

# Introduction to R

## 1) Install R on the laptops

Go to <https://www.r-project.org> or directly to <https://cran.ma.imperial.ac.uk>

Can also download R studio at <https://rstudio.com/products/rstudio/download/>

## 2) Most used R packages

The list of all R packages is available here:

[https://cran.r-project.org/web/packages/available\\_packages\\_by\\_name.html](https://cran.r-project.org/web/packages/available_packages_by_name.html)

Main packages:

- **stats**: fundamental basic library for statistical analysis. Contains distributions, statistical tests, density, linear models, lag of time series, some plot functions, standard deviation, etc.
- **tsseries**: time series analysis and computational finance.
- **astsa**: Applied Statistical Time Series Analysis. Contains for example: acf1 (plot ACF), acf2 (plot ACF and PACF), sarima, tsplot (TS plot), etc.
- **lmtest**: Testing linear regression models. Contains for example: bptest, gqtest, hmcetest (test for Heteroskedasticity), grangertest (Granger causality test), etc.
- **moments**: Moments, cumulants, skewness, kurtosis and related tests. For example: jarque.test (Normality test), skewness, kurtosis, moment.
- **forecast**: Forecasting Functions for Time Series and Linear Models.
- **ggplot2**: Creates elegant Data Visualisations Using the Grammar of Graphics.
- **zoo**: Methods for totally ordered indexed observations. It aims at performing calculations containing irregular time series of numeric vectors, matrices and factors. The zoo package interfaces to all other time series packages on CRAN. It does not provide modelling functionalities.
- **Rblpapi**: R interface to Bloomberg. Examples: bdh (Data history queries, similar to XL), lookupSecurities (look up tickers), etc.
- **quantmod**: Quantitative Financial Modelling Framework. Enables for example to download data from Yahoo Finance.

Additional packages:

- **Caret**: Machine learning (Classification And REgression Training) package, for complex regression and classification problems.
- **Glmnet**: Lasso and Elastic-Net Regularized Generalized Linear Models.
- **fUnitRoots**: Modelling Trends and Unit Roots.
- **nortest**: Test for normality.
- **plyr**: Tools for Splitting, Applying and Combining Data.

## 3) Comments

If want to use Rblpapi to download Bloomberg data:

```
library(Rblpapi)
blpconnect()
```