SNS COLLEGE OF ENGINEERING

Department of Artificial Intelligence and Data Science

Course Name – Big Data Analytics
III Year / V Semester

Unit 2 – Data Science using Python

Topic 4 - Jupyter

Jupyter

Jupyter Notebook is an open-source, web-based interactive environment, which allows you to create and share documents that contain
- live code,
- mathematical equations,
- graphics,
- maps,
- plots,
- visualizations, and
- narrative text.

- It integrates with many programming languages like Python, PHP, R, C#, etc.

- It was spun off from IPython in 2014 by Fernando Pérez and Brian Granger.
- Project Jupyter's name is a reference to the three core programming languages supported by Jupyter, which are Julia, Python and R, and also a homage to Galileo's notebooks recording the discovery of the moons of Jupiter.

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Dashboard of Jupyter Notebook

It contains 3 tabs namely Files, Running, Clusters

Files Tab

The Files tab is used to display files and folders in the current directory. It also uses an Upload button through which a file can be uploaded to a notebook server.

Running Tab

The Running tab is used to show currently running notebooks.

Cluster Tab

IPython provides the Cluster Tab. IPython is a parallel computing framework, which is an extended version of the IPython kernel.
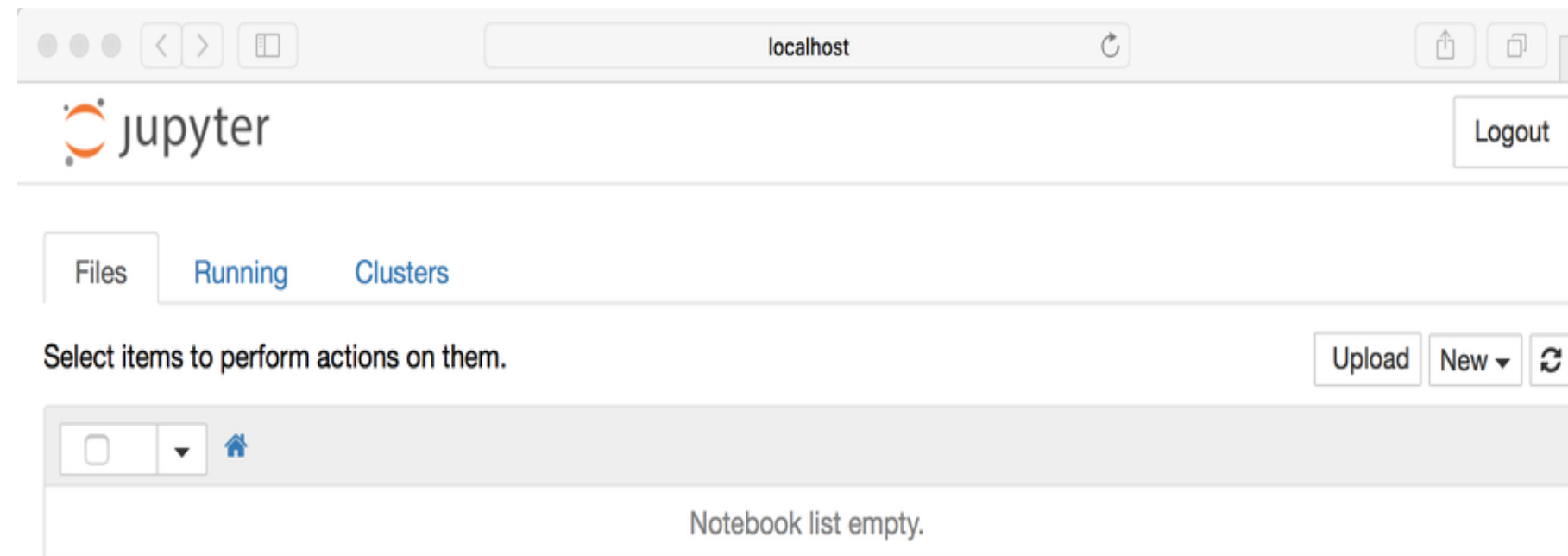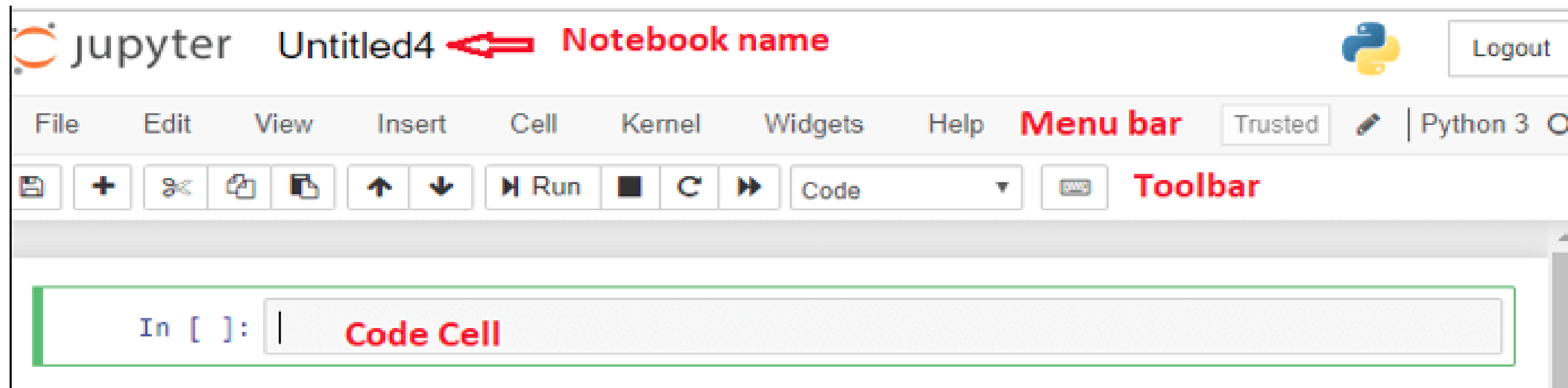
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User interface of Jupyter Notebook

