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Jupyter Notebooks

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Jupyter notebooks

- Jupyter notebooks are interactive documents that contain live code, equations, visualisations, and narrative text
  - They are a popular tool for data science, machine learning, and scientific computing
- Jupyter notebooks can be used to create and share documents, collaborate on projects, and teach and learn

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Why use Jupyter notebooks?

- Jupyter notebooks have a number of advantages over other programming environments, including:
  - Interactivity: Jupyter notebooks allow you to run code and see the results immediately. This makes them ideal for exploratory programming and debugging
  - Rich text support: Jupyter notebooks support markdown formatting, which allows you to add text, images, and equations to your code cells. This makes it easy to create and share computational narratives
  - Collaboration: Jupyter notebooks can be easily shared with others, making them ideal for collaboration on projects
  - Language agnostic: Jupyter notebooks support a wide range of programming languages, including Python, R, Julia, and JavaScript

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How to use Jupyter notebooks

- To use Jupyter notebooks, you will need to install the Jupyter Notebook software.
  - This is available for free for all major operating systems
  - Once you have installed Jupyter Notebook, you can create a new notebook by typing jupyter notebook in a terminal window.
- Jupyter notebooks are divided into cells.
  - Each cell can contain either code or text. To create a new code cell, click the "+" button in the toolbar and select "Code".
  - To create a new text cell, click the "+" button and select "Markdown".
  - To run a code cell, click the "Run" button in the toolbar.
    - The output of the code will be displayed below the cell.
- You can add text, images, and equations to your code cells using markdown formatting.
  - To learn more about markdown, see the markdown documentation: https://www.markdownguide.org/

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Markdown

Basic Syntax

These are the elements outlined in John Gruber's original design document. All Markdown applications support these elements.

Element	Markdown Syntax

Heading	`# H1`
	`## H2`
	`### H3`

Bold	`**bold text**`
Italic	`*italicized text*`
Blockquote	`> blockquote`

Ordered List	`1. First item`
	`2. Second item`
	`3. Third item`

Unordered List	`- First item`
	`- Second item`
	`- Third item`

Code	`` `code` ``
Horizontal Rule	`---`
Link	`[title](https://www.example.com)`
Image	`![alt text](image.jpg)`

https://www.markdownguide.org/cheat-sheet/

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Extended Syntax

These elements extend the basic syntax by adding additional features. Not all Markdown applications support these elements.

Element	Markdown Syntax

Table	`| Syntax | Description |`
	`| ---------- | ---------- |`
	`| Header | Title |`
	`| Paragraph | Text |`

Fenced Code Block	```` ```
	{
	  "firstName": "John",
	  "lastName": "Smith",
	  "age": 25
	}
	``` ````

Footnote	`Here's a sentence with a footnote. [^1]`
	
	`[^1]: This is the footnote.`

Heading ID	`### My Great Heading {#custom-id}`
Definition List	`term` `: definition`
Strikethrough	`~~The world is flat.~~`
Task List	`- [x] Write the press release` `- [ ] Update the website`

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Editing

jupyter my _first_botebook Last Checkpoint: 1 minute ago

File Edit View Run Kernel Settings Help

Code

```
# This is my new notebook
## let's see how it works
Honestly, you should really pay attention now!
```

[1]:
```
x= 3
print(x)
```

```
3
```

[2]:
```
def my_function(parameter=4):
    return parameter*44

my_function(1234)
```

[2]:
```
54296
```

[ ]:

[ ]:

[ ]:

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Running

jupyter my _first_botebook Last Checkpoint: 1 minute ago

File Edit View Run Kernel Settings Help

Code

This is my new notebook

let's see how it works

Honestly, you should really pay attention now!

[1]:
```
x= 3
print(x)
```

