

Introduction

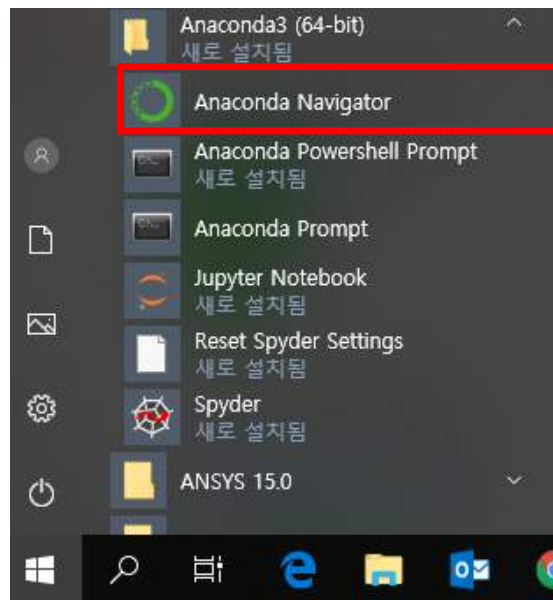
Spyder, **Jupyter Notebook**, **Google Colaboratory**

DongKook Kim
JNU

2019.7

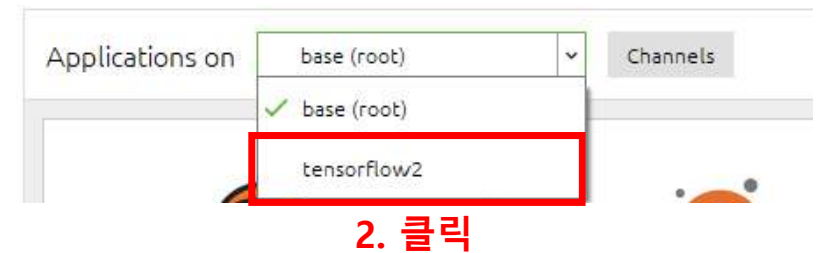
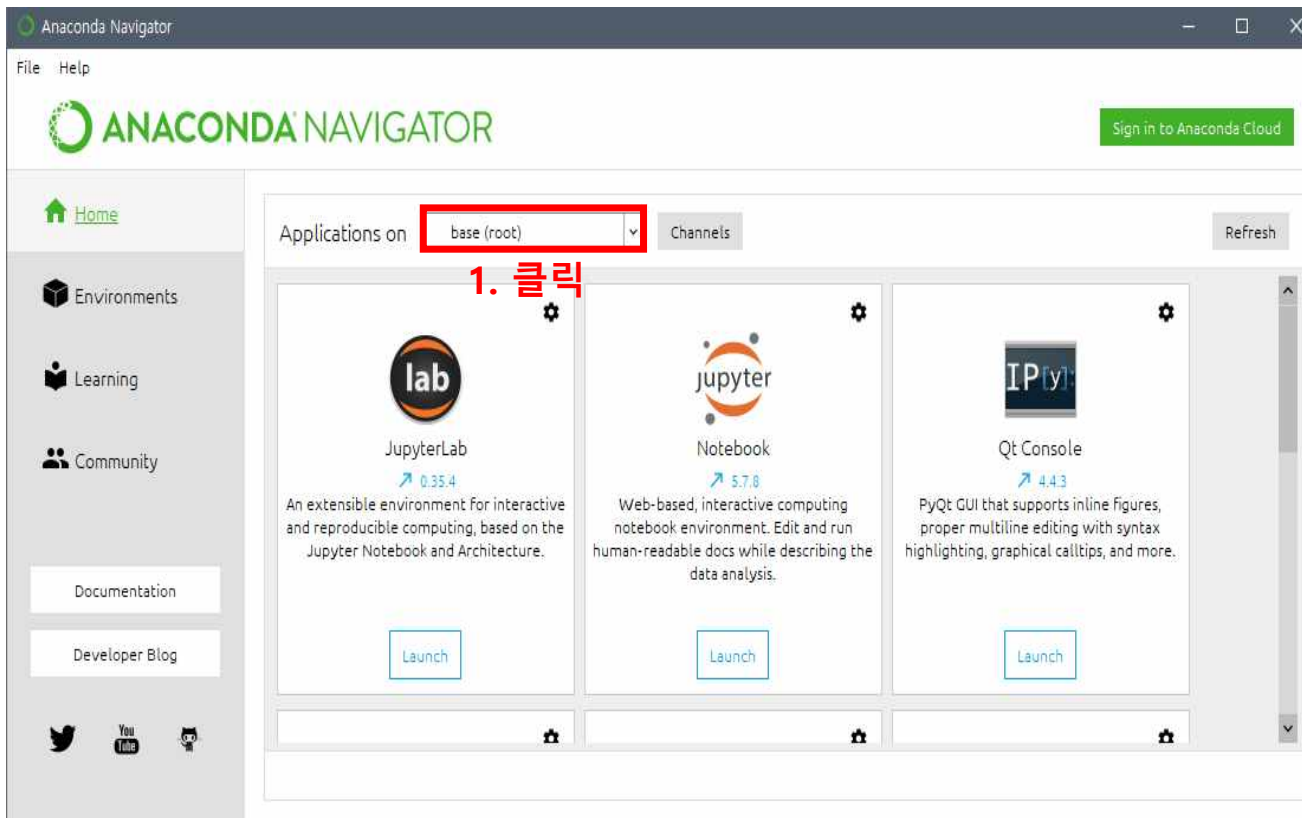
1. Spyder

