

INTRO TO DATA SCIENCE

PYTHON AND LINEAR ALGEBRA REVIEW

QUESTIONS?

WHAT WAS THE MOST INTERESTING THING YOU LEARNED?

WHAT WAS THE HARDEST TO GRASP?

I. JUPYTER NOTEBOOK

II. PYTHON

III. PYTHON EXERCISE

- Understand Python data structures, including strings, lists, tuples, etc.
- Understand Python flow control
- Understand how to load data from a file in Python
- Review linear algebra concepts such as matrix, vector, and dot product
- Be able to use those concepts in Python

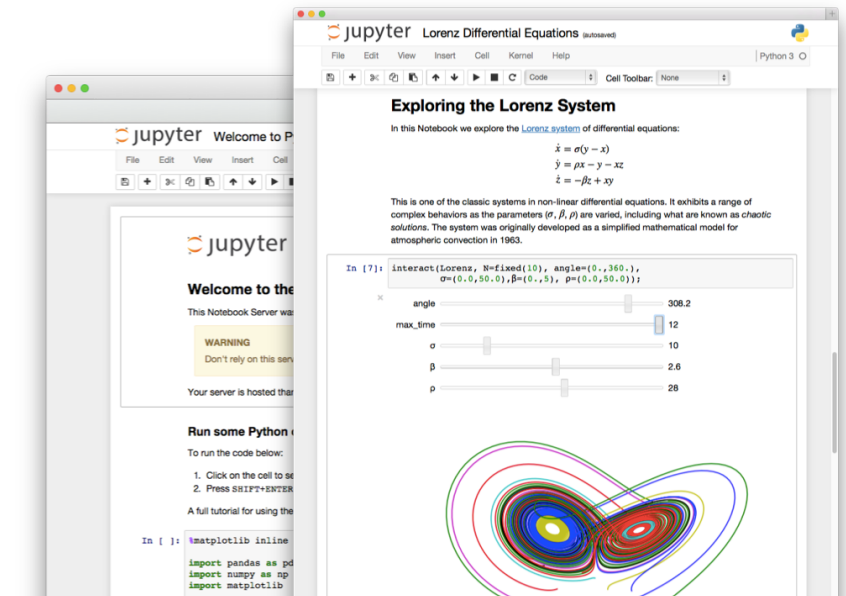
INTRO TO PYTHON

JUPYTER NOTEBOOK OVERVIEW

The Jupyter Notebook is a web application that allows you to create and share documents that contain live code, equations, visualizations and explanatory text.

Uses include:

- *data cleaning and transformation*
- *numerical simulation*
- *statistical modeling*
- *machine learning*
- *and much more.*



Jupyter Architecture

The Jupyter Notebook is based on a set of open standards for interactive computing. Think HTML and CSS for interactive computing on the web. These open standards can be leveraged by third party developers to build customized applications with embedded interactive computing.



Notebook
Document Format

[Learn more](#)



Interactive
Computing Protocol

[Learn more](#)



The Kernel

[Learn more](#)

Jupyter Architecture

The Jupyter Notebook is based on a set of open standards for interactive computing. Think HTML and CSS for interactive computing on the web. These open standards can be leveraged by third party developers to build customized applications with embedded interactive computing.

The Notebook Document Format

Jupyter Notebooks are an open document format based on JSON. They contain a complete record of the user's sessions and embed code, narrative text, equations and rich output.

