

Setting Up the Environment



Course Notes

Programming Explained in 5 Minutes

The computer understands 1s and 0s only. To communicate a real-life problem to the computer, you need to create a specific type of text, called a **source code** or a **human readable code**, that software can read and then process to the computer in 1s and 0s.

Term	Definition
program	a sequence of instructions that designate how to execute a computation
programming	taking a task and writing it down in a programming language that the computer can understand and execute

The **Jupyter Notebook App** is a server-client application that allows you to edit your code through a web browser.



Language kernels are programs designed to read and execute code in a specific programming language, like Python, R, or Julia. The Jupyter installation always comes with an installed Python kernel, and the other kernels can be installed additionally.

The **Interfaces**, where you can write code, represent the clients. An example of such a client is the *web browser*.

The Jupyter **server** provides the environment where a *client* is matched with a corresponding *languages kernel*. In our case, we will focus on *Python*, and a *web browser* as a client.

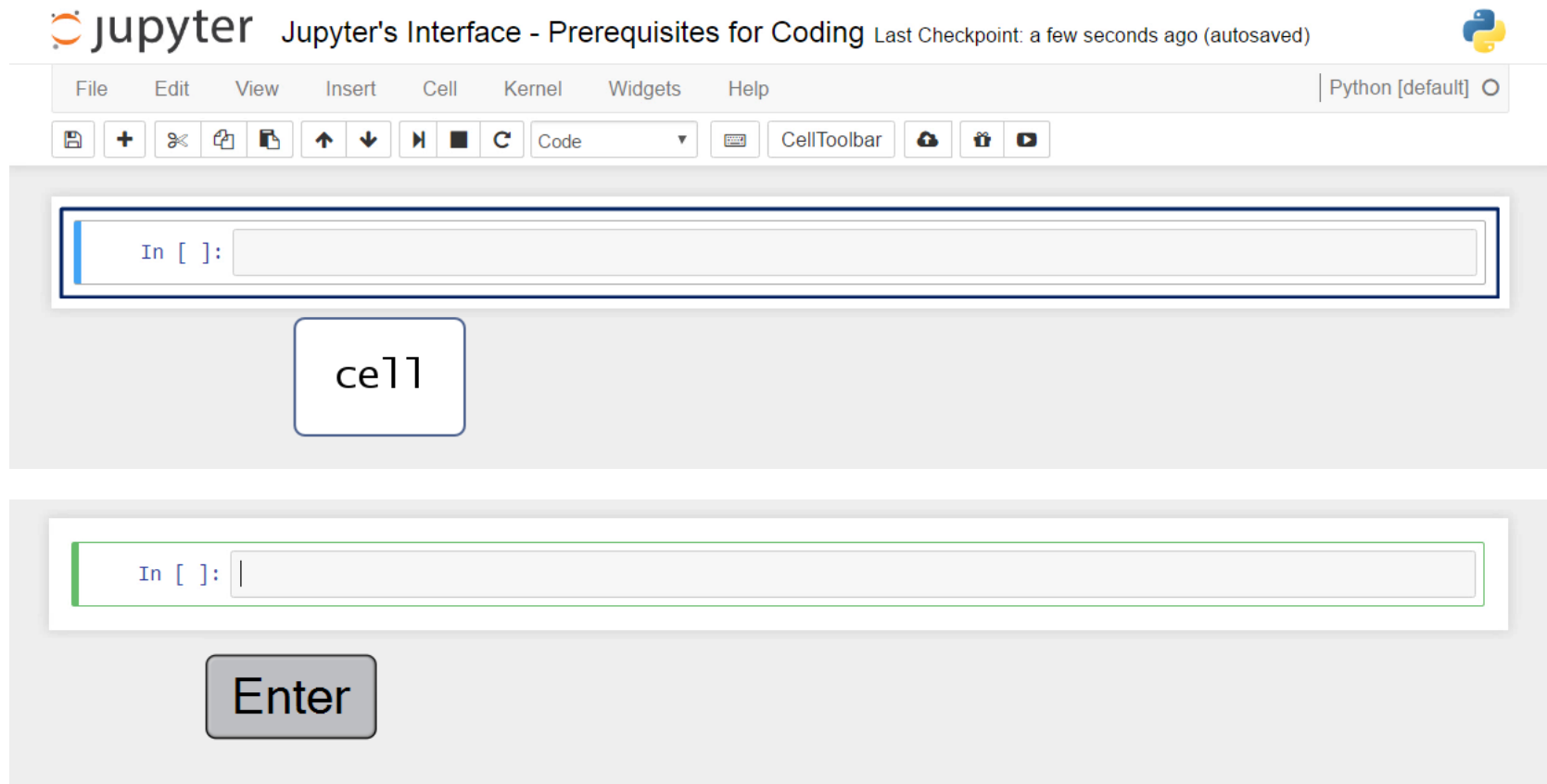
Jupyter's Interface – the Dashboard

As soon as you load the notebook, the **Jupyter dashboard** opens. Each file and directory has a check box next to it. By ticking and unticking an item, you could manipulate the respective object – that means you can duplicate or shutdown a running file.