When you create a new notebook, the notebook will be presented with the **notebook name, menu bar, toolbar, and an empty code cell**.

Notebook name: Notebook name is displayed at the top of the page, next to the Jupyter logo.

Menu bar: The menu bar presents different options that are used to manipulate the notebook functions.

Toolbar: The toolbar provides a quick way for performing the most-used operations within the notebook.

Code cell: A code cell allows you to edit and write a new code.

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Components of Jupyter Notebook

There are the following three components of Jupyter Notebook -

The notebook web application: It is an interactive web application for writing and running the code.

The notebook web application allows users to:

•Edit code in the browser with automatic syntax highlighting and indentation.

•Run code on the browser.

•See results of computations with media representations, such as HTML, LaTex, png, pdf, etc.

•Create and use JavaScript widgets.

•Includes mathematical equations using Markdown cells.

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Kernels:

Kernels are the separate processes started by the notebook web application that is used to run a user's code in the given language and return output to the notebook web application.

In Jupyter notebook kernel is available in the following languages:
- Python
- Julia
- Ruby
- R
- Scala
- node.js
- Go

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Notebook documents:

•Notebook document contains a representation of all content which is visible in the notebook web application, including inputs and outputs of the computations, text, mathematical equations, graphs, and images.

Working with cells

•Click on the first cell in the notebook to enter in the edit mode. Now you can write the code in working area.

•After writing the code, you can run it by pressing the Shift+ Enter key or directly click on the run button at the top of the screen.

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Cell Types

There are technically four cell types: Code, Markdown, Raw NBConvert, and Heading.

