

Artificial Intelligence

Assignment 0

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Assignment Objective

- Part 0 Requirements
- Part 1 Local & Colab Setup
- Part 2 Python Basics
 - Basic data types (Containers, Lists, Dictionaries, Sets, Tuples)
 - Functions, Classes
- Part 3 Numpy and Matplotlib
 - Arrays, Array indexing, Broadcasting, Plotting
- Part 4 PyTorch Tutorial
 - Problem: Implementing training/ testing codes for PyTorch model

How to install assignment files

- Assignment files
 - env/
 - Assignmentto-1_Python_Basics.ipynb
 - Assignmentto-2_Numpy_Matplotlib.ipynb
 - Assignmentto-3_PyTorch_Tutorial.ipynb
 - CollectSubmission.sh
- Install assignment files
 - Please extract the downloaded file.

Pre-announcement

```
M2177.003100 Deep Learning Assignment 0
Part 3. PyTorch Tutorial

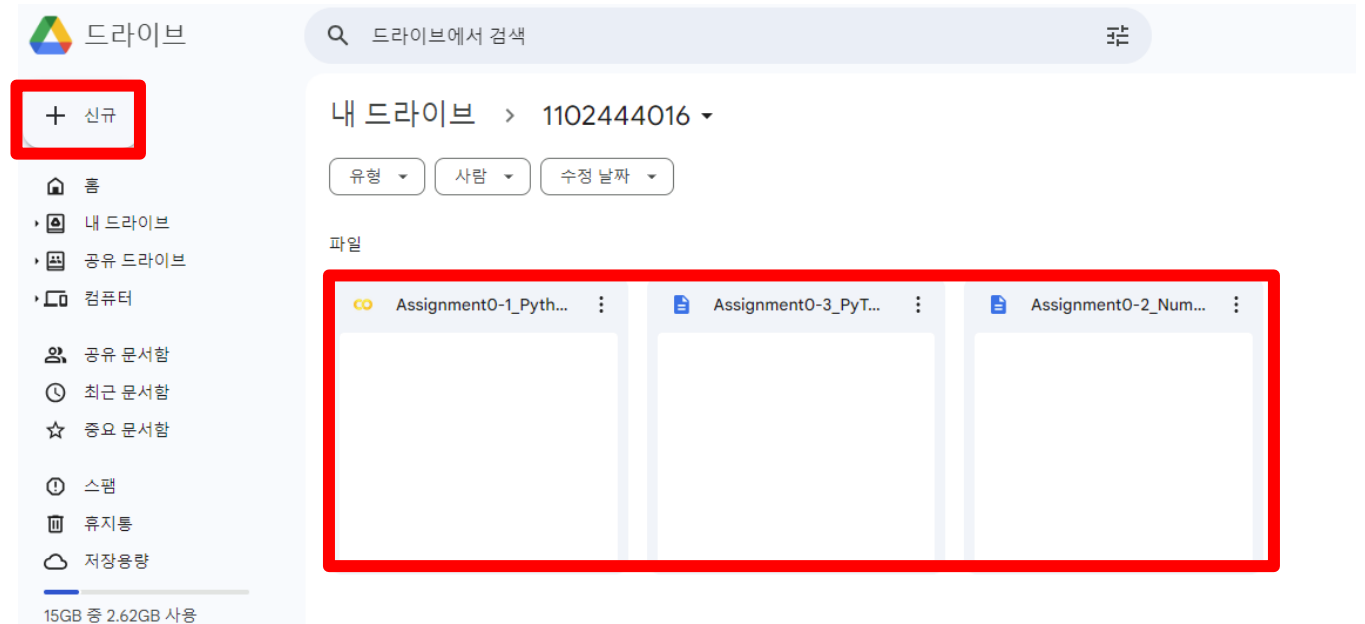
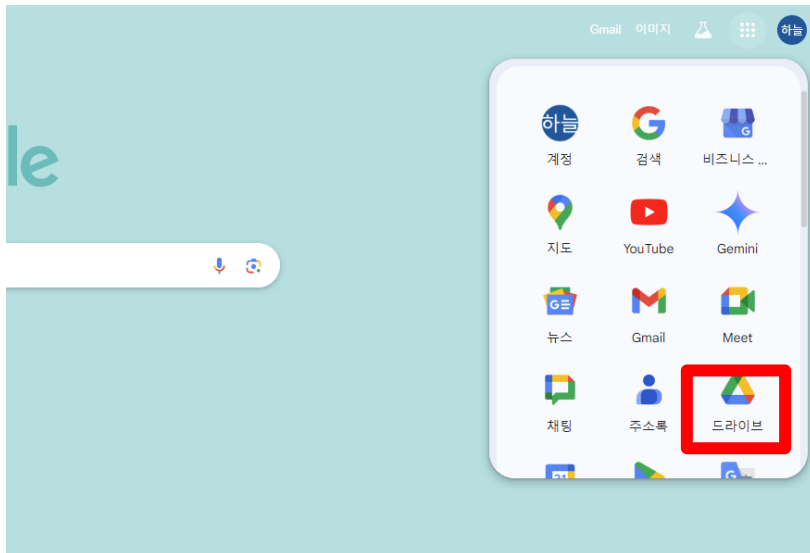
# only colab user!
!pip uninstall torch -y
!pip install torch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0

import torch
print(torch.__version__)
```