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Interactive Computing Protocol

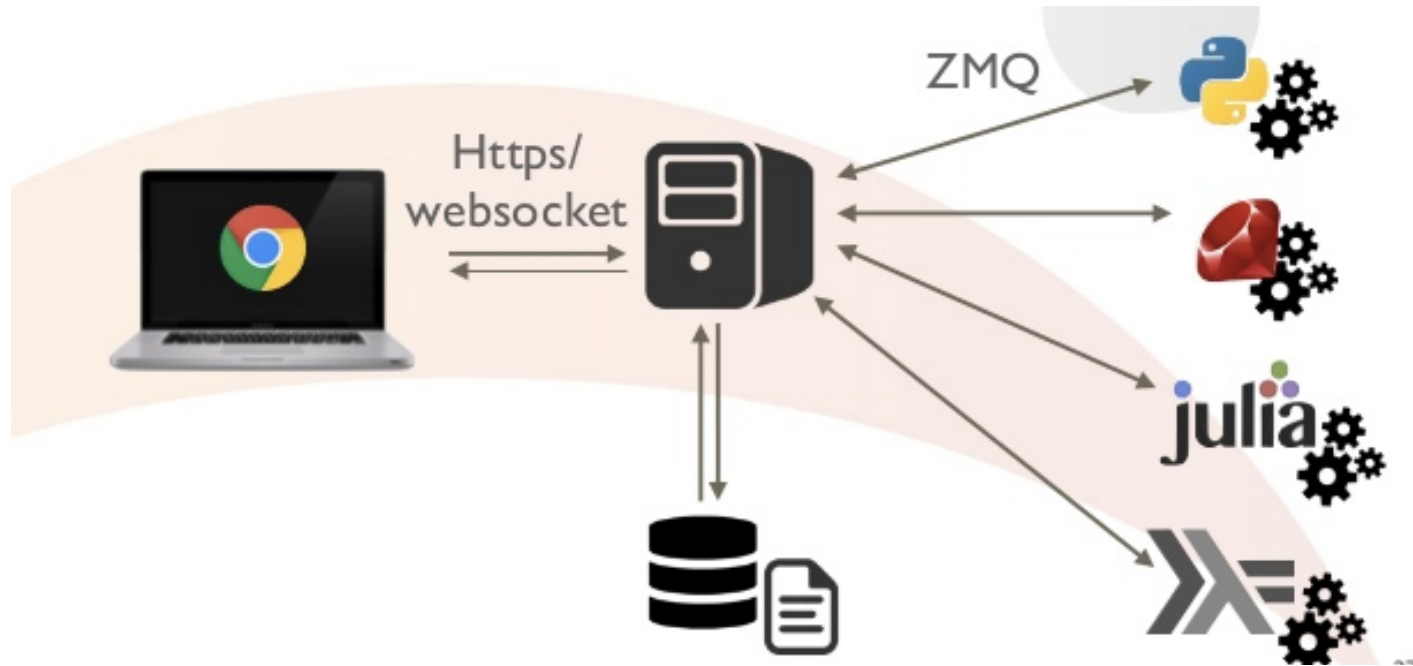
The Notebook communicates with computational Kernels using the Interactive Computing Protocol, an open network protocol based on JSON data over ZMQ and WebSockets.

[Go back](#)

The Kernel

Kernels are processes that run interactive code in a particular programming language and return output to the user. Kernels also respond to tab completion and introspection requests.

[Go back](#)





Files

Running

Clusters

Select items to perform actions on them.

Upload

New ▾



<input type="checkbox"/>	<input type="checkbox"/>	Home
<input type="checkbox"/>		homework
<input type="checkbox"/>		labs
<input type="checkbox"/>		lectures
<input type="checkbox"/>		README.md



50+ kernels available!