Step 1. Install Spyder



Anaconda Navigator 실행









Step 1. Install Spyder



(생성한 가상환경에서 spyder를 사용하기 위함)

Step 1. Install Spyder









Applications on Channels

 Glueviz 0.13.3 Multidimensional data visualization across files. Explore relationships within and among related datasets. Install	 JupyterLab 1.0.2 An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture. Install	 Notebook 6.0.0 Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis. Install	 Orange 3 3.19.0 Component based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox. Install	 Qt Console 4.3.1 PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more. Install	 RStudio 1.1.456 A set of integrated tools designed to help you be more productive with R. Includes essentials and notebooks. Install
 Spyder 3.3.6 Scientific Python Development Environment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features. Install	 VS Code 1.36.1 Streamlined code editor with support for development operations like debugging, task running and version control. Install				

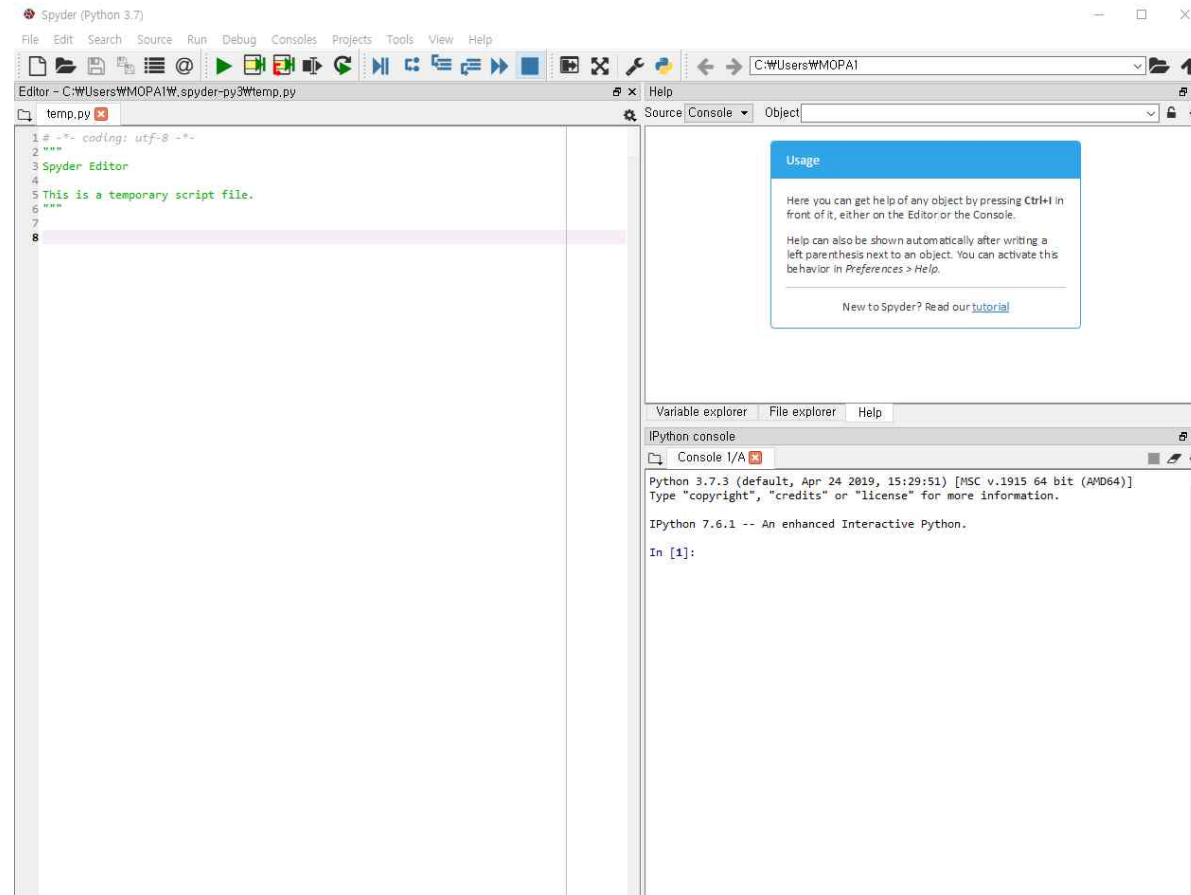
클릭

Step 2. Run Spyder (1)

