

Powerpoint tutorial

Evaluation of Jupyter Notebook



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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 exploratory 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 Notebook 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

1. 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/kernel-specific 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.



- There are many use of Jupyter Notebook. They are:

- ☐ 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

- There is collection of cells patterns for teaching and learning:

- ☐ Shift-Enter for the win
- ☐ Fill in the blanks
- ☐ Target Practice
- ☐ Tweak, twiddle, and frob
- ☐ Win-day-one
- ☐ Top-down sequence
- ☐ Two bites at every apple
- ☐ Coding as translation
- ☐ Symbolic math over pencil + paper
- ☐ Replace analysis with numerical methods
- ☐ The API is the lesson
- ☐ Proof by example
- ☐ The World is your dataset
- ☐ Now you try
- ☐ Connect to external audiences
- ☐ There can be only one
- ☐ Hello World!
- ☐ Test driven development
- ☐ Code reviews
- ☐ Bug hunt
- ☐ Adversarial programming
- ☐ Ticket to leave



4. Supporting Assessment

- 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.





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