Robot Sensor Data Processing

Lab 1. Environment Setting (google colab)

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소프트웨어융합학과

Google colaboratory

- It's combination of Jupyter notebook and Google Drive
- Pre-installed libraries : Tensorflow, Scikit-learn, Matpoltilb and so on
- Runs entirely in the cloud as docker
- Python 2.7 & Python 3.6 support
- Free GPU acceleration
- Support bash commands
- Collaboration features

- The maximum session maintain time is 12 hours
- Also, it will end session if you stay inactively more than 90 minutes
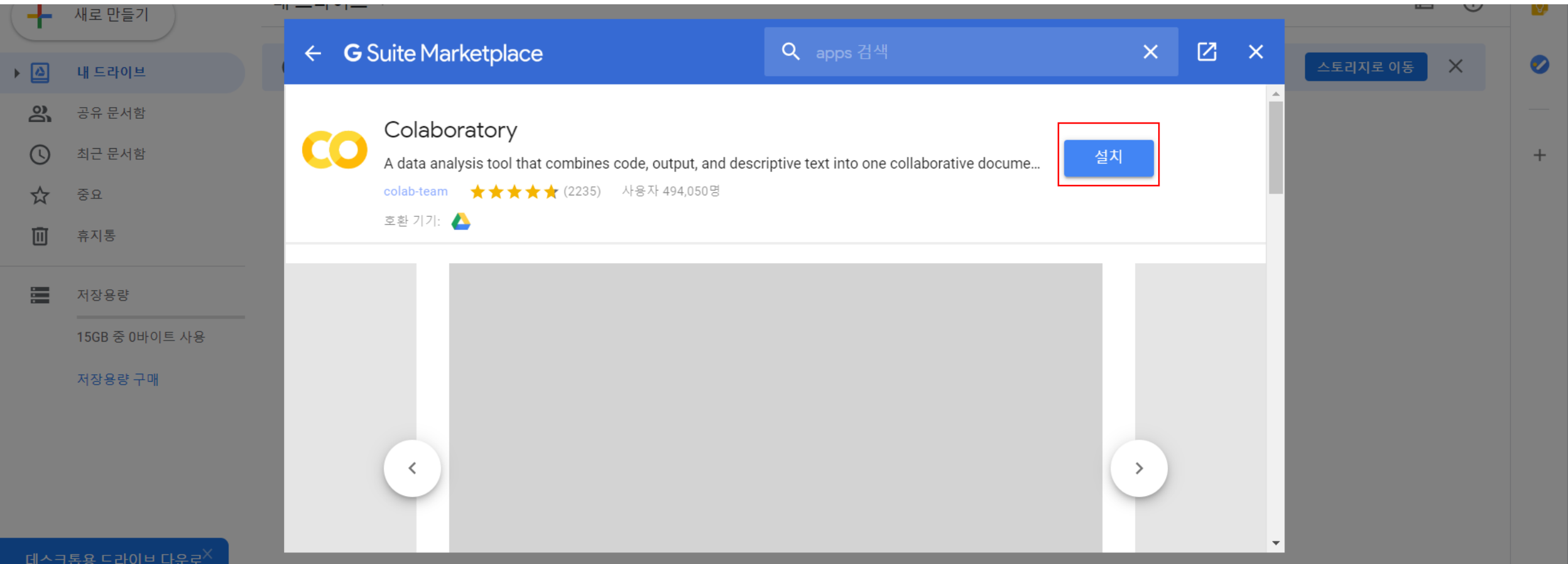- https://bryan7.tistory.com/1077

