



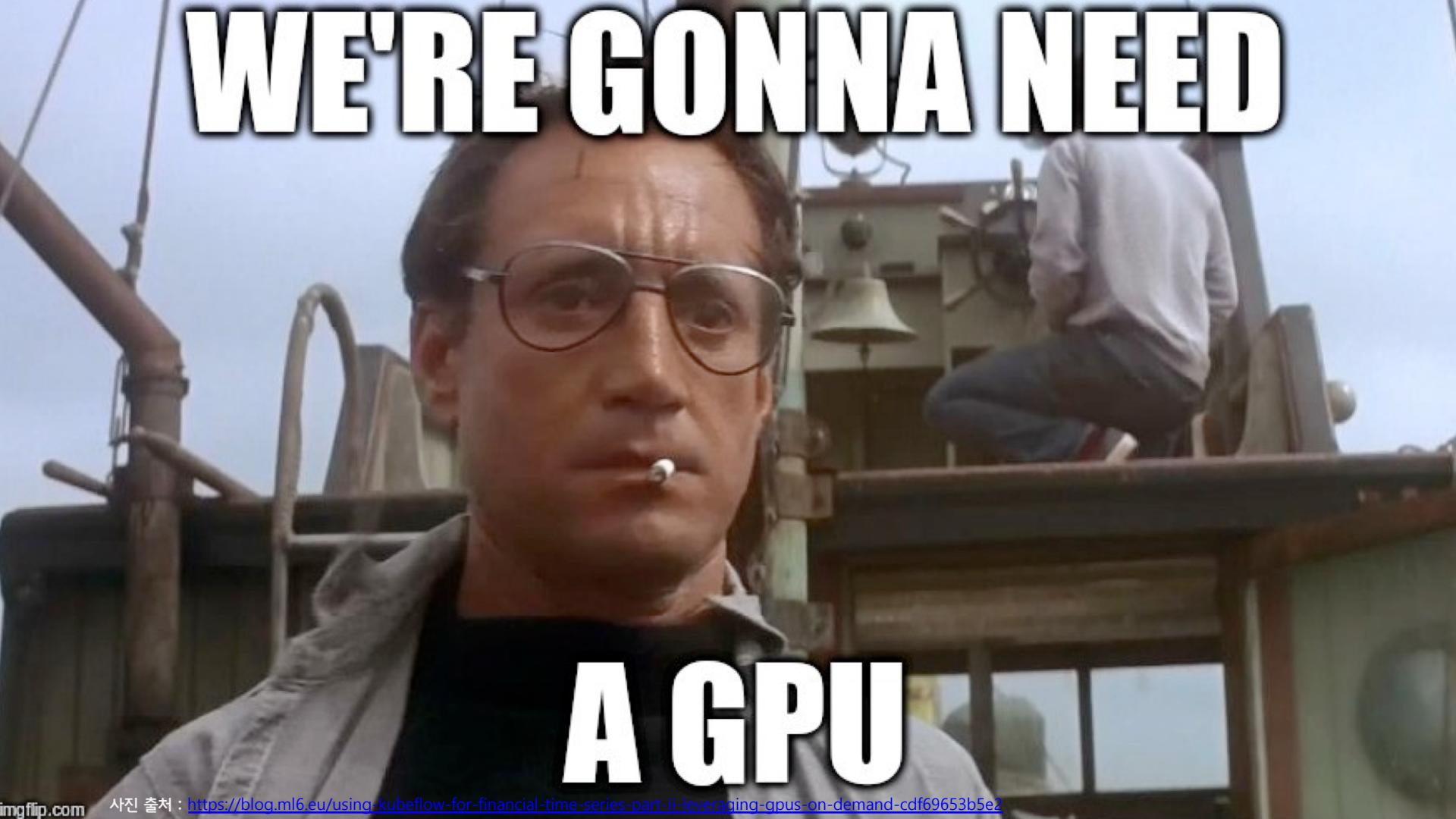
# Colab 으로 Modulab

모두의연구소

박은수 Research Director

# WE'RE GONNA NEED

# A GPU





사무실 한 쪽이 번쩍번쩍!!  
동료도 늘어나고, 살림살이도 늘어가고 있습니다.  
쾌속 순항!!



