CS506 Programming for Computing

HOS06A– Set Up Jupyter Notebooks

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Before You Start

- Version numbers may not match the most current version at the time of writing. If given the option to choose between the stable release (long-term support) or the most recent, please select the stable release rather than the beta-testing version.
- There might be subtle discrepancies along with the steps. Please use your best judgment while going through this cookbook-style tutorial to complete each step.
- For your working directory, use your course number. This tutorial may use a different course number as an example.
- All the steps and concepts in this tutorial are from the textbook, so if you encounter problems in this tutorial, please try to read and compare the textbook to solve the problem. If you still can't solve the problem, please feel free to contact your course TA.
- Avoid copy-pasting code from the book or the GitHub repository. Instead, type out the code yourself. Resort to copy-pasting only when you are stuck and find that things are not working as expected.

Learning Outcomes

- Installing Jupyter Extension
- Run a simple program in notebooks

Resources

- Jupyter Project Documentation: https://docs.jupyter.org/en/latest/#jupyter-project-documentation
- Jupyter in VScode: https://code.visualstudio.com/docs/datascience/jupyter-notebooks
- Jupyter with pip: https://jupyter.org/install
- JUPYTER NOTEBOOK CHEAT SHEET: https://www.edureka.co/blog/wp-content/uploads/2018/10/Jupyter_Notebook_CheatSheet_Edureka.pdf

Section 1 - Jupyter Notebook

1) Jupyter is an interactive computing environment that enables users to author notebook documents that include:

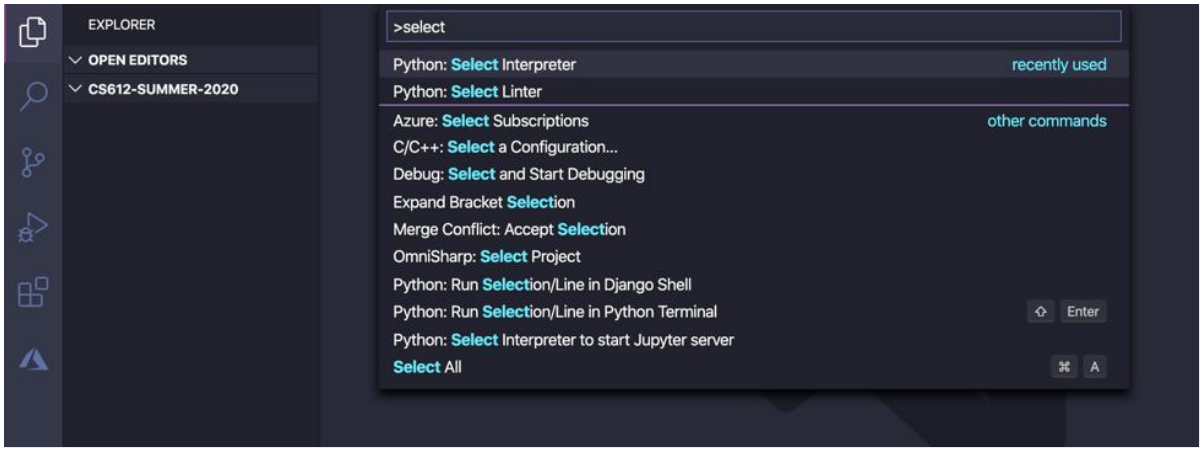
    a) - Live code
    b) - Interactive widgets
    c) - Plots
    d) - Narrative text
    e) - Equations
    f) - Images
    g) - Video.

Visual Studio Code supports working with Jupyter Notebooks natively, as well as through Python code files.

2) **Set up environment (2 Methods)**

NOTE: The path and/or folder names in the screenshots might be different from yours