```
3
```

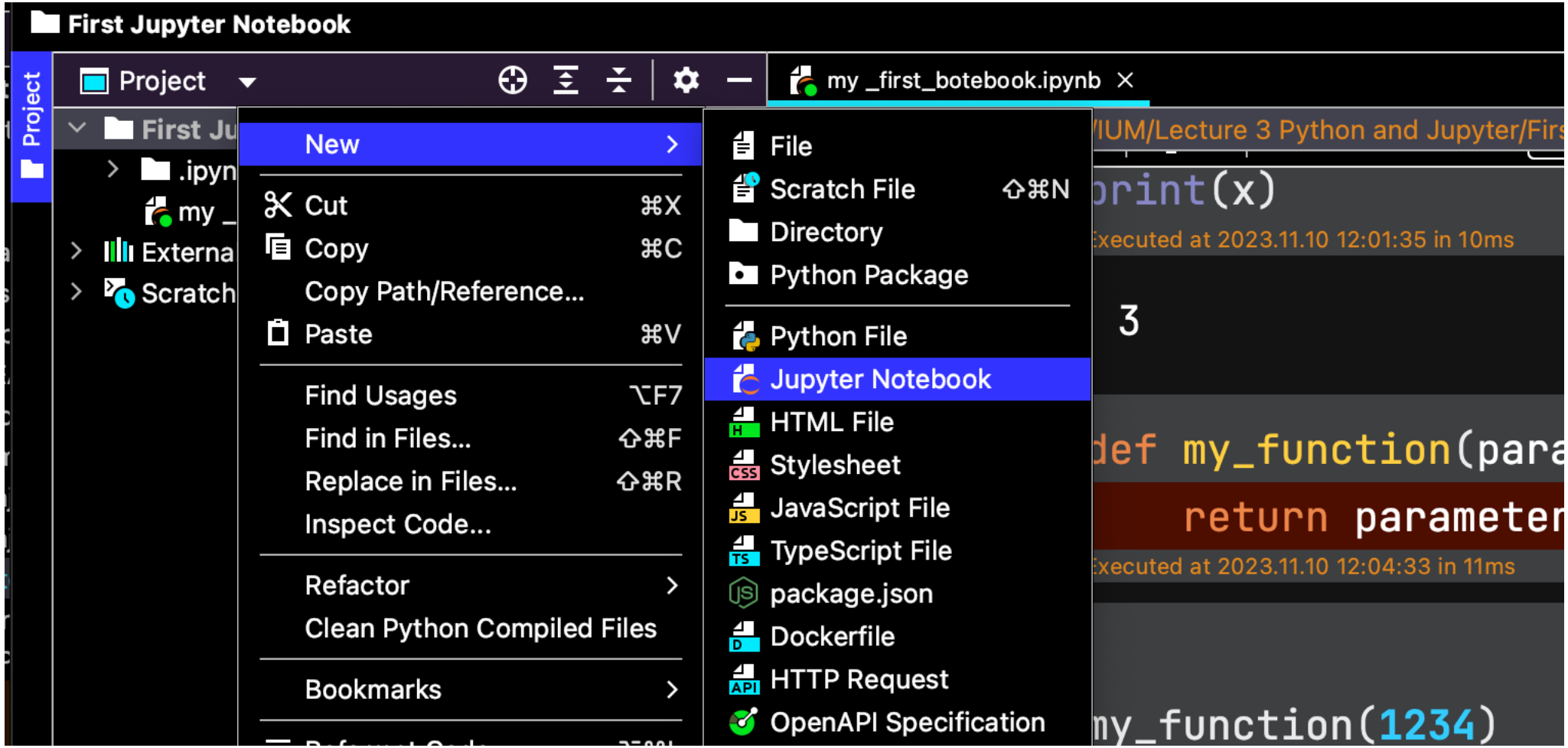
[2]:
```
def my_function(parameter=4):
    return parameter*44