How to use – getting started

- You need a google account
- Google drive -> 새로 만들기 -> 더보기 -> 연결할 앱 더보기
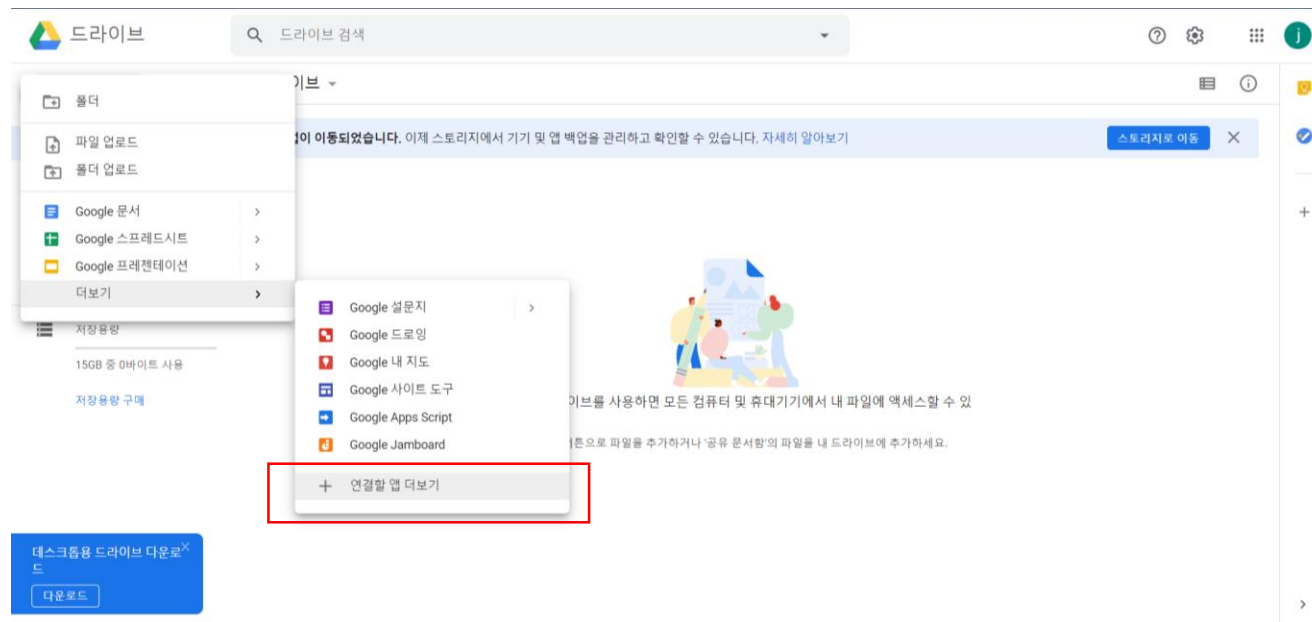
How to use – getting started