- Only Google Colab users should run this section. Local users can either delete or comment it out.

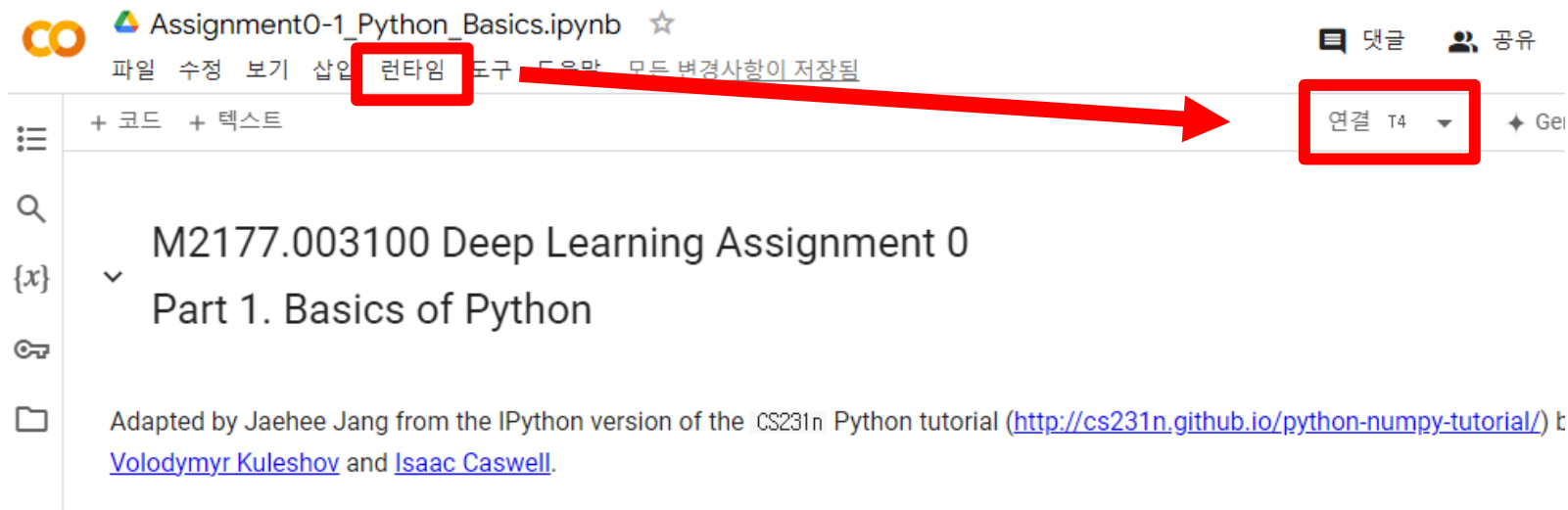
Colab Setup

- Step 1 Access Google Drive and create a folder.
 - Folder name : (student_id)_(subject)
 - Ex) 1102444016
- Step 2 Upload ONLY .ipynb files to the created folder.