<https://github.com/ipython/ipython/wiki/IPython-kernels-for-other-languages>

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New ▾



homework



labs



lectures



README.md

Text File

Folder

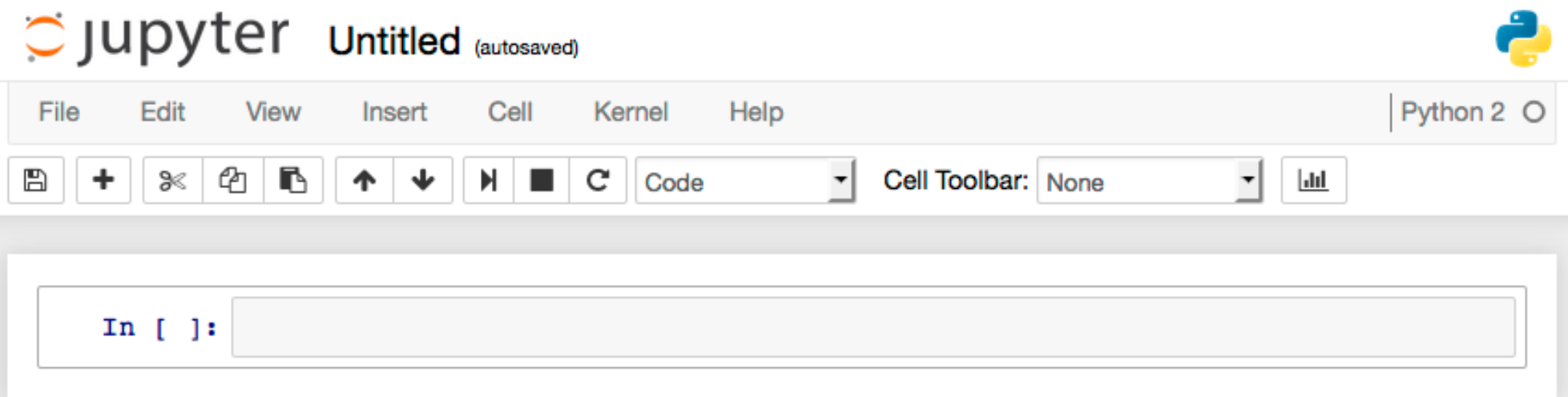
Terminal

Notebooks

Julia 0.4.0

Python 2

iTorch



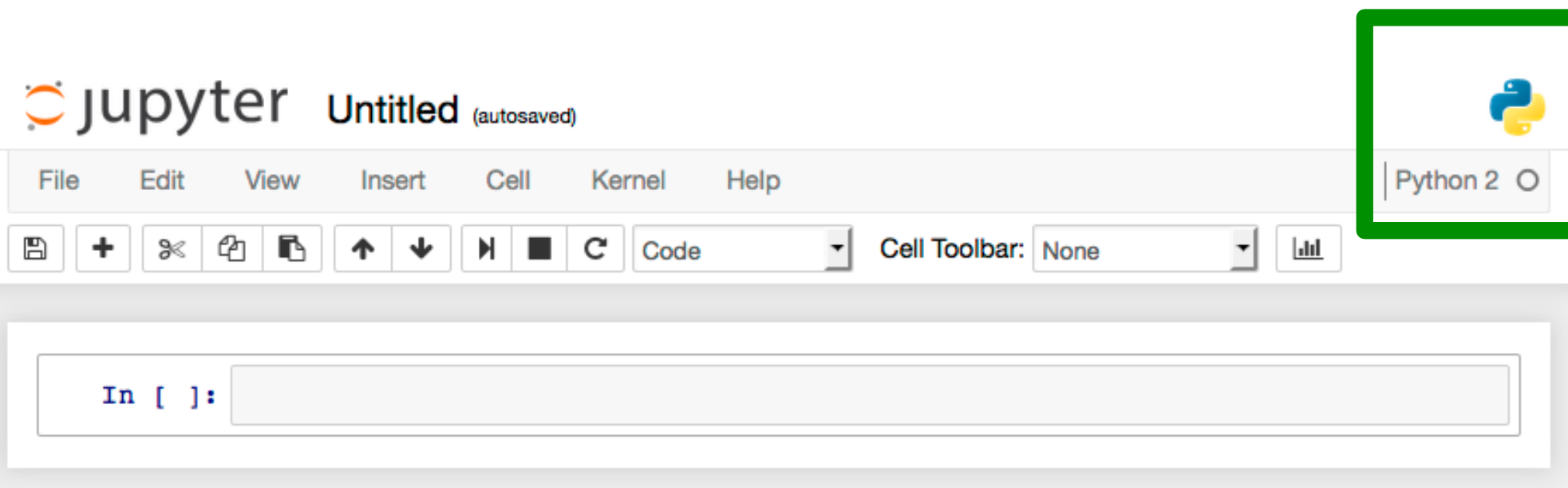
The image shows the Jupyter Notebook interface. At the top, the Jupyter logo is followed by the text "Untitled (autosaved)" and the Python logo. Below this is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, and Help. To the right of the menu bar is a dropdown menu showing "Python 2". Below the menu bar is a toolbar with icons for saving, adding a new cell, cutting, copying, pasting, undo, redo, and a cell type dropdown menu currently set to "Code". To the right of the toolbar is a "Cell Toolbar" dropdown menu set to "None" and a button with a bar chart icon. The main area of the notebook is a large text input field with the prompt "In []:" followed by a blank space for code.