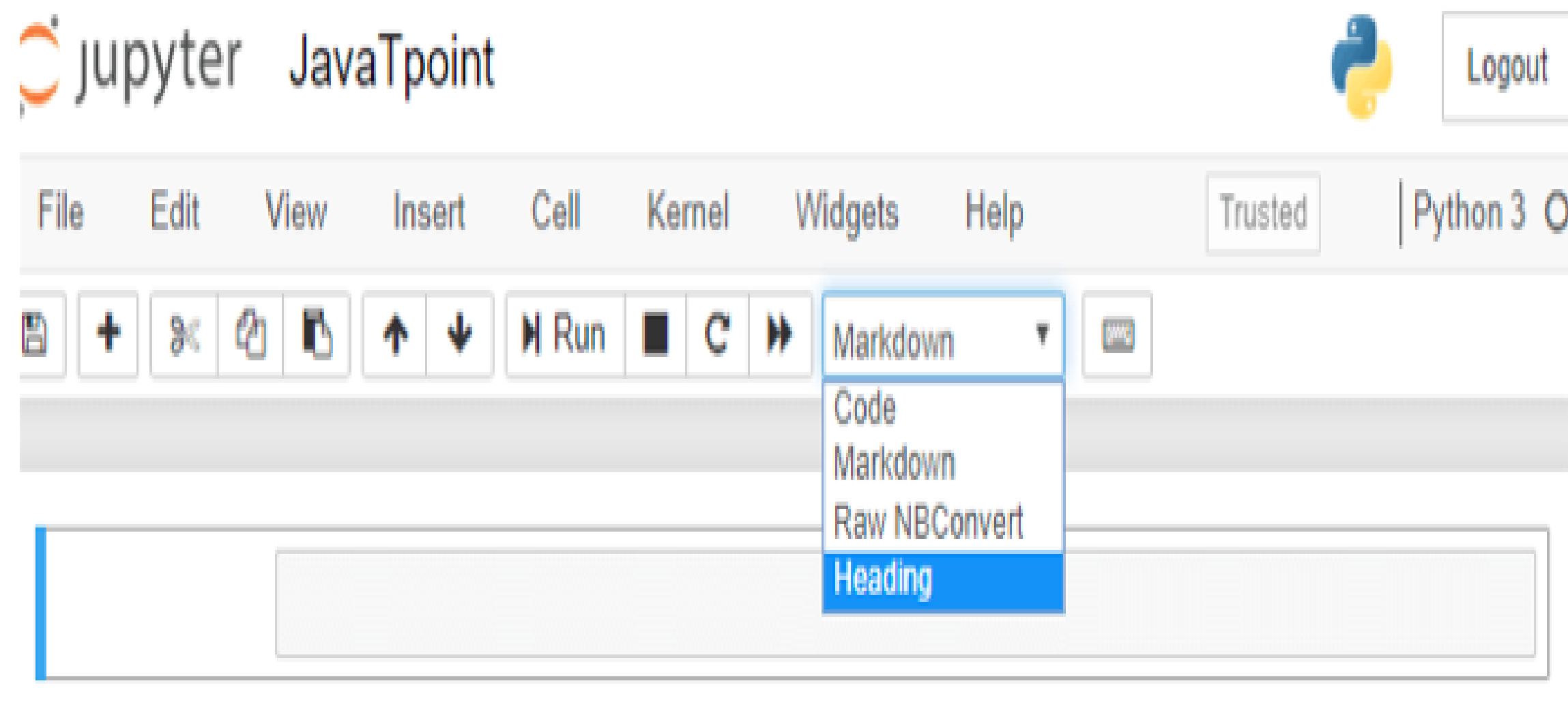**Code Cell**

The contents present in a code cell is treated as statements in a programming language of the current kernel. By default, Jupyter notebook's kernel is in Python so you can write Python statements in a code cell. When you run the statement, its output is displayed below the code. Output can be presented in the form of text, image, matplotlib plots, or HTML tables.

Markdown cell provides documentation to the notebook and makes the notebook more attractive. This cell contains all types of formatting features such as making text bold and italic, headers, displaying ordered or unordered list, Bullet lists, Hyperlinks, tabular contents, images, etc.

The Raw NBConvert cell type is only intended for special use cases when using the nbconvert command line tool. Basically it allows you to control the formatting in a very specific way when converting from a Notebook to another format.

The Heading cell type is no longer supported and will display a dialog that says as much.

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THANK YOU