회원님, Seungil Kim, 우태강, 외 135명

댓글 35개



Eunsoo Park 와 너무너무 멋집니다 가격이 어마어마 할것 같아요~~

좋아요 · 답글 달기 · 1일



Eunsoo Park 개인이 사기엔 부담스럽죠 ㅠ

좋아요 · 답글 달기 · 1일



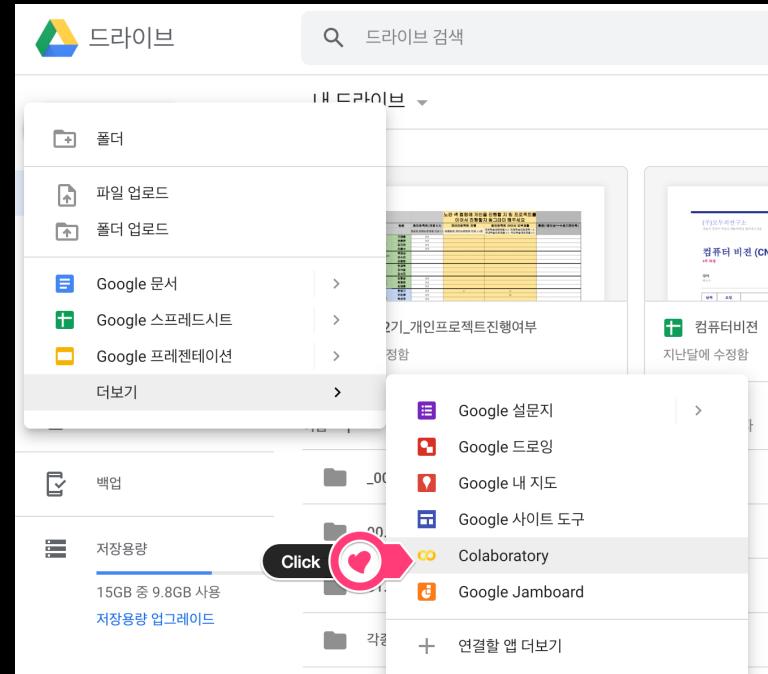
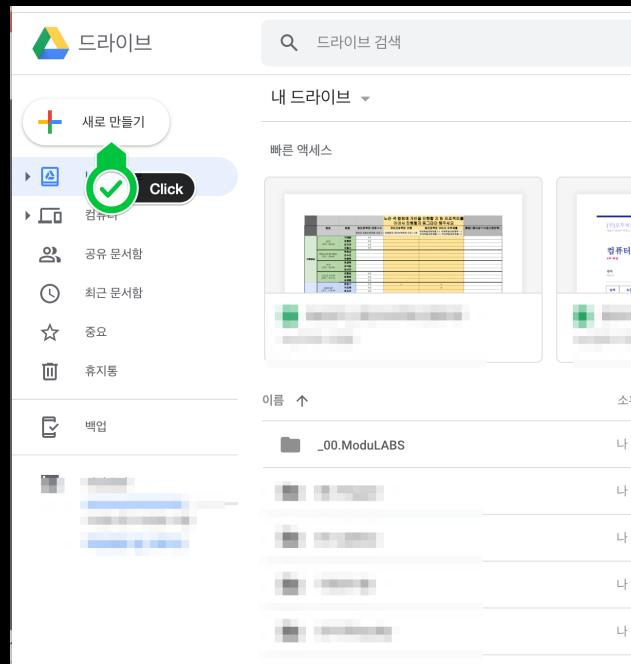
# Colab 쓰면 좋은 점

- 어느정도 꽁짜로 GPU 쓸 수 있음
- 많이 쓰는 파이썬 패키지들이 이미 설치 되어 있음
- Jupyter notebook 환경을 제공함
- 구글 독스처럼 코딩 가능함 (말그대로 Co-laboratory)
- 구글 드라이브를 활용 할 수 있음