From the *Upload* button in the top-right corner, you can upload a notebook into the directory you are in. You can expand the *New* button. From the list that falls, you will most likely need to create a new text file, a new folder, or a new notebook file

Jupyter's Interface – Prerequisites for Coding



The screenshot displays the Jupyter web interface. At the top, the Jupyter logo is on the left, the title "Jupyter's Interface - Prerequisites for Coding" is in the center, and the status "Last Checkpoint: a few seconds ago (autosaved)" is on the right. Below the title bar is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. To the right of the menu bar is a language selector showing "Python [default]". Below the menu bar is a toolbar with icons for saving, adding, deleting, copying, pasting, undo, redo, and a dropdown menu currently set to "Code". To the right of the toolbar is a "CellToolbar" button and icons for running, saving, and viewing output. The main area shows a code cell. The top part of the cell is a prompt "In []:" followed by a text input field. The bottom part of the cell is a button labeled "cell". Below the code cell is another input field with the prompt "In []:" and a cursor. Below this field is a button labeled "Enter".

You can access a cell by pressing *Enter*. Once you've done that, you'll be able to see the cursor, so you can start typing code.

Jupyter's Interface – Prerequisites for Coding

```
In [ ]: |
```

input field

```
In [1]: x = [1, 2, 3, 4]  
        x
```

```
Out[1]: [1, 2, 3, 4]
```

output field

Jupyter's Interface – Prerequisites for Coding

```
In [1]: x = [1, 2, 3, 4]  
x
```

```
Out[1]: [1, 2, 3, 4]
```

Ctrl + Enter

You can execute a command in two ways.

The first one is to hold Ctrl and then press Enter. By doing this, the machine will execute the code in the cell, and you will “stay” there, meaning you will not have created or selected another cell.

```
In [2]: x = [1, 2, 3, 4]  
x
```

```
Out[2]: [1, 2, 3, 4]
```

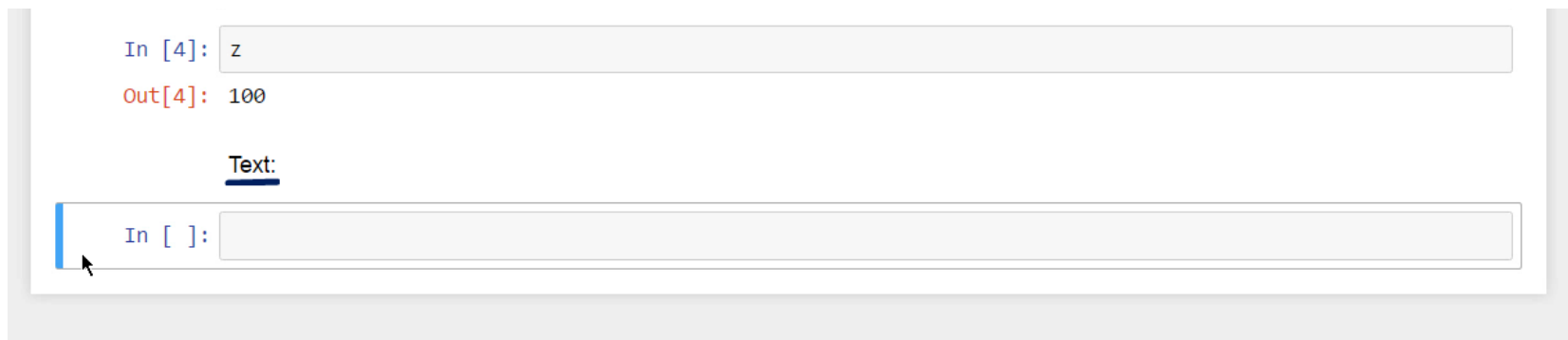
```
In [ ]:
```

Shift + Enter

The second option allows for a more fluid code writing. To execute the same code, hold “Alt” and then press “Enter”. The previous two commands are being executed and then a new cell where you can write code is created.

If you use “Alt” and “Enter” or “Shift” and “Enter”, you can continue typing code easily.

Jupyter's Interface – Prerequisites for Coding



A **markdown cell** is a cell that contains strictly documentation - text not executed as code. It will contain some message you would like to leave to the reader of the file.