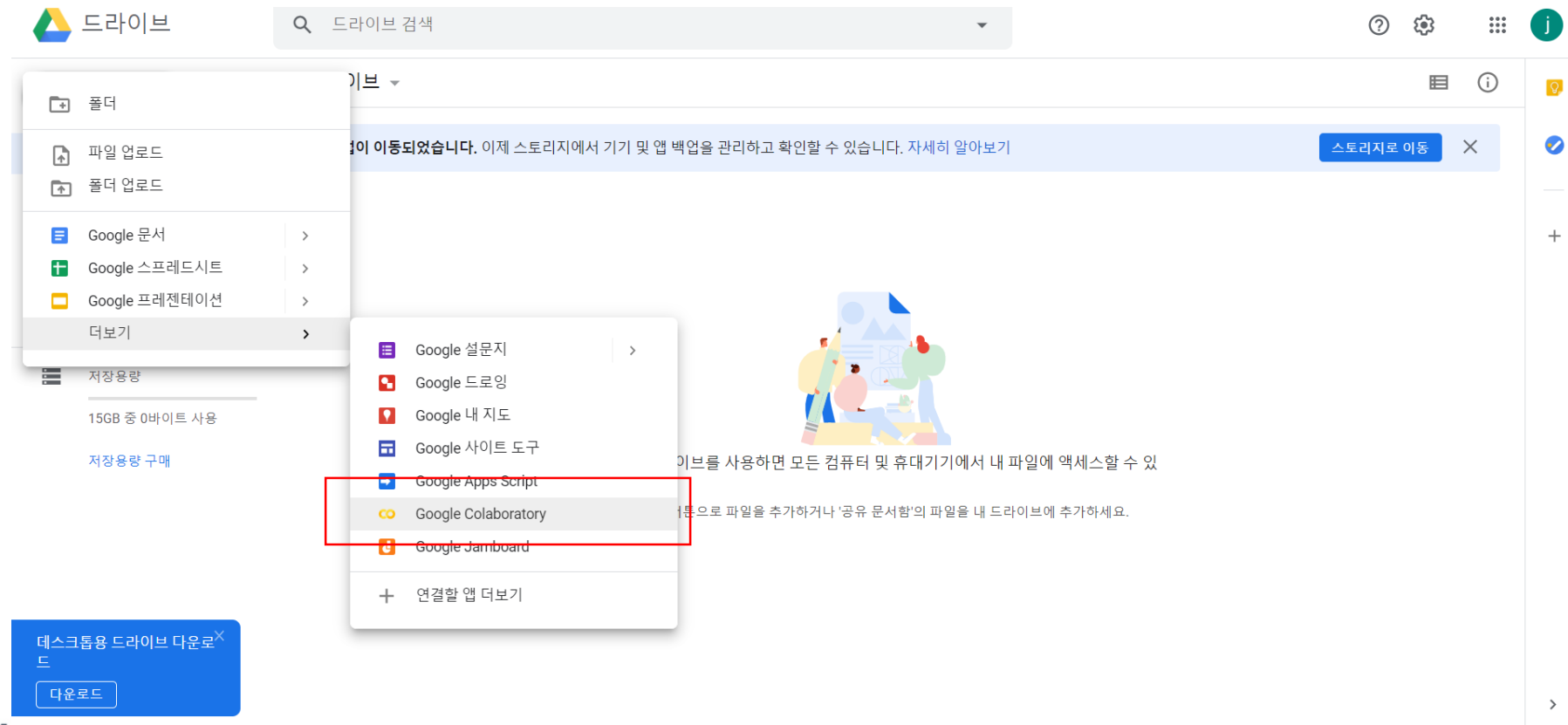- Search 'Colaboratory' and install

How to use – getting started

- Create colab project

How to use – getting started

How to use – getting started

- More information : https://colab.research.google.com/
- It is similar with Jupyter Notebook
- You can connect to Google drive, Github, Kaggle

How to use – UI

Untitled0.ipynb ☆

파일 수정 보기 삽입 런타임 도구 도움말 3월 2일에 마지막으로 수정됨

📖 댓글   👥 공유   ⚙   j

목차   ✕

+ 코드   + 텍스트

가능   ∧

<> **HELLO WORLD!**

Currently opened note (you can modify name)

Menu bar
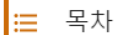
star pyramid

📁 ⊞ 섹션

HELLO WORLD!

```
[ ]    1 name = "your name"
       2
       3 print("HELLO COLAB")
       4 print("HELLO "+name)
```

```
☐→   HELLO COLAB
     HELLO your name
```

star pyramid

```
[ ]    1 print("Type pyramid level")
       2 level = int(input())
```

```
☐→   Type pyramid level
     3
```

```
[ ]    1 k = 2*level-2
       2 for i in range(0,level):
       3   for j in range(0,k):
       4     print(end=" ")
       5   k=k-1
       6
       7   for j in range(0, i+1):
       8     print("* ",end="")
```

How to use – UI

When you save current file using File→ Save,
The file will be saved at [Colab Notebooks / file name] in your googld drive

소프트웨어융합학과

How to use – UI

Add code cell, text cell

How to use – UI

Current state of note

How to use – UI

Text cell
You can write comment
This cell not executed

Using '#', You can add section

How to use – UI

Code cell
You can code that will be executed

How to use – UI

HELLO WORLD!

```
1 name = "your name"
2
3 print("HELLO COLAB")
4 print("HELLO "+name)
```

```
HELLO COLAB
HELLO your name
```

star pyramid

Result of code cell
Each code cell can be executed separately
Also, It have its own result space

Using play button or 'ctrl+enter', you can execute each code cell
'ctrl+f9' is execute whole code cell of the note

How to use – UI

Control box of cell

Using this, you can move, delete, leave comment and so on!

How to use – UI

How to use – UI

This is code snippets

You can search and use code about Google Colab

How to use – UI

This is file explorer in your environment.