# Colab 켜기

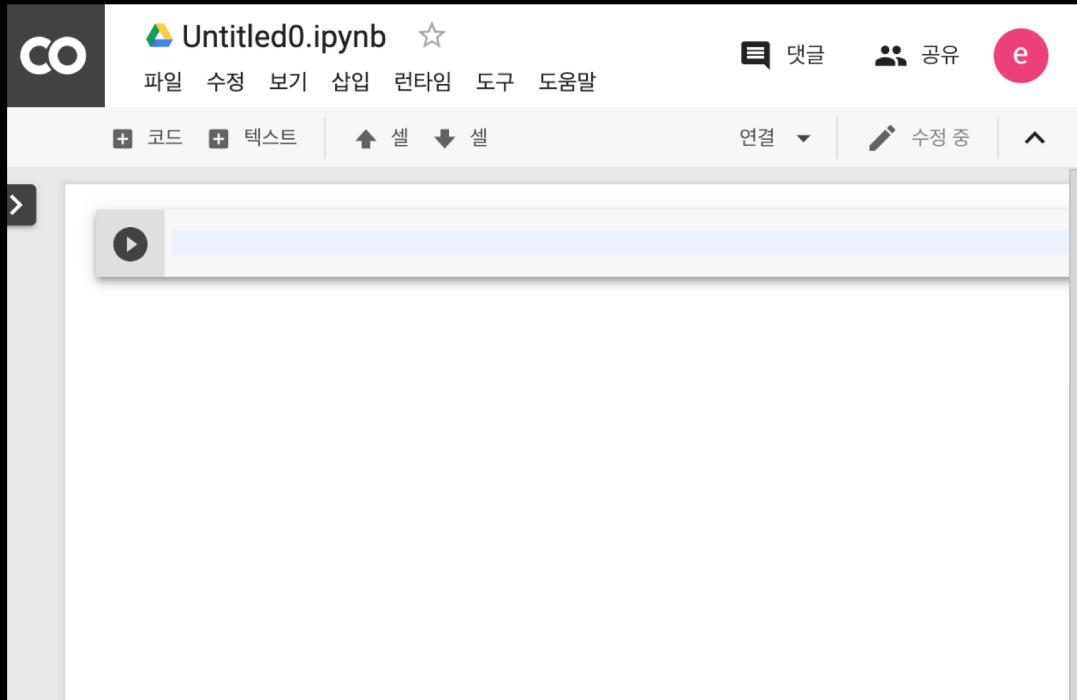
## 구글드라이브에서



# Colab 켜기



짠~~!!



# Colab에 구글드라이브 붙이기



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

여기 넣은 폴더명(gdrive) 밑에 여러분의 구글 드라이브가  
**'My Drive'**란 폴더명으로 붙게 됩니다

여러분의 구글드라이브에 접속하기 위한 인증 절차가 시작됩니다



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

... Go to this URL in a browser: [https://accounts.google.com/o/oauth2/auth?client\\_id=9473](https://accounts.google.com/o/oauth2/auth?client_id=9473)

Enter your authorization code:

# Colab에 구글드라이브 붙이기



```
[ ] from google.colab import drive  
drive.mount('/gdrive')
```

... Go to this URL in a browser: [https://accounts.google.com/o/oauth2/auth?client\\_id=673041333571-4j63qj3k3r1t3vq3v3u0u6s1d4f1n6u.apps.googleusercontent.com&redirect\\_uri=https%3A%2F%2Flocalhost%2F%2F40400&response\\_type=code&scope=https://www.googleapis.com/auth/drive](https://accounts.google.com/o/oauth2/auth?client_id=673041333571-4j63qj3k3r1t3vq3v3u0u6s1d4f1n6u.apps.googleusercontent.com&redirect_uri=https%3A%2F%2Flocalhost%2F%2F40400&response_type=code&scope=https://www.googleapis.com/auth/drive)

Enter your authorization code:

1) Click



2) 클릭 후 만들어지는 로그인 코드를 복사 후 붙여 넣으세요

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

↳ Go to this URL in a browser: [https://accounts.google.com/o/oauth2/auth?client\\_id=673041333571-4j63qj3k3r1t3vq3v3u0u6s1d4f1n6u.apps.googleusercontent.com&redirect\\_uri=https%3A%2F%2Flocalhost%2F%2F40400&response\\_type=code&scope=https://www.googleapis.com/auth/drive](https://accounts.google.com/o/oauth2/auth?client_id=673041333571-4j63qj3k3r1t3vq3v3u0u6s1d4f1n6u.apps.googleusercontent.com&redirect_uri=https%3A%2F%2Flocalhost%2F%2F40400&response_type=code&scope=https://www.googleapis.com/auth/drive)

Enter your authorization code:

.....

Mounted at /gdrive

3) 오~ 된것 같아요~!

# Colab에 구글드라이브 붙이기



- ‘!’ 를 앞에 Command line prompt에서 할 수 있는 명령어를 넣을 수 있어요

신기신기 하다~~!!!!

```
!ls -al |"/gdrive/My Drive"
total 80
drwx----- 2 root root 4096 Oct 12 10:23 .
drwx----- 2 root root 4096 Aug 25 10:23 ..
drwx----- 2 root root 4096 Apr 25 10:23 AppData
drwx----- 2 root root 4096 Oct 12 10:23 Desktop
drwx----- 2 root root 4096 Oct 12 10:23 Documents
drwx----- 2 root root 4096 Aug 25 10:23 Downloads
drwx----- 2 root root 4096 Mar 25 10:23 Music
drwx----- 2 root root 4096 Feb 25 10:23 Pictures
```

ls -al :

- ls : 폴더의 내용을 보여줘란 명령어
- -al : 모든 파일걸(a) 리스트형태(l)로 보여줘  
란 옵션

# 구글드라이브에 모델 저장



오 폴더도 만들어 진다~!

대박!!!



```
[8] !mkdir "/gdrive/My Drive/Co_data"
```

```
!ls -al "/gdrive/My Drive/"
```

```
total 84
drwx----- 2 root root 4096
drwx----- 2 root root 4096 Apr 19 11:21 Co_data
drwx----- 2 root root 4096
-rw----- 1 root root 1
```

# 구글드라이브에 모델 저장



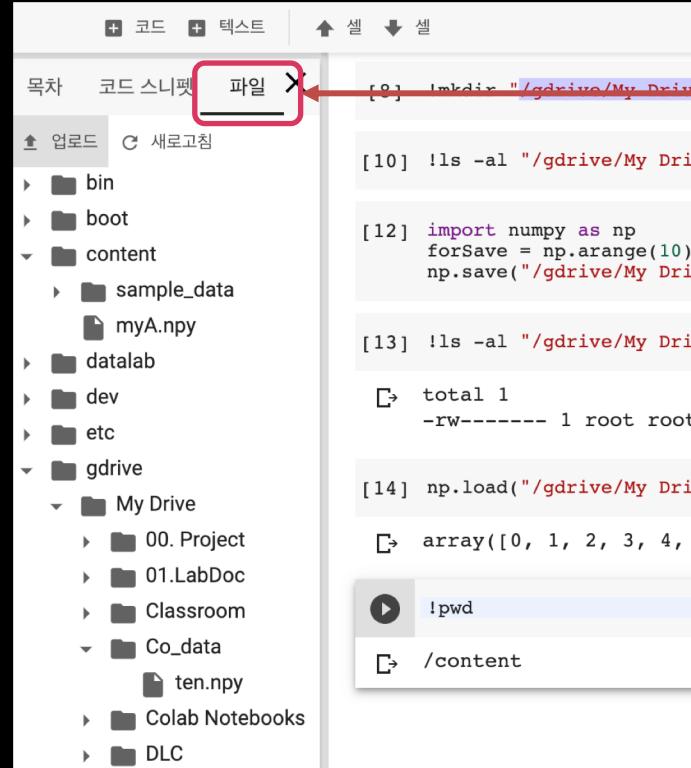
바로 저장도 된다~

```
[12] import numpy as np  
forSave = np.arange(10)  
np.save("/gdrive/My Drive/Co_data/ten", forSave)  
  
[13] !ls -al "/gdrive/My Drive/Co_data"  
  
↳ total 1  
-rw----- 1 root root 208 Apr 19 11:31 ten.npy
```

