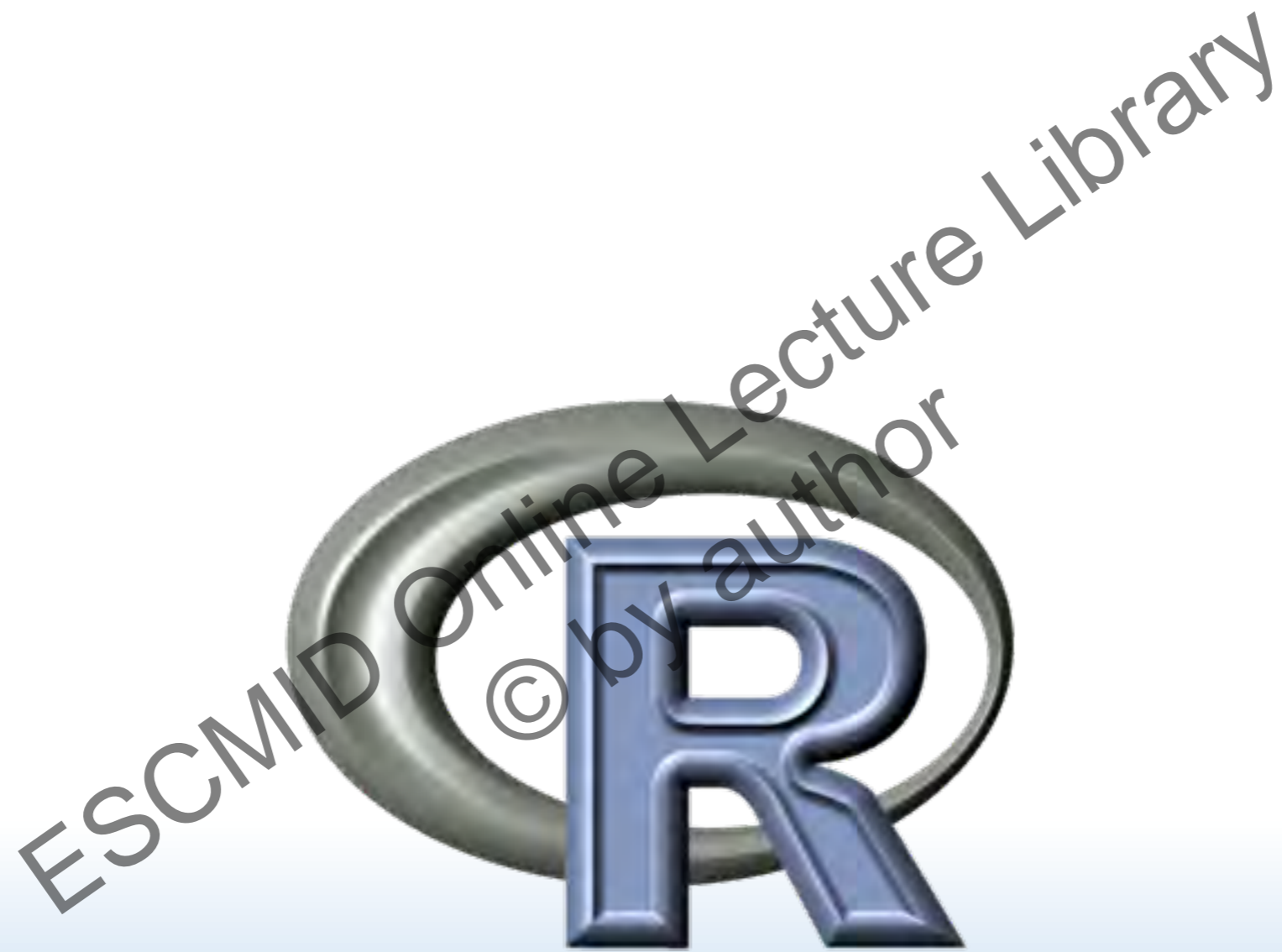
The screenshot displays the RStudio IDE interface. The top-left pane contains R code for data analysis, including functions for data manipulation and plotting. The top-right pane shows the 'Workspaces' and 'History' tabs. The bottom-left pane displays the console output, listing various variables and data types. The bottom-right pane shows a plot titled 'Linkage Density' on the y-axis (ranging from 0.5 to 2.5) and 'Wier Disturbance (# fronds removed/trassect)' on the x-axis (ranging from -200 to 1000). The plot features two regression lines: a red line representing the '2008' treatment and a cyan line representing the '2009' treatment. Both lines show a positive correlation between disturbance and linkage density. Shaded grey areas around the lines represent confidence intervals. A legend on the right side of the plot identifies the 'year' (2008 in red, 2009 in cyan) and 'treatment' (control in black circles, removed in black triangles).