How to use – environment setting

- Runtime setting
  - 런타임 -> 런타임 유형 변경 -> 런타임 유형 : python3, 하드웨어 가속기 : GPU
- Check session
  - Click 연결
  - It will change : 할당중.. > 연결중.. > 초기화중.. and show environment information

소프트웨어융합학과
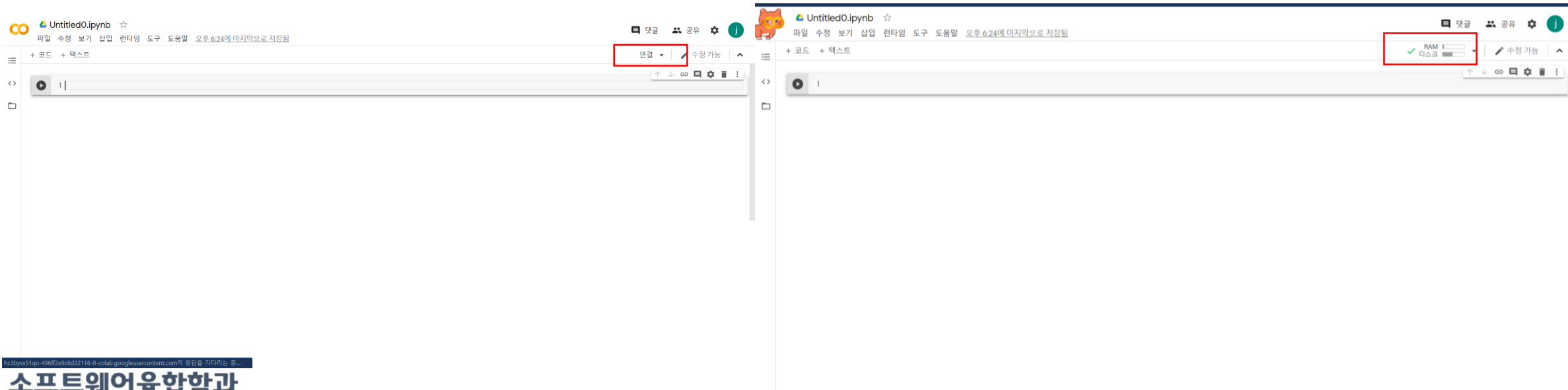
How to use – environment check

- Now you ready to use colab

- Check your devices

- Type code :
    from tensorflow.python.client import device_lib
    device_lib.list_local_devices()

소프트웨어융합학과

How to use – environment check

- Add code cell
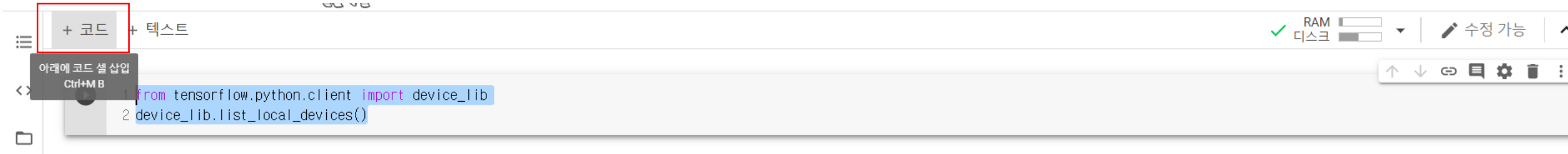
- !cat /proc/meminfo
- !cat /proc/cpuinfo

소프트웨어융합학과
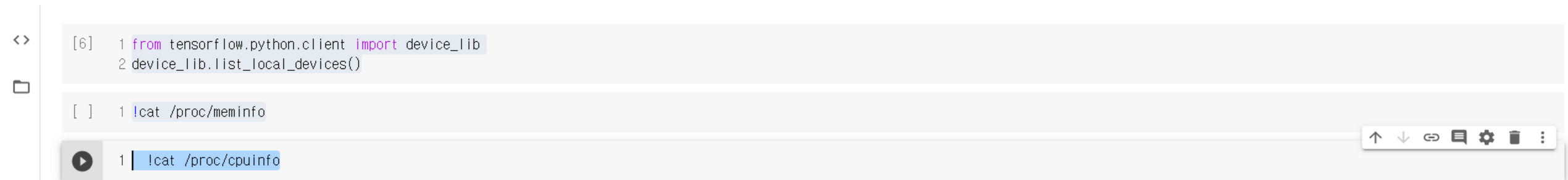
How to use – environment check