my_function(1234)
```

[2]:
```
54296
```

[ ]:

We will use PyCharm

- So to Allow debugging



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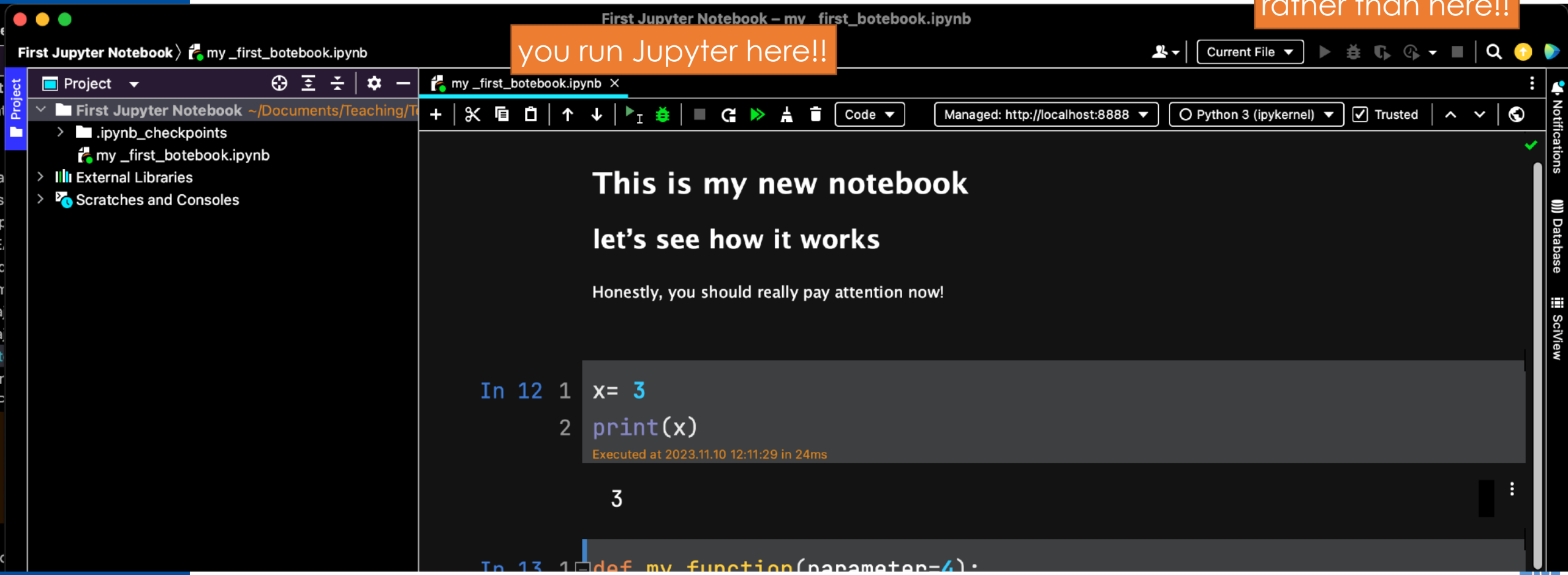

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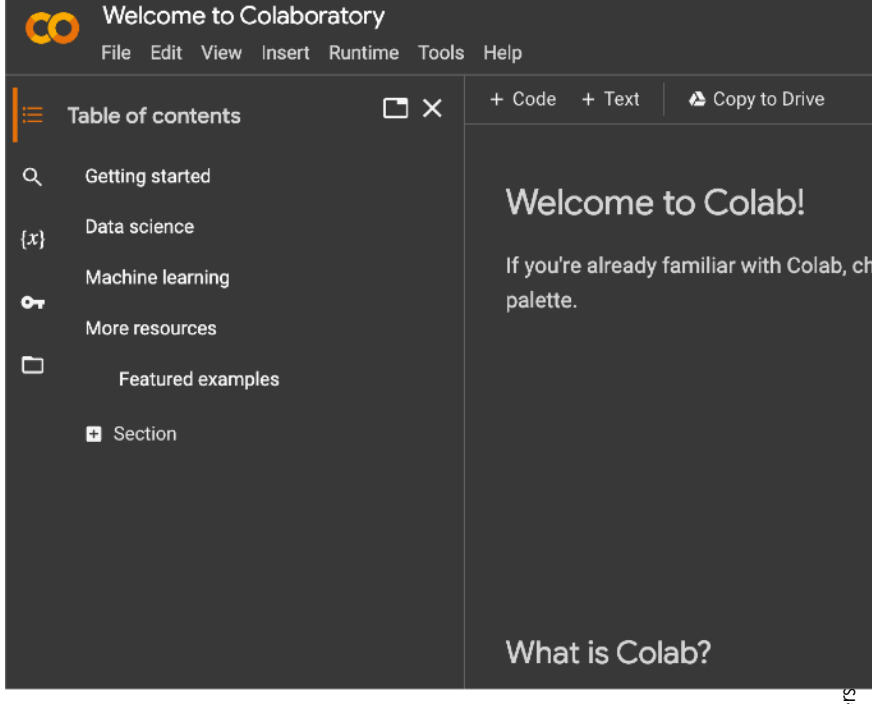
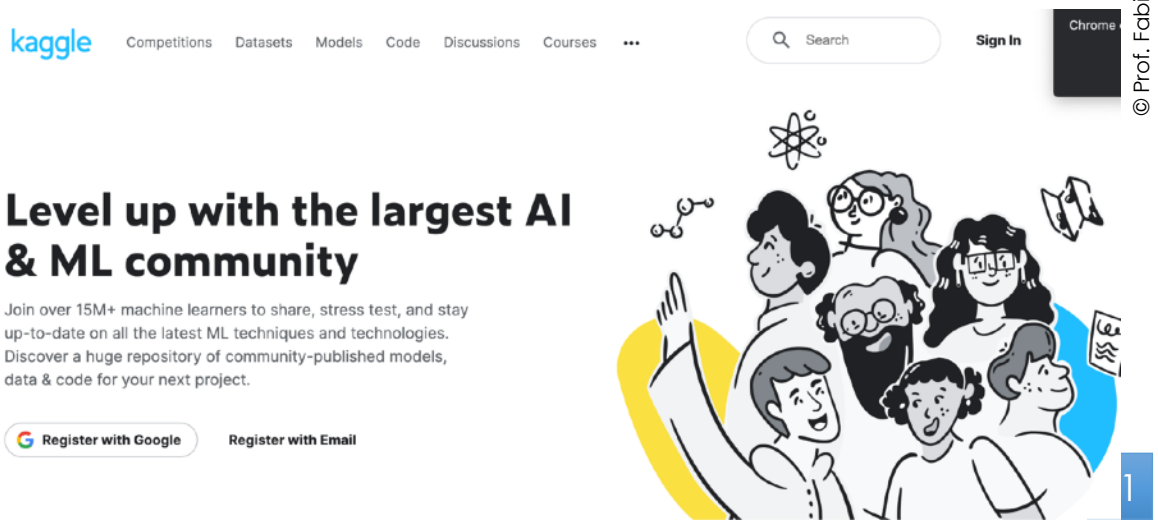
Other tools

- Google Colab
  - pretty standard in development of AI
  - quite powerful machines available
  - https://colab.research.google.com/
- Kaggle
  - advantage: lots of available data repositories that you can use directly
  - https://www.kaggle.com/





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