The Rstudio IDE



R Data Types

	Homogeneous	Heterogeneous
1-dimensional	Vector <small>logical, integer/factor, double (often called numeric), and character</small>	List
2-dimensional	Matrix	Data frame
n-dimensional	Array	



R Subsetting

	Simplifying	Preserving
Vector	<code>x[[1]]</code> unnamed value 1	<code>x[1]</code> named value 1
List	<code>x[[1]]</code> contents of list 1	<code>x[1]</code> list 1
Factor	<code>x[1:4,drop=T]</code> hide unused levels	<code>x[1:4]</code> show all levels
Matrix/Array	<code>x[1,]</code> or <code>x[,1]</code> drop dimensions	<code>x[1,,drop=F]</code> or <code>x[,1,drop=F]</code> keep dimensions
Data Frame	<code>x[,1]</code> or <code>x[[1]]</code> vector	<code>x[,1,drop=F]</code> or <code>x[1]</code> data frame

R functions



- `function(argument1, argument2, ...)`
- `function(argument1=value1, ...)`

Generic functions

- Call specific methods
- The call depends on the key argument, usually the first
- This is known as **method dispatch**

Example

plot(x,...)

plot.default()

plot.formula()

plot.PMcov()

plot.PMnpde()

plot.data.frame()

plot.histogram()

plot.PMcycle()

plot.PMop()

plot.density()

plot.lm()

plot.PMfinal()

plot.PMpta()

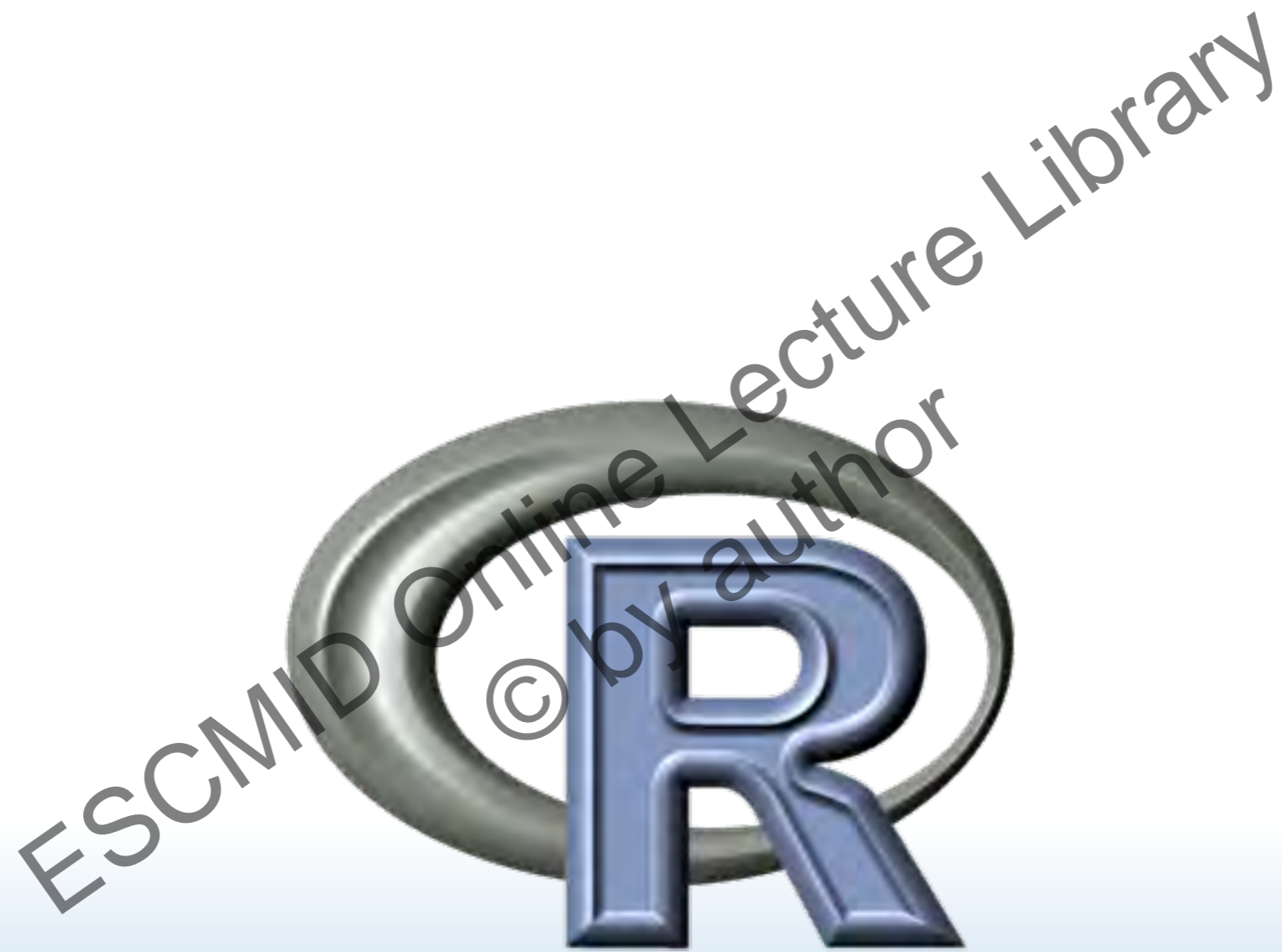
plot.factor()