- Check result : run all code cell (ctrl + F9)

- You can see GPU, RAM, CPU information of your device
  - GPU : Tesla P100-PCIE-16GB
  - Memory : 13335180 kB
  - CPU : Intel(R) Xeon(R) CPU @ 2.30GHz

- +텍스트 : add text cell, Text cell is similar with comment
  - '#' for create section

목차

HELLO WORLD!

star pyramid

섹션

+ 코드   + 텍스트

RAM
디스크

수정 가능

HELLO WORLD!

HELLO WORLD!
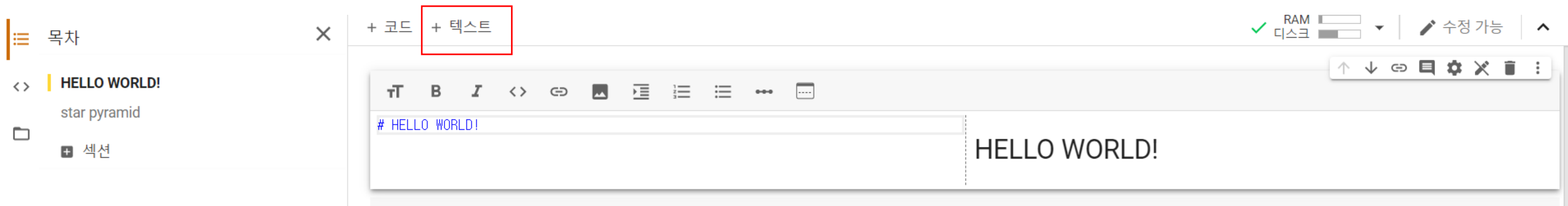
How to connect google drive

- As google colab is a Docker environment, you have to save the dataset, weights, environment package separately before terminate session

- You can use Google drive to save them, and it may be comfortable

- Of course, the code(note) will save in Google drive as .ipynb

How to connect google drive

You can easily add the mount code form code snippets searching 'Mounting Google Drive in your VM'

How to connect google drive

Untitled0.ipynb

파일 수정 보기 삽입 런타임 도구 도움말

코드 스니펫

Google

Mounting Google Drive in your VM →

Open files from Google Drive →

Listing files in Google Drive →

Importing data from Google Sheets →

Saving data to Google Drive →

Mounting Google Drive in your VM   삽입

The example below shows how to mount your Google Drive in your virtual machine using an authorization code, and shows a couple of ways to write & read files there. Once executed, observe the new file (foo.txt) is vis...
https://drive.google.com/
Note this only supports reading and...

```
1 from google.colab import dr...
2 drive.mount('/gdrive')
```

```
1 with open('/gdrive/My Drive/foo.txt',
2   f.write('Hello Google Drive!')
3 !cat '/gdrive/My Drive/foo.txt'
```

+ 코드   + 텍스트

HELLO WORLD!

```
1 name = "your name"
2
3 print("HELLO COLAB")
4 print("HELLO "+name)
```

```
HELLO COLAB
HELLO your name
```

```
1 from google.colab import drive
2 drive.mount('/gdrive')
```

```
1 with open('/gdrive/My Drive/foo.txt', 'w') as f
2   f.write('Hello Google Drive!')
3 !cat '/gdrive/My Drive/foo.txt'
```

```
1 print("Type pyramid level")
2 level = int(input())
```

```
Type pyramid level
3
```

You can easily move this code cell position using arrow button

This is the code that you added

How to connect google drive


```
1 from google.colab import drive
2 drive.mount('/content/gdrive', force_remount=True)
```

Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=947318989803-6bn6qk8qdgf4n4g3pfee6491hc0brc4i.apps.googleusercontent.com&redirect_uri=urn%3aietf%3awg%3aoauth%3a2.0...

