# 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