plot.MMopt()

plot.PMmatrix()

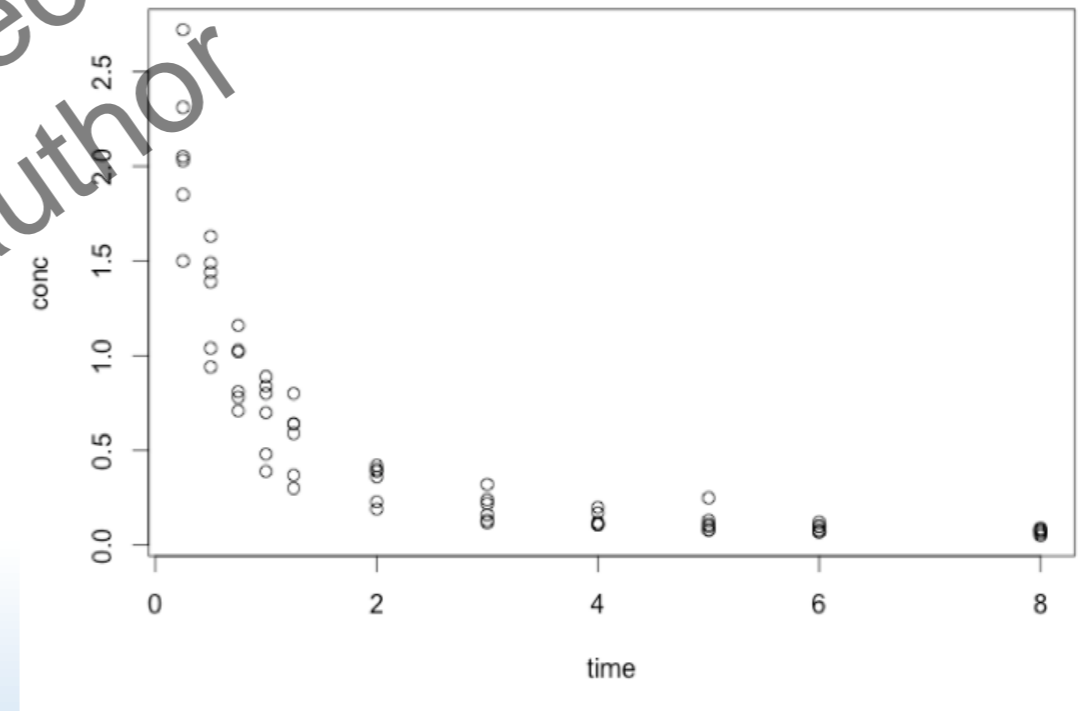
plot.PMsim()

methods("plot")



Plots

- `plot(x, y, ...)`
- `plot(y~x, data, ...)`





Extending R



[CRAN](#)
[Mirrors](#)
[What's new?](#)

Available Packages

Currently, the CRAN package repository features 5761 available packages.

[Table of available packages, sorted by date of publication](#)

[Table of available packages, sorted by name](#)

Contributed Packages

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Resources

- CRAN: <http://www.cran.r-project.org>
- Beginners: <http://www.computerworld.com/s/article/9239625/>
[Beginner s guide to R Introduction](#)
- 60+ resources: <http://www.computerworld.com/s/article/9239799/60> [R resources to improve your data s kills](#)

Homework

- Use R to do the following:
 1. Write and execute a script to load sample time-concentration data
 2. Plot the sample data with linear and semi-log axes; change features of the plot such as color or type
 3. Find the maximum concentration, the minimum concentration and the average concentration
- Download the file from www.lapk.org/Training/Pmetrics/Homework/sample.csv