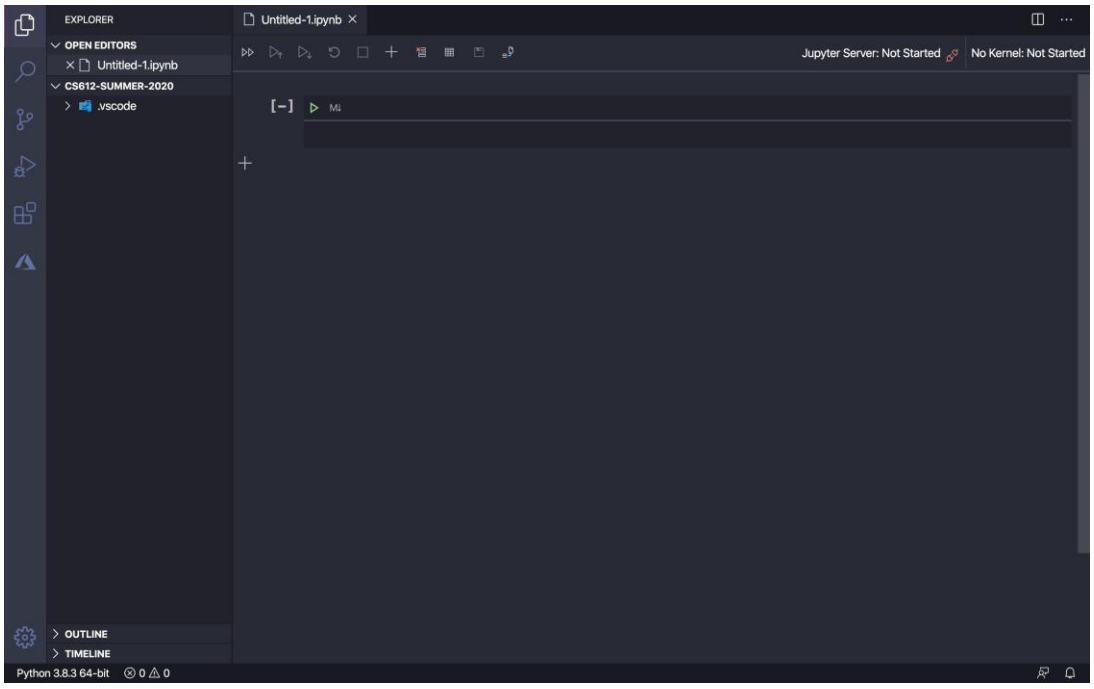
3) In Visual Studio Code, open the HOS06 assignment.
4) To select an environment, use the Python: Select Interpreter command from the Command Palette (Press Ctrl+Shift+P to bring up a command palette, then type "select" to narrow down the list and then select Python: Select Interpreter)



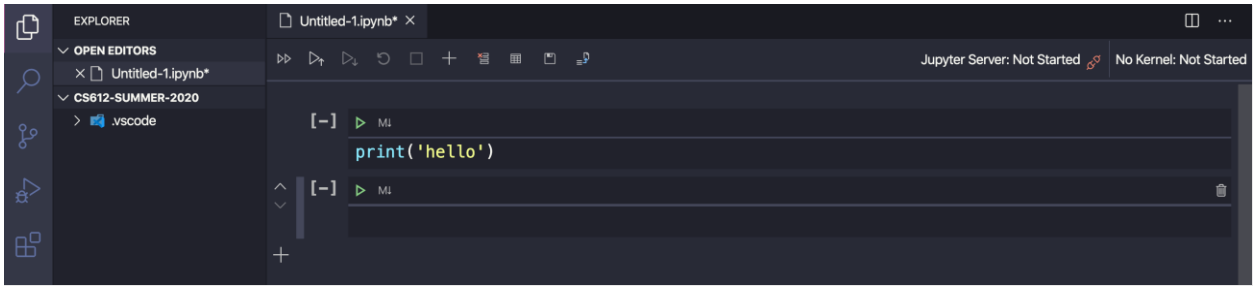
5) Choose any Python version you would like to use. (In this case, version 3.8.3 is used)

6) Once the appropriate environment is activated, you can create and open a Jupyter Notebook, connect to a remote Jupyter server for running code cells, and export a Jupyter Notebook as a Python files.

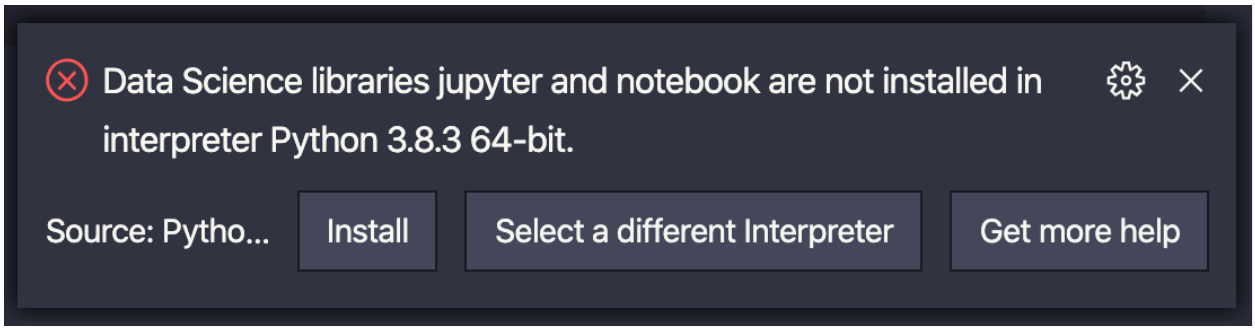
7) Press Ctrl+Shift+P to select a command palette again, then type “create” to bring up Python: Create New Blank Jupyter Notebook and select it from the dropdown. You will see a similar screen like the image below.



