

# THE BEGINNER'S GUIDE TO

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## Installing R packages

1. Google for the R package you desire.
2. Open R and give the package installation command.
  - `> install.packages("ggplot2")`
  - You would be asked to choose a mirror. Just choose one close to you — if the mirror is broken, try another one.
3. Have some tea and wait for the installation to finish.
4. After the installation has finished, load the library.
  - `> library("ggplot2")`
5. **Read its manual and enjoy.**

## R datatypes

- R has a wide variety of data types including —
  - **Scalars**
  - **Vectors** (numerical, character, logical)
  - **Matrices**
  - **Data frames**
  - **Lists**
- We could use `class(objectName)` to find out which type an R object is.

# All source codes available via: <http://web.hku.hk/~liym1018/workshops/R101/R101-codes.R>  
(Shortened URL: <https://goo.gl/IBRYI5>)

## R operators

Operator	Description
<code>+</code>	Addition
<code>-</code>	Subtraction
<code>*</code>	Multiplication
<code>/</code>	Division
<code>^</code> or <code>**</code>	Exponentiation
<code>x %% y</code>	x mod y (5 %% 2 is 1)
<code>x %/% y</code>	Integer division (5 %/% 2 is 2)

Operator	Description
<code>&lt;</code>	Less than
<code>&lt;=</code>	Less than or equal to
<code>&gt;</code>	Greater than
<code>&gt;=</code>	Greater than or equal to
<code>==</code>	Exactly equal to
<code>!=</code>	Not equal to
<code>!x</code>	Not x
<code>x   y; x    y</code>	x OR y (  is vectorized)
<code>x &amp; y; x &amp;&amp; y</code>	x AND y (& is vectorized)
<code>isTRUE(x)</code>	Test if x is TRUE

### Operator precedence

1. `^`
  2. `%%` and `%/%`
  3. `*` and `/`
  4. `+` and `-`
  5. `<`, `>`, `<=`, `>=` and `!=`
  6. `!`
  7. `&` and `&&`
  8. `|` and `||`
  9. `<-`
  10. `=`
- **Associativity**: Left to right, except for exponentiation and assignment
  - **Parentheses** override order

### Useful commands

- `?<function name>` to check manual!
  - `install.packages()`, `library()`
  - `read.table()`, `read.csv()`, `save()`
  - `write.table()`, `write.csv()`, `load()`
  - `seq()`, `rep()`
  - `mean()`, `var()`, `max()`, `min()`
  - `order()`, `sort()`
  - `str()`
  - `head()`, `tail()`
  - `hist()`
  - `plot()`