jupyter Untitled (autosaved) Python 2

File Edit View Insert Cell Kernel Help

Save Add Cut Copy Paste Undo Redo Code Cell Toolbar: None

In []:



The image shows the Jupyter Notebook interface. At the top, the title bar displays the Jupyter logo, the text "jupyter", and "Untitled (autosaved)". Below this is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, and Help. A secondary toolbar contains icons for saving, adding a new cell, cutting, copying, pasting, navigating between cells, and running the current cell. The cell type is set to "Code". To the right of the toolbar, a dropdown menu shows "Cell Toolbar: None". On the far right, a green-bordered box highlights the Python 2 logo and the text "Python 2". Below the toolbar, a code cell is visible, starting with the prompt "In []:" followed by an empty input area.

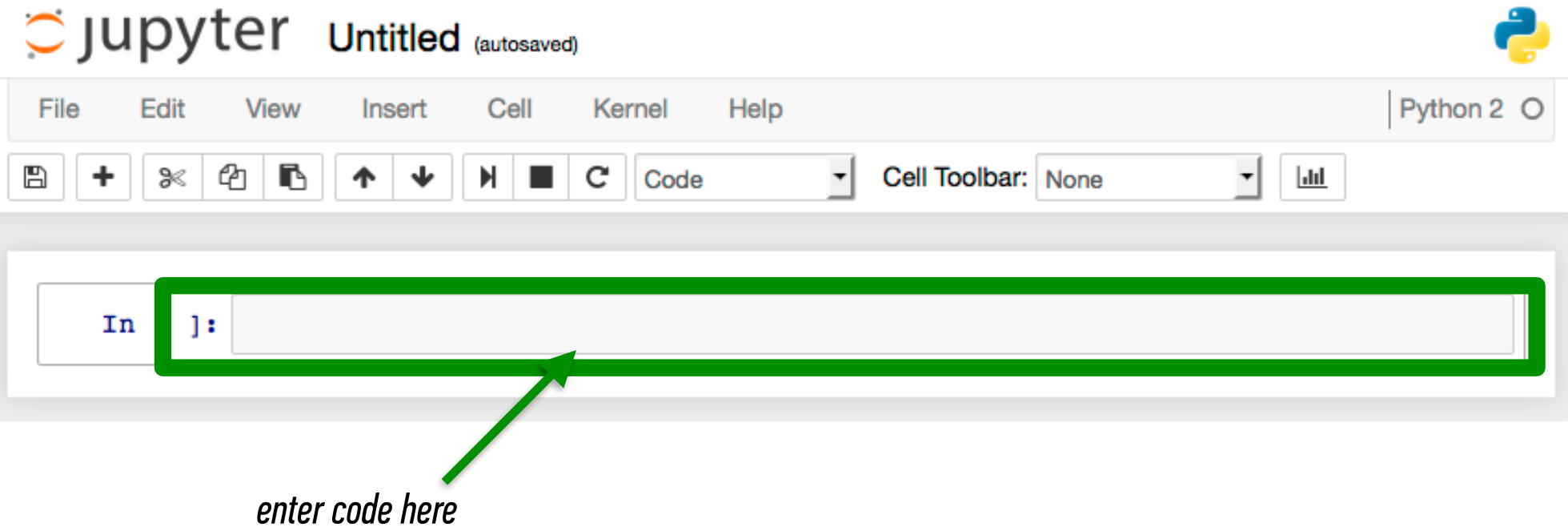
jupyter Untitled (autosaved)

