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

Install with pip install ipython and start it with ipython.

HELP AND INSPECTION

<obj>?
Show docs for an object

<obj>??
Show source code too

<obj>.<TAB>
Complete attributes and methods

***<pattern>*?**
Search names by wildcard

%<magic>?
Docs for one magic

RUNNING CODE

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

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

%edit
Compose input in your editor

%paste
Paste clipboard code as-is

%cpaste
Paste block, end with --

%%writefile *<file>*
Write the cell to a file

%reset
Clear all variables

TIMING

%time *<stmt>*
Time one run

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

%%time
Time the whole cell

TIMING (cont.)

%%timeit
Time a cell, with setup line

HISTORY AND OUTPUT

%history
Show session input

%history -n
Include line numbers

%history -g *<text>*
Search all stored history

%rerun
Re-run the previous line

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

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

%pwd
Print working directory

%env *<VAR>*=*<value>*
Set an env variable

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

DEBUGGING

%debug
Open pdb after an exception

%pdb on
Debug every uncaught error

%xmode Verbose
Richer tracebacks

%tb
Show last traceback again

MODULES AND WORKSPACE

%load_ext autoreload
Enable the extension

%autoreload 2
Reload all before each run

%autoreload 1
Reload only %aimport modules

%who
List variable names

%whos
List variables with types

%matplotlib inline
Plot inside the frontend

CONFIG AND SHORTCUTS

ipython profile create
Create default config files

ipython --profile=*<name>*
Start with a profile

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

Keyboard

Key	Does
Tab	Complete or cycle
Ctrl+R	Search history
Ctrl+O	Open new line
Esc Enter	Force run block
Ctrl+L	Clear screen
Ctrl+D	Exit

Startup scripts: put .py or .ipy files in ~/.ipython/profile_default/startup/; they run in filename order.

RECIPES

Edit a module and keep going

```
%load_ext autoreload
%autoreload 2
import mymod
mymod.run()
# edit mymod.py, then call again
```

Debug a failing script

```
%run script.py
%debug
# or start under pdb from the
top:
%run -d script.py
```

Compare two implementations

```
%timeit sorted(data)
%timeit -n 100 -r 5
list_sort(data)
```