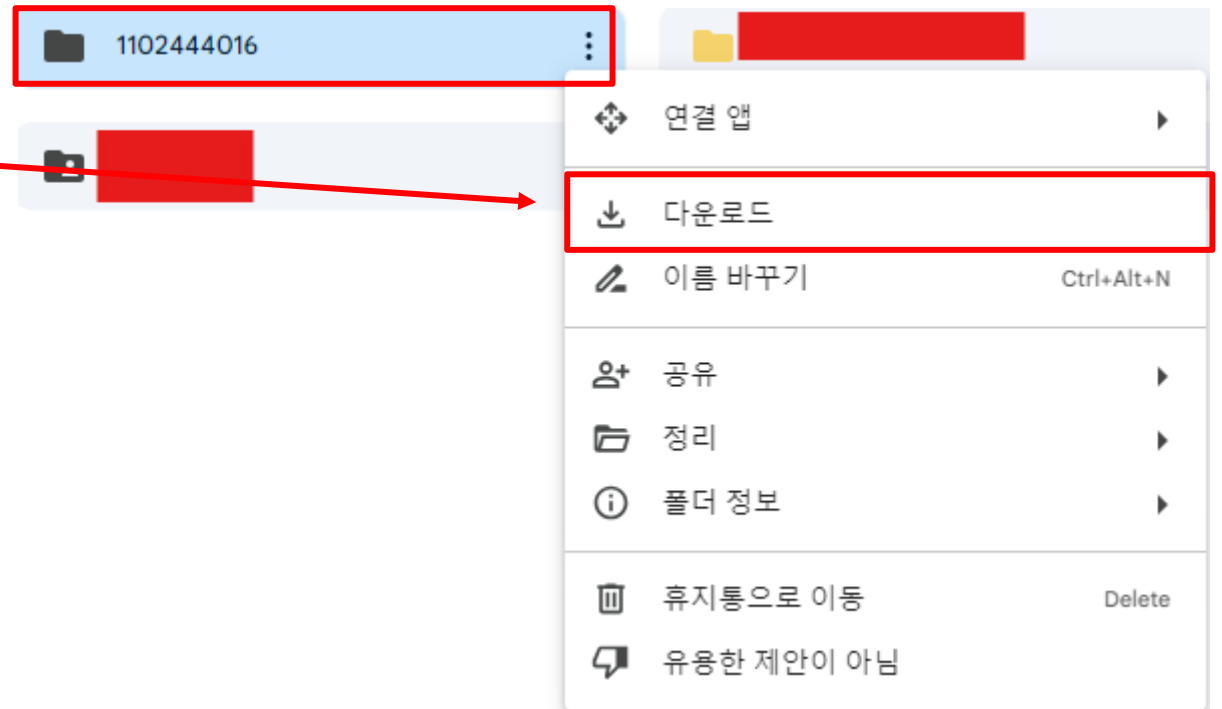
Colab Setup

- Step 1: Runtime > Change runtime type
 - Change the hardware accelerator to T4.
- Step 2: verify that the changes have been made as shown in the red box(T4)
 - You can now use it like a regular Jupyter Notebook.
- Please make sure to save your changes.



Colab Setup

- Submitting your work(Colab)
 - Go into the Google Drive folder you created earlier.
 - Folder name : student-id
 - Download
 - Upload the downloaded zip file on LMS.
 - DO NOT clear the final outputs



Local setup

- Step 1 Anaconda Download

- <https://www.anaconda.com/download/success> (download)