Applications on tensorflow2 Channels

 IPyConsole 4.5.1 PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more. Launch	 Spyder 3.3.6 Scientific PYTHON Development Environment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features. Launch	 Glueviz 0.13.3 Multidimensional data visualization across files. Explore relationships within and among related datasets. Install	 JupyterLab 1.0.2 An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture. Install	 Notebook 6.0.0 Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis. Install	 Orange 3 3.19.0 Component based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox. Install
 RStudio 1.1.456 A set of integrated tools designed to help you be more productive with R. Includes R essentials and notebooks. Install	 VS Code 1.36.1 Streamlined code editor with support for development operations like debugging, task running and version control. Install				

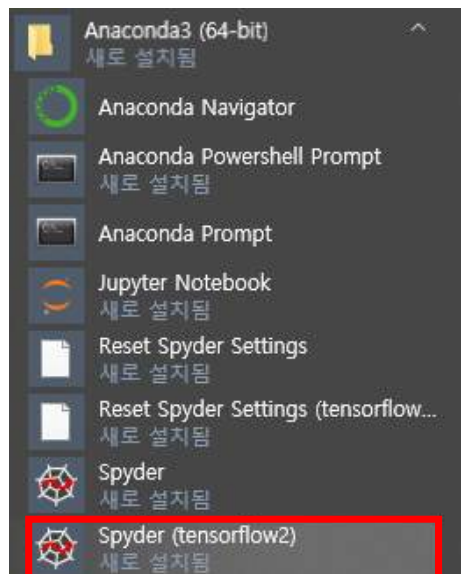
Step 2. Run Spyder (1)



Step 2. Run Spyder (2)

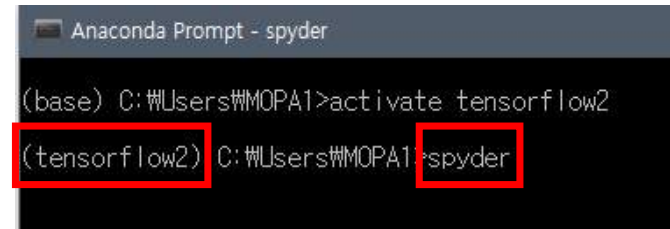
Spyder 설치 후, 다양한 방법으로 실행 가능

1. 실행메뉴에서 직접 실행