File Edit View Insert Cell Kernel Help

Save Add Cut Copy Paste Up Down Run Stop Restart Code Cell Toolbar: None

Python 2

In []:



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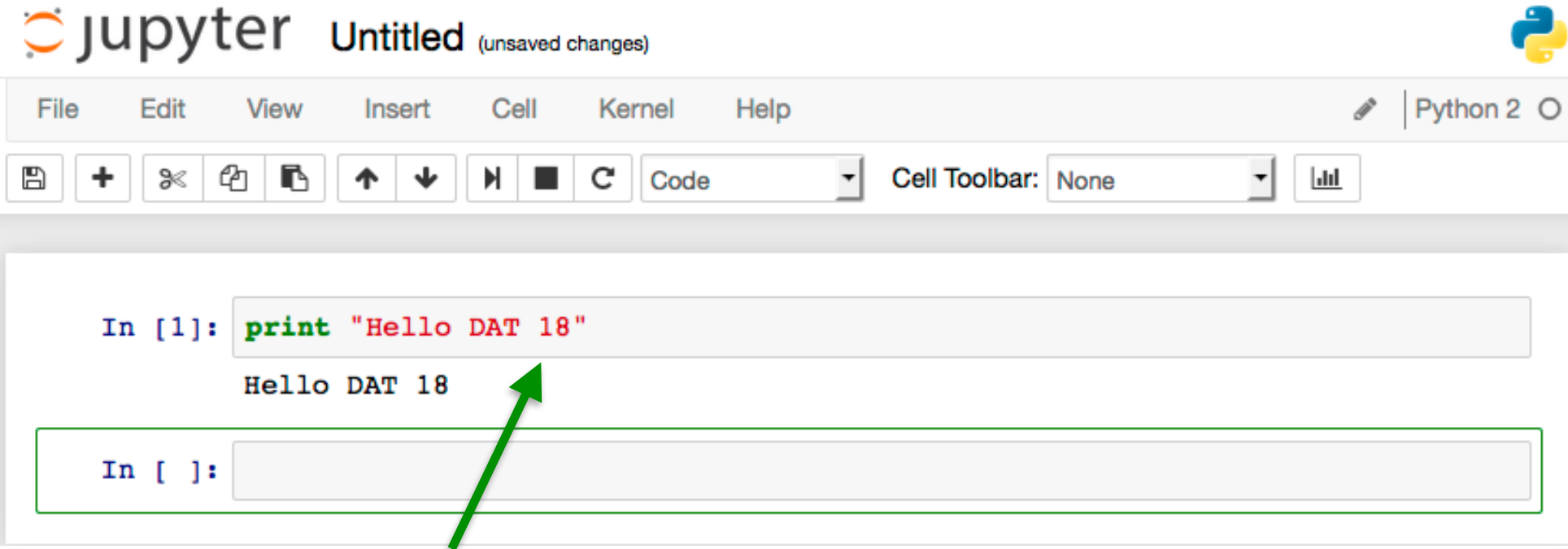
jupyter Untitled (autosaved)