로드도 된다~

```
▶ np.load("/gdrive/My Drive/Co_data/ten.npy")  
  
↳ array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

# 구글드라이브에 모델 저장



```
[9] !mkdir "/gdrive/My Drive"
[10] !ls -al "/gdrive/My Drive"
[12] import numpy as np
      forSave = np.arange(10)
      np.save("/gdrive/My Drive/ten.npy", forSave)
[13] !ls -al "/gdrive/My Drive"
[14] np.load("/gdrive/My Drive/ten.npy")
[15] array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
[16] !pwd
[17] /content
```

사실 여기 누르면  
다 볼 수 있었음



# 구글드라이브에 모델 저장



The screenshot shows the Google Colab interface. On the left is a file browser with the following directory structure:

- Up arrow
- 업로드 (Upload)
- 코드 스니펫 (Code Snippets)
- 파일 (File) - highlighted with a red box
- Content (highlighted with a red box)
- sample\_data
- myA.npy
- databab
- dev
- etc
- gdrive
  - My Drive
    - 00. Project
    - 01.LabDoc
    - Classroom
    - Co\_data
      - ten.npy
    - Colab Notebooks
    - DLC

In the center, the text "Colab Working Directory" is displayed in blue. On the right, the terminal output shows the following commands and results:

```
[9] !mkdir "/gdrive/My_Drive"
[10] !ls -al "/gdrive/My_Drive"
[11] import numpy as np
forSave = np.arange(10)
np.save("/gdrive/My_Drive/ten.npy", forSave)
[12] !ls -al "/gdrive/My_Drive"
[13] !ls -al "/gdrive/My_Drive"
[14] total 1
-rw----- 1 root root
[15] np.load("/gdrive/My_Drive/ten.npy")
[16] array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
[17] !pwd
[18] /content
```

사실 여기 누르면  
다 볼 수 있었음



# 구글드라이브에 모델 저장



Colab Working  
Directory

내 마운트 된 Google  
Drive

The screenshot shows the Google Colab interface. On the left, there's a sidebar with various directories like bin, boot, content, etc. A red box highlights the 'content' folder. Below it, under 'gdrive', another red box highlights the 'My Drive' folder. On the right, the main area shows a terminal window with the following code and output:

```
[9] !mkdir "/gdrive/My_Drive"
[10] !ls -al "/gdrive/My_Drive"
[11]
[12] import numpy as np
     forSave = np.arange(10)
     np.save("/gdrive/My_Drive/ten.npy", forSave)
[13] !ls -al "/gdrive/My_Drive"
[14] total 1
     -rw----- 1 root root
[15] np.load("/gdrive/My_Drive/ten.npy")
[16] array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
[17] !pwd
[18] /content
```

사실 여기 누르면  
다 볼 수 있었음



# 실습 : 다음 파일 Colab에서 실행 시켜보기



[https://github.com/keras-team/keras/blob/master/examples/mnist\\_cnn.py](https://github.com/keras-team/keras/blob/master/examples/mnist_cnn.py)

1) Click

Branch: master [keras / examples / mnist\\_cnn.py](#) Find file Copy path

treszkai Remove word "shuffled" from comments in examples (#9453) 4f2e65c on 23 Feb 2018

5 contributors

71 lines (59 sloc) | 2.2 KB

Raw Blame History

```
1 """Trains a simple convnet on the MNIST dataset.
2
3 Gets to 99.25% test accuracy after 12 epochs
4 (there is still a lot of margin for parameter tuning).
5 16 seconds per epoch on a GRID K520 GPU.
6 ...
7
8 from __future__ import print_function
9 import keras
```

''' Trains a simple convnet on the MNIST dataset.

Gets to 99.25% test accuracy after 12 epochs  
(there is still a lot of margin for parameter tuning).

16 seconds per epoch on a GRID K520 GPU.

...