8) Type print(‘hello’) into the Jupyter like the following



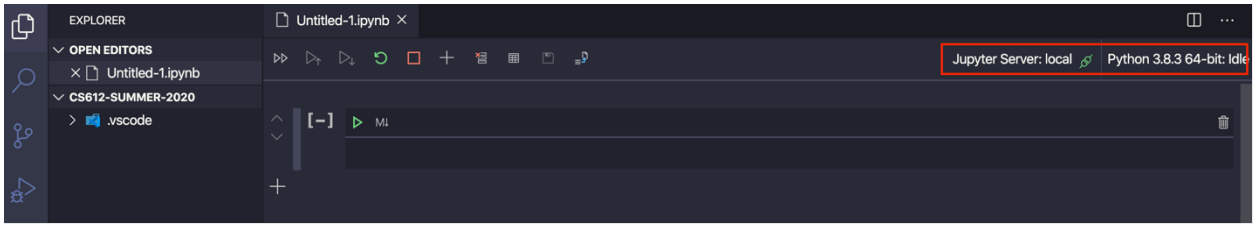
9) Click the run button and you will get an error that says; click install.



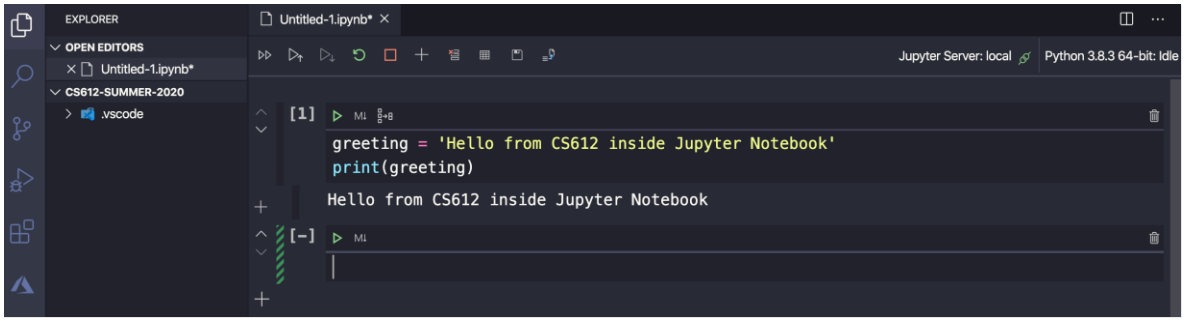
10) if you see another error saying "Data Science library ipykernel is not installed. Install?", select "Yes" prompt.

11) Restart VS Code by pressing using command palette, then type in “reload” to select Reload Window

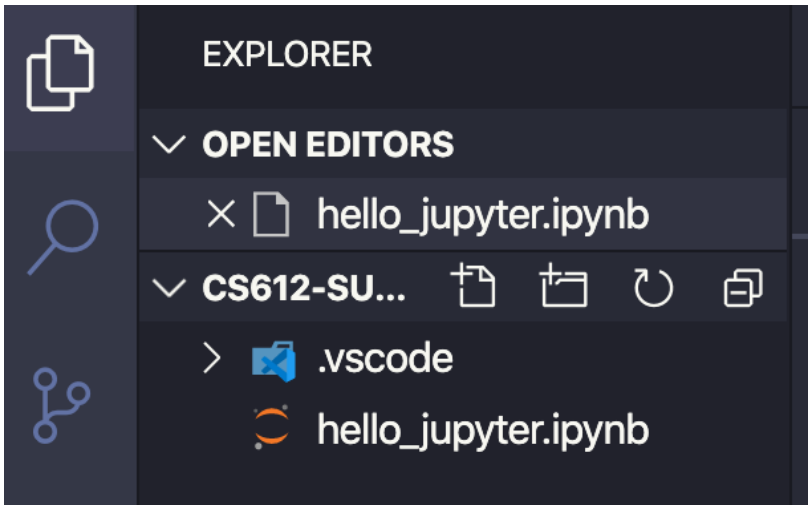
12) Try Step 4 again to see if jupyter was installed correctly. You should see that Jupyter Server has been connected like the screenshot below.



13) Type the following in the code cell and hit the green run button, it should print out the message just below the code cell.



14) Now, save it with the name "hello_jupyter.ipynb" under new folder name "Module 6" (for example: CS506/Module 6).



*Notice the file you saved will have an extension *.ipynb*

15) Pip - You can also install Jupyter using pip by typing the following commands in terminal:

```
1. python -m pip install --upgrade pip
2. python -m pip install jupyter
```

3. Restart VS Code
4. Pick the Python environment you did the pip install in
5. Then, create a Jupyter Notebook

16) Save your Jupyter Notebook with all Output

Tips and Tricks

1. Use the command palette: **Cmd + Shift + P (Ctrl + Shift + P on Windows)**

2. To move from edit mode to command mode, press the **ESC** key. To move from command mode to edit mode, press the **Enter** key.
3. In command mode, press **A** to add cell above, **B** add cell below.
4. Select a cell, up/down arrow keys
5. Run code cell:
    - **Ctrl+Enter** runs the currently selected cell.
    - **Shift+Enter** runs the currently selected cell and inserts a new cell immediately below (focus moves to new cell).
    - **Alt+Enter** runs the currently selected cell and inserts a new cell immediately below (focus remains on current cell).
6. Delete a cell, press **dd** while in command mode.
7. Switching between Markdown and code cell, **M** and **Y** respectively.
8. Enable line number, press **L** while in command mode.