File Edit View Insert Cell Kernel Help Python 2

Save + Copy Paste Up Down Play Stop Refresh Code Cell Toolbar: None

In]:

enter code here



The screenshot shows the Jupyter Notebook interface. At the top, the title bar reads "jupyter Untitled (unsaved changes)" with the Python logo on the right. Below the title bar is a menu bar with "File", "Edit", "View", "Insert", "Cell", "Kernel", and "Help". To the right of the menu bar is a "Python 2" dropdown menu. Below the menu bar is a toolbar with icons for saving, adding, deleting, copying, pasting, undo, redo, and a "Code" dropdown menu. To the right of the toolbar is a "Cell Toolbar" dropdown menu set to "None" and a "Run" button. The main area of the notebook shows a code cell with the input "In [1]: print 'Hello DAT 18'" and the output "Hello DAT 18". Below the code cell is an empty input cell with "In []:". A green arrow points from the text "Shift + Enter runs code and returns results" at the bottom to the "Run" button in the toolbar.

jupyter Untitled (unsaved changes)

File Edit View Insert Cell Kernel Help Python 2

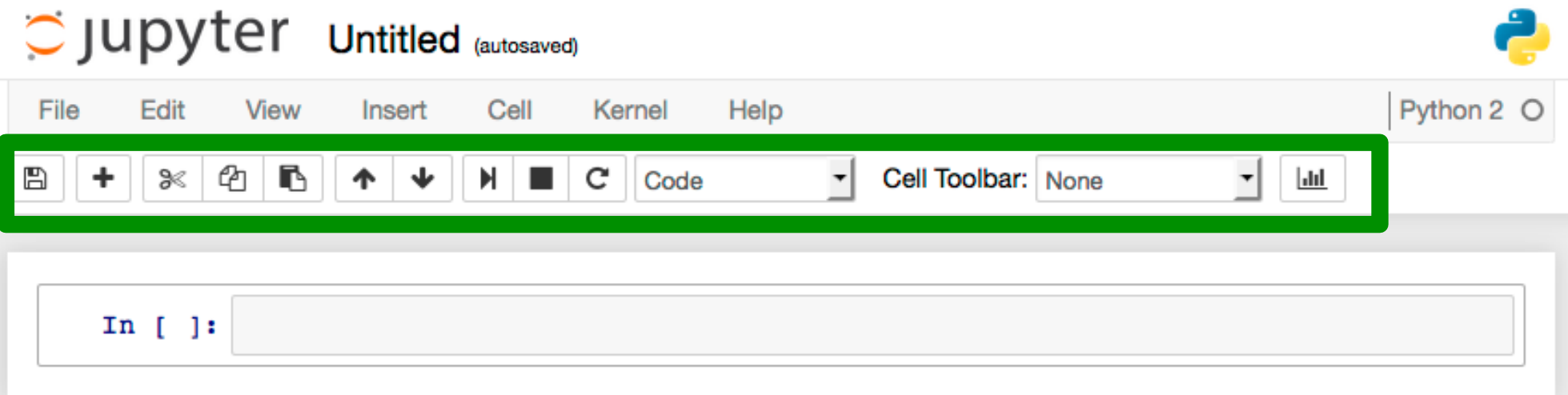
Code Cell Toolbar: None

In [1]: `print "Hello DAT 18"`

Hello DAT 18

In []:

Shift + Enter runs code and returns results



The screenshot displays the Jupyter Notebook interface. At the top, the title bar shows the Jupyter logo, the text "jupyter", and the document name "Untitled (autosaved)". To the right of the title bar is the Python logo. Below the title bar is a menu bar with the following items: File, Edit, View, Insert, Cell, Kernel, and Help. To the right of the menu bar is a dropdown menu showing "Python 2". Below the menu bar is a toolbar, which is highlighted with a green border. The toolbar contains the following icons from left to right: a save icon, a plus icon, a scissors icon, a copy icon, a paste icon, an up arrow icon, a down arrow icon, a play icon, a square icon, a refresh icon, a dropdown menu showing "Code", a dropdown menu showing "Cell Toolbar: None", and a bar chart icon. Below the toolbar is a code input area with the prompt "In []:" followed by a large text input field.

