# IPython Interactive Python shell

## CONCEPTS

> Magics start with % (line) or %% (cell). With automagic on, the % may be left off.

**In[n]** your input
↓ runs
**Out[n]** result
↓ saved as
**_ __ ___** last 3 outputs

## HELP AND INSPECTION

`<obj>?`
Show docs for an object

`<obj>??`
Show source code too

`<obj>.<TAB>`
Complete attributes and methods

`%<magic>?`
Docs for one magic

## RUNNING CODE

`%run <script.py> <args>`
Run a script in this session

`%load <file>`
Load code into the prompt

`%paste`
Paste clipboard code as-is

## TIMING

`%time <stmt>`
Time one run

`%timeit <stmt>`
Time many runs, average

## HISTORY AND OUTPUT

`%history`
Show session input

`In[<n>]`
Input of cell n

## HISTORY AND OUTPUT (cont.)

`Out[<n>]`
Output of cell n

`_ / __ / ___`
Last three outputs

## SHELL AND SYSTEM

`!<command>`
Run a shell command

`<var> = !<command>`
Capture output as a list

`!<command> {<pyvar>}`
Insert a Python value

`%%bash`
Run the cell in bash

`%cd <dir>`
Change directory

`%pip install <pkg>`
Install into this environment

## DEBUGGING

`%debug`
Open pdb after an exception

`%pdb on`
Debug every uncaught error

## MODULES AND WORKSPACE

`%load_ext autoreload`
Enable the extension

`%autoreload 2`
Reload all before each run

`%who`
List variable names

`%whos`
List variables with types

## CONFIG AND SHORTCUTS

`ipython -i <script.py>`
Run, then stay interactive