```
help.start( )               - Start the html full doc.
?<function>             - Returns doc about <function>. or help()
example( <function> )       - Returns an example of the function.
?regex                  - Help with regex.
---------------------------------------------------------------------------------
------------------- Objects
foo_boo <- TRUE             - Logical.
cow_int <- 2L                   - Integer.
bar_num <- 10.0             - Numeric.
foo_cplx <- 3+2i            - Complex.
cow_raw <- "Hello"          - String.
foo_vec <- c(1,5,7)         - Vector.
bar_list <- list('a',1)         - List.
cow_mt <- matrix(           - Matrices.
    c(), nrow=2, ncol=3 )
foo_array <- array(         - Array.
    c(1:2), dim=c(4,2,3) )
bar_fct <- factor( c(1,3,2,3) ) - Factor, store elem vec with counts.
cow_df <- data.frame(       - Data frame, organized matrix.
    uid=c(12, 29,15),
    weight=c(81,93,78),
    age=c(42,38,26) )
Var Handeling:
    class( cow )            - Print obj type.
    str( cow )              - Print obj structures.
    summary( cow )          - Show everything, EVERYTHING !
    cow$uid or cow[[2]]     - Print df->uid sub set .
    ls() or objects()           - Show all variables.
    rm( list=ls( ) )            - Delete all variables.
    gc()                    - Calls garbage collector.
---------------------------------------------------------------------------------
--------------- Operators
All purpose Op:             - Works with all obj types.
    +       - Add.          -       - Sub.
    *       - Mult.         /       - Div (float).
    %%      - Remainder.        %/%     - Div (int).
    **      - Exp.          !       - NOT, Op values.
    &       - Bitwise AND.      |       - bitwise OR.
    %in%    - Value Match.      :       - Seq creator.
    %*%     - Matrix Mult.      %x%     - Kronecker products
Logical Op:
    &&      - Logical and.      ||      - Logical or.
    >       - Bigger.           <       - Smaller.
    ==      - Equal.            <=      - Smaller or Eq.
    >=      - Bigger or Eq.     !=      - Not Eq.
-------------------- Conditional ----------------------------- Loop -------------
----------- Function
 if ( condition) {            while ( condition ) {     name <- function(
... code_a           ...    code_a             ...  arg_1,\
} else if( condition) {      }                     ...  arg_2=default ) {
... code_b                                 ...      code_a
} else {                 for ( vector ) {          }
... code_c           ...    code_a
}                    }
```

```
    - R has optimize switch conditional.
---------------------------------------------------------------------------------
----- Build-in Functions
String:
    paste( ..., sep="" )
    strsplit( x, split )
    names( foo_vec ) <- c("Age","Taxes")
    substr( x, start=n1, stop=n2 )
    grep( pattern, x , ignore.case=FALSE, fixed=FALSE )
    sub( pattern, repl, x, ignore.case =FALSE, fixed=FALSE )
    format( x, digits, nsmall, scientific, width, justify )
Vector:
    foo <- seq(5, 9, by = 0.4)  - Creates a num vec, or 5:9
    bar <- c('Mon','Tue')       - Creates a misc elem.
    rep(x, ntimes)          - Rep x n times.
    cut(x, n)               - Cut vec at index=n.
    sort( foo )             - Sort vec.
Math:
    abs(x)  sqrt(x) ceiling(x)  floor(x)    trunc(x)    exp(x)
    cos(x)  acos(x)     cosh(x) acosh(x)    tan(x)  atanh()
    sin(x)  asin(x) sinh(x) asinh(x)    atan(x) tanh(x)
    log(x)  log10(x)    signif(x, digits=n) round(x, digits=n)
Matrix
    dim( a_vec ) <- c(2,4)      - Converts a_vec to a matrix.
    persp( a_mtx )          - 3D plot of matrix.
    image( a_mtx )          - Create a heatmap.
     -~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Statistics
mean( a_vec )               - Mean of a_vec values.
median( a_vec )             - Median value of a_vec.
sd( a_vec )             - Standard deviation.
factor( a_vec )             - Make sense of a_vec.
as.interger( a_factor)          - Show factors as int no summarize..
levels( a_factor )          - Show all factor as inter
cor.test( a_df )                - Correlation Test.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Data Manipulation
colnames( a_df ) <- c("cow")    - Give a_df cols names.
rownames( a_df ) <-("foo")      - Give a_df rows names.
merge( a_df, b_df )         - Merge two data frames.
-~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ In-Output
print("Hello Wolrd",a_df)   - Print msg, or cat("str") [ do not use write() ]
list.files()                - List all .R files in dir.
file.show( 'cow' )          - Show contents of cow.
source("foo.R")             - Load foo.R code.
read.table("cow")           - Load data from cow. [ read.delim( ), read.csv() ]
write.table( "cow" )        - Write a obj in table format.
save( obj )                 - Saves Rs obj outside R env.
sink( "cow" )               - Save all subseq R output to a file, sink() to end.
dev.off()                   - Flush and close the output file.

-~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Graphics
---------------------------------------------------------------------------------
-------------------------------------- Plot
plot( y_vec, x_vec, )           - Create a simple plot.
persp( a_mtx )              - 3D plot of matrix.
image( a_mtx )              - Create a heatmap.
abline()                    - Adds straight lines through the current plot.
```

```
legend()                    - Create a legend to the plot.
--~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Regression
lm( y_vec ~ x_vec )         - Linear.
predict( lm(), new_data )       - Simulate new data using lm().
nls( y_vec ~ b1*x_vec^2+b2 )    - Non-linear functions.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Reserved Words
if      else        repeat  while   function    NA_integer_     ...
for         next        break   TRUE    NA_real_    NA_character_   NA
in      FALSE   NULL    Inf         NaN         NA_complex_
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~  System
system( cmd )               - Exec system [ GNU/Linux ] cmd.
dir()                       - Reads content of current working directory.
getwd()                     - Returns current working directory.
setwd( "/home/cow" )        - Changes current working directory.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ Flags
R [ Flag ]:
    --slave             - Makes R run as quietly.

--~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ LIBRARIES
install.pa•ckages( "cow" )
library( )                  - Show all available libs.
library( "cow" )                - Load lib cow.
libraryr(help= "cow" )          - Return cows doc.
search()                    - Show loaded libs.
---------- GGPLOT2
qplot( )
---------- RSQLite
---------- RMYSQL
---------- XLSX
---------- FOREIGN
---------- DPLYR
---------- data.table
---------- XML
---------- RColorBrewer
---------- HMISC
---------- READXL
---------- READR
---------- ggvis
---------- lattice
---------- stringr
---------- HTMLWIDGETS
.......... LEAFTLET
.......... DIAGRAMMER
---------- GGMAP
---------- MAPTOOLS
---------- PARALLEL
---------- RCPP
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ CLEAN CODE
    - Use <- as assigment operator.
    - Dont start var names w/ . ,they are hiden var.


                    Who are you who are so wise in the ways of science?
                                            - Contesini [Apr/2016]
```