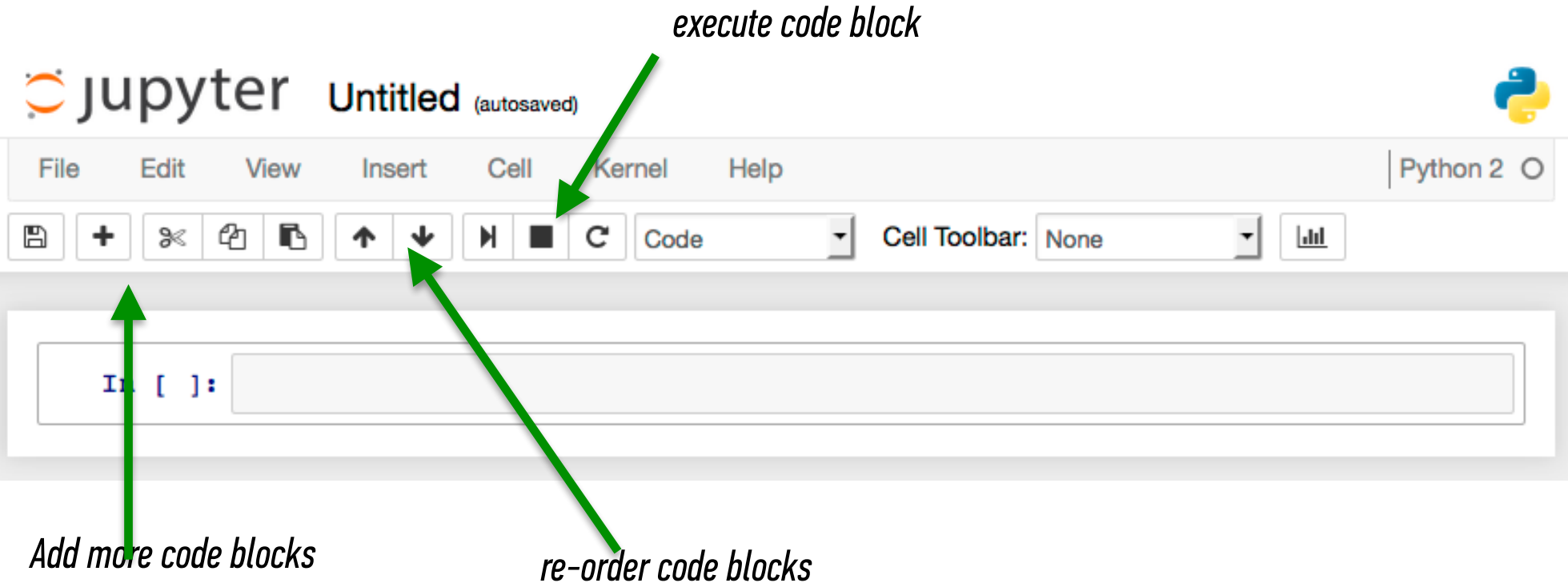
jupyter Untitled (autosaved)

Python 2

File Edit View Insert Cell Kernel Help

Save + Cut Copy Paste Up Down Play Stop Refresh Code Cell Toolbar: None

In []:





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execute code block

Add more code blocks

re-order code blocks

 **jupyter** Untitled (autosaved) 

File Edit View Insert Cell Kernel Help Python 2

Cell Toolbar: None

In [1]: `print "Hello"`
Hello DAT 18

In []:

Run
Run and Select Below
Run and Insert Below
Run All
Run All Above
Run All Below
Cell Type
Current Output
All Output

run multiple cells

jupyter Untitled (autosaved)



File Edit View Insert Cell Kernel Help

Python 2



Cell Toolbar: None



Interrupt

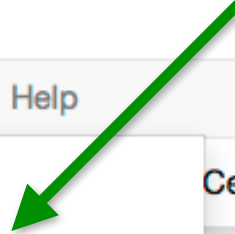
Restart

Reconnect

Change kernel ▶

```
In [1]: print "Hello DAT 18"
Hello DAT 18
```

```
In [ ]:
```

restart kernel

INTRO TO DATA SCIENCE

QUESTIONS?