

#### Consortium





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The European Commission support for the production of this publication does not constitute an endorsement of the contents, which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein. (Project Nº. 2020-1-PT01-KA226-HE-095042).

# What is Jupyter Notebook?

- Jupyter is a collection of standards, a community, and a set of software tools.
- It produces Jupyter notebook: a document that supports mixing executable code, equations, visualizations, and narrative text.
- It is free and open-source tool for interactive and expletory computing.
- There are more than 100 computer languages in Jupyter.
- It is new form of data-based communication.
- Jupyter Notebook can combine explanations traditionally found in textbooks with the interactivity of an application.
- It also have browser-based web application.









#### How we tested it?

- Jupyter Noteebook has been tested by doing in depth desk-based research using resources available on the internet.
- Because of the enough demo and examples, we did not install in this stage of the testing.
- Installation is difficult to preform and requires time and effort.
- Also, the tool is easy to use for students but for teachers it is more demanding. The teacher need to have programming experience.





## Functionalities supporting blended learning

- Supporting Professional Engagement
- Large number of student can used it from different devices.
- Everyone can install it with user level permission.
- Either it can be runned locally or through remote servers. It can be used without download.
- For making local installation, everyone in the class must have enough capacity.
- Jupyter is also cross-platform.







### 2. Supporting Digital Resources

- Jupyter has variety of options are available for distributing course materials and collecting like GitHub and Google Drive.
- Many instructors are using LMS to communicate with students. With LMS instructors can share files and assignments privately.
- Notebooks can be publicly hosted on any websites.
- Jupyter have collaboration with GitHub. GitHub is popular tool for distributing and collecting notebooks.
- JupyterHub is for using notebooks more efficiently.



## 3. Supporting Teaching & Learning

- Jupyter Notebook can be used to organize materials and objects for students, perform living coding, support self paced learning, grade homeworks.
- During classes all notes can be displayed in webpage, so both students and teachers can play with it.
- The entire contents of a notebook is composed of only cells. Everyone can use 'cell' with both text or code.
- Widgets provide the opportunity for learners and instructors to interact with code outputs, such as charts and tables.
- There are hotkeys in cell's like TAB for autocomplete and SHIFT-TAB for full documentation.



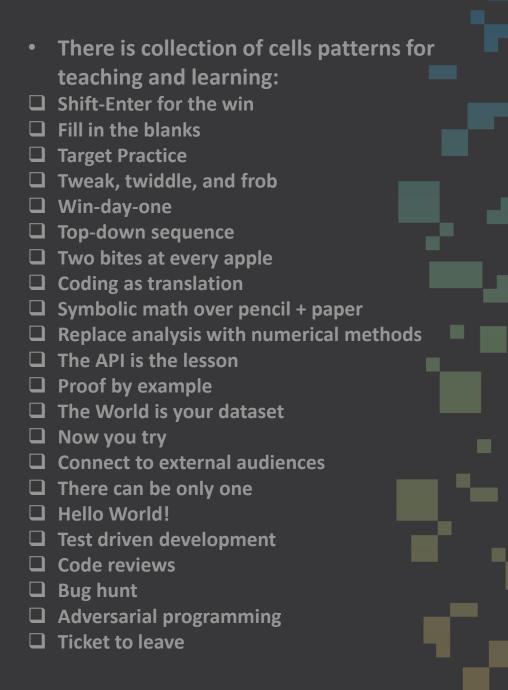


- Magics are meta-commands that only function within Jupyter and allow a user to access language/kernelspecific features.
- They are keeping Jupyter's notebooks under version control.
- It is possible to testing notebooks with restart and run all.
- There are communities which contribute extensions that adding functionality to Jupyter.
- It is easy to convert to other formats from Jupyter Notebook.
- Jupyter allows teachers to conversation between students and data.





<ul> <li>There are many use of Jupyter Notebook. They are:</li> </ul>
□As textbook
☐As workbook
☐As worksheet
☐As notepaper
☐As an app
☐As lab report
☐ As interactive multimedia platform
☐ As a demonstration platform
☐ As a live coding environment







#### 4. Supporting Assesment

- With nbgrader, there will be professional handle and grade of the assessment. It will make creating and grading assessments easier.
- Nbgrader includes 2 tools. One is moving with instructions of assignment and the other one is generating new tab denominated Formgrader in Jupyter Dashboard.
- Main functionalities of supporting assessment are:
  - ☐ Auto grading
  - ☐ Manual grading
  - Validation
  - ☐ Student grades management
  - ☐ Export grades





## 5. Supporting the **Empowerment of Learners**

- Designing interactive seminars is better with Jupyter Notebook.
- There are collaboration with explanatory text, command lines, and plotting. With that collaboration, students can use this environment without needing to understand all its technicalities.
- Different levels of complexity can be considered depending on the teaching needs and the student's motivation.
- Jupyter is also helping to improve effective communication skills.
- Self-learning is encouraged in different levels.
- Marking and automatic marking can be done remotely in a more flexible manner



## 6. Facilitating Learners' Digital Competence

- With Jupyter Notebook rich learning experiences can be created that link together the core foundations of computational thinking.
  - Decomposition: Breaking down data, processes, or problems into smaller, manageable parts
  - ☐ Pattern Recognition: Observing patterns, trends, and regularities in data
  - Abstraction: Identifying the general principles Algorithm Design:
    Developing the step-by-step instructions
- Also, it encourages teaching or strengthening programming skills, by combining code with text descriptions and visualizations.



- The Jupyter system supports over 100 programming languages and that ensures to learn a free, flexible and easily sharable and exportable software.
- Using LaTeX is beneficial for elaborating scientific documents or even printed materials.
- Jupyter Notebook have improved active acquisition of numerical calculation abilities.
- Integrating notebooks into classes also exposes students to a large and growing ecosystem of open-source tools.
- The total computing power for the class scales with the number of students.
- All students must have enough CPU power and memory to support the intended applications.