Enter your authorization code:

Run this code cell!

1. Click URL to login google drive that you want mount
2. Permit access
3. Copy access code and paste it in the text box and enter!

*recommend mounted path as '/content/gdrive'

How to connect google drive
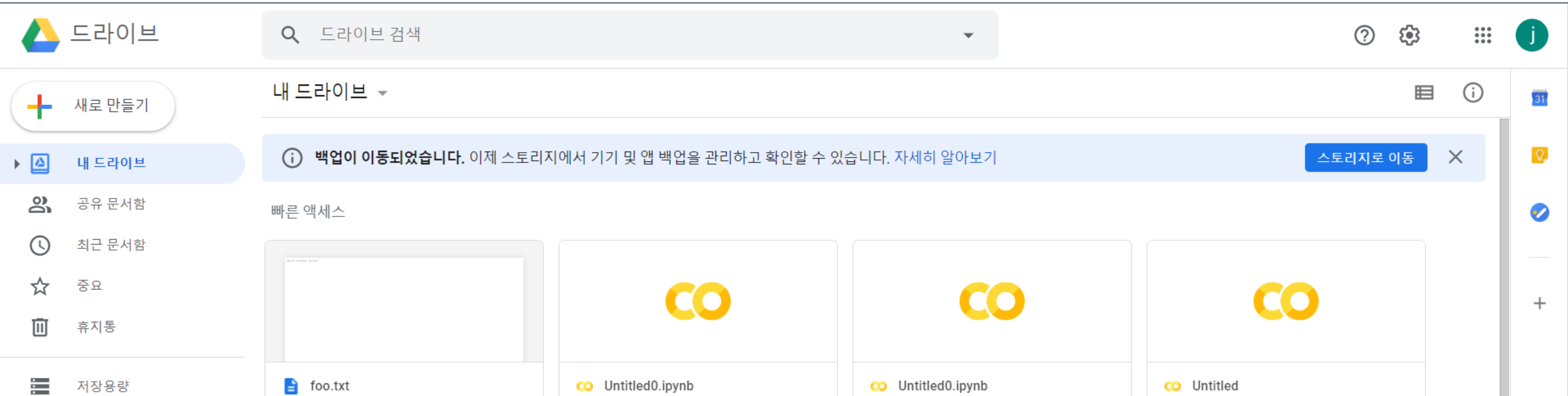

You can see mounted Google drive!

How to connect google drive

- Try this code

```python
with open('/content/gdrive/My Drive/foo.txt', 'w') as f:
  f.write('Hello Google Drive!')
!cat '/content/gdrive/My Drive/foo.txt'
```

- You will get foo.txt file

How to sharing the note

How to sharing the note with Google drive

소프트웨어융합학과

How to sharing the note with link

소프트웨어융합학과

How to sharing the note with link

Copy and paste it!

reference

- https://zzsza.github.io/data/2018/08/30/google-colab/
- https://jisoo-coding.tistory.com/2
- https://magenta.tensorflow.org/demos/colab/
- https://teddylee777.github.io/machine-learning/Google-colab%EC%9C%BC%EB%A1%9C-GPU-%EB%B6%80%EC%8A%A4%ED%8A%B8%EB%B0%9B%EC%95%84-machine-learning-%ED%95%99%EC%8A%B5%ED%95%98%EA%B8%B0

소프트웨어융합학과

Library 설치

- OpenCV
  - 설치되어 있음
  - 현재 버전: 4.6.0

```
import cv2

cv2.__version__
```
```
'4.6.0'
```

- Open3D
  - !pip install open3d

```
      Successfully uninstalled nbformat-5.7.3
Attempting uninstall: ipywidgets
    Found existing installation: ipywidgets 7.7.1
    Uninstalling ipywidgets-7.7.1:
      Successfully uninstalled ipywidgets-7.7.1
Successfully installed addict-2.4.0 configargparse-1.5.3 dash-2.9.1 dash-core-components-2.0.0 dash-html-components-2.0.0 dash-table-5.0.0 ipywidgets-8.0.4 jedi-0.18
```

THANK YOU

Hyoseok Hwang