```
from __future__ import print_function
import keras
from keras.datasets import mnist
from keras.models import Sequential
from keras.layers import Dense, Dropout, Flatten
from keras.layers import Conv2D, MaxPooling2D
from keras import backend as K

batch_size = 128
num_classes = 10
epochs = 12

# input image dimensions
img_rows, img_cols = 28, 28
```

2)

뒤로  
앞으로(F)  
새로고침  
다른 이름으로 저장...  
인쇄

mnist\_cnn.py 를 Colab에 업로드 후 실행해 보세요

Github 주소를 이용해 바로Colab에서 열 수도 있습니다 (아래 링크서 찾아보세요) :

<https://zszsa.github.io/data/2018/08/30/google-colab/>

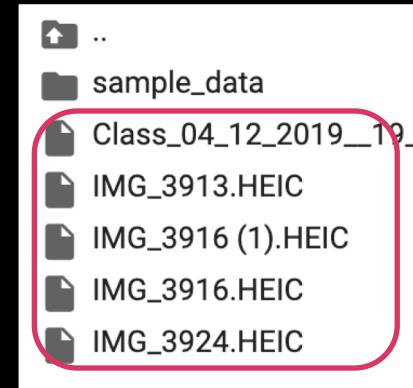


# 파일 업로드 하기

```
from google.colab import files  
uploaded = files.upload()
```

```
from google.colab import files  
uploaded = files.upload()  
  
...  
파일 선택 파일 3개  
• IMG_3913.HEIC(image/heic) - 1489962 bytes, last modified: 2019. 4. 12. - 14% done  
Saving IMG_3913.HEIC to IMG_3913.HEIC
```

파일선택하고 업로드할 수 있는 버튼이 나타나고 변수 및 디스크에 저장됨



워킹 디렉토리로 업로드된 새로운 데이터들

# 실습 : 익숙해지기



- Forms Example
  - <https://colab.research.google.com/notebooks/forms.ipynb>
- Forms Snippets
  - <https://colab.research.google.com/notebooks/snippets/forms.ipynb>
- Overview of Colaboratory Features
  - [https://colab.research.google.com/notebooks/basic\\_features\\_overview.ipynb](https://colab.research.google.com/notebooks/basic_features_overview.ipynb)



# Colab 단축키

Show keyboard shortcuts:  
Ctrl/Cmd + M + H

Actions	Colab	Jupyter
show keyboard shortcuts	Ctrl/Cmd M H	H
Insert code cell above	Ctrl/Cmd M A	A
Insert code cell below	Ctrl/Cmd M B	B
Delete cell/selection	Ctrl/Cmd M D	DD
Interrupt execution	Ctrl/Cmd M I	II
Convert to code cell	Ctrl/Cmd M Y	Y
Convert to text cell	Ctrl/Cmd M M	M
Split at cursor	Ctrl/Cmd M -	Ctrl Shift -



# 몇몇 유용한 명령어

- 운영체제 확인 : !cat /etc/issue.net
- 파이썬 버전체크 : !python --version
- CPU 사양 : !head /proc/cpuinfo
- Git clone : !git clone [git clone url]
- 메모리 사양 : !head -n 3 /proc/meminfo
- 디스크 사양 : !df -h
- GPU 정보 : !nvidia-smi
- 웹 다운로드 : !wget [url] [drive/foldername]

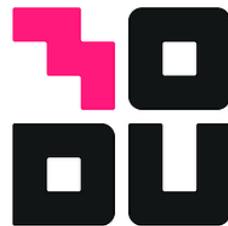
## OpenCV 설치 (설치되어 있는 것 같다)

- !pip install opencv-contrib-python



# 인용

- Getting Started With Google Colab
  - <https://towardsdatascience.com/getting-started-with-google-colab-f2fff97f594c>
- Google Colab—The Beginner’s Guide (요약 정리가 훌륭)
  - <https://medium.com/lean-in-women-in-tech-india/google-colab-the-beginners-guide-5ad3b417dfa>
- Google Colab 사용하기 (한글 : 요약이 잘 되어 있음)
  - <https://zgsza.github.io/data/2018/08/30/google-colab/>



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