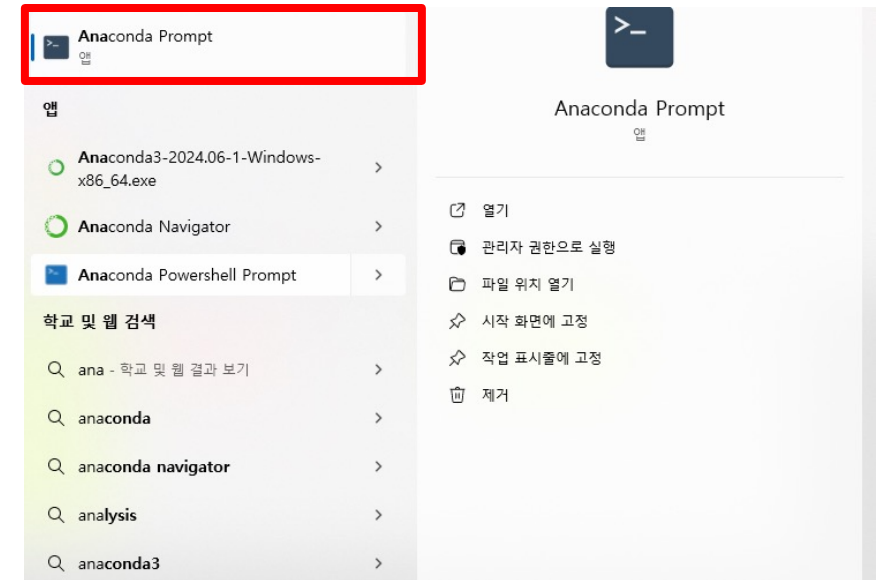
- Step 2 Join to Anaconda prompt and activate AI-24

- 1. conda env create -f environment.yml(Use the cd command to navigate to the env folder and then run this command.)

```
(base) C:\Users\ssu_hai\Desktop\인공지능\Assignment0>cd env  
(base) C:\Users\ssu_hai\Desktop\인공지능\Assignment0\env>conda env create -f environment.yml
```

- 2. conda activate AI-24

```
(base) C:\Users\ssu_hai>conda activate AI-24  
(AI-24) C:\Users\ssu_hai>
```



Local setup

- Step 3 Verification of activation

The screenshot displays the JupyterLab interface. On the left, a 'Select Kernel' dialog box is open, with a red circle '2' highlighting the 'Python Environments...' option. In the top right corner of the JupyterLab window, a red circle '1' highlights the 'Select Kernel' button. The main editor area shows a Python notebook titled 'Assignment0-1_Python_Basics.ipynb'. A red circle '3' highlights the kernel name 'AI-24 (Python 3.10.12)' in the top right corner of the notebook. The notebook contains the following code:

```
if loud:
    print(f'HELLO, {self.name.upper()}!')
else:
    print(f'Hello, {self.name}')

g = Greeter('Fred') # Construct an instance of the Greeter class
g.greet()            # Call an instance method; prints "Hello, Fred"
g.greet(loud=True)   # Call an instance method; prints "HELLO, FRED!"
```

The output of the code is shown below the code cells:

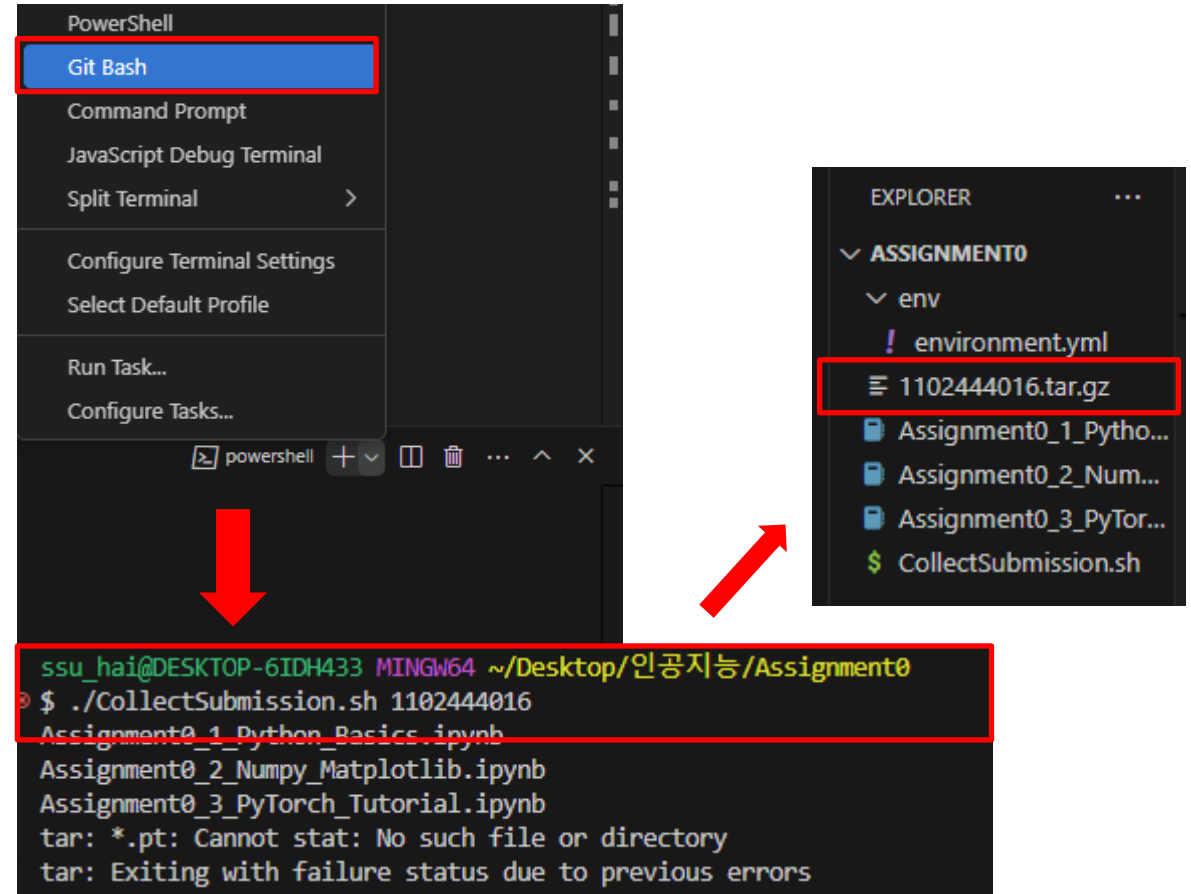
```
[63] ... Hello, Fred
      HELLO, FRED!
```

- Once steps 1 to 3 are completed, you can run the code!

Local setup

- Submitting your work

- After you are done
 - Open Git Bash in VSCode or download it locally.
 - \$./CollectSubmission.sh 1102444016 (student-id)
 - Upload the (student-id).tar.gz on LMS
- DO NOT clear the final outputs



Output Examples

- ###TO DO### is only in Assignmento-3_PyTorch_Tutorial.ipynb

```
Train Epoch: 9 [00000/60000 (0%)] Loss: 0.291984
Train Epoch: 9 [06400/60000 (11%)] Loss: 0.291847
Train Epoch: 9 [12800/60000 (21%)] Loss: 0.277419
Train Epoch: 9 [19200/60000 (32%)] Loss: 0.361615
Train Epoch: 9 [25600/60000 (43%)] Loss: 0.284308
Train Epoch: 9 [32000/60000 (53%)] Loss: 0.187955
Train Epoch: 9 [38400/60000 (64%)] Loss: 0.320377
Train Epoch: 9 [44800/60000 (75%)] Loss: 0.405238
Train Epoch: 9 [51200/60000 (85%)] Loss: 0.279186
Train Epoch: 9 [57600/60000 (96%)] Loss: 0.162448
Train Epoch: 10 [00000/60000 (0%)] Loss: 0.296218
Train Epoch: 10 [06400/60000 (11%)] Loss: 0.380556
Train Epoch: 10 [12800/60000 (21%)] Loss: 0.293848
Train Epoch: 10 [19200/60000 (32%)] Loss: 0.253909
Train Epoch: 10 [25600/60000 (43%)] Loss: 0.397972
Train Epoch: 10 [32000/60000 (53%)] Loss: 0.228490
Train Epoch: 10 [38400/60000 (64%)] Loss: 0.326564
Train Epoch: 10 [44800/60000 (75%)] Loss: 0.237349
Train Epoch: 10 [51200/60000 (85%)] Loss: 0.334854
Train Epoch: 10 [57600/60000 (96%)] Loss: 0.227650

Test set: Average loss: 0.2893, Accuracy: 9193/10000 (91.93%)
```

Important Notes

- Please read the notes on the notebooks carefully
- Googling first before mailing TAs
- TA email: 1102444016@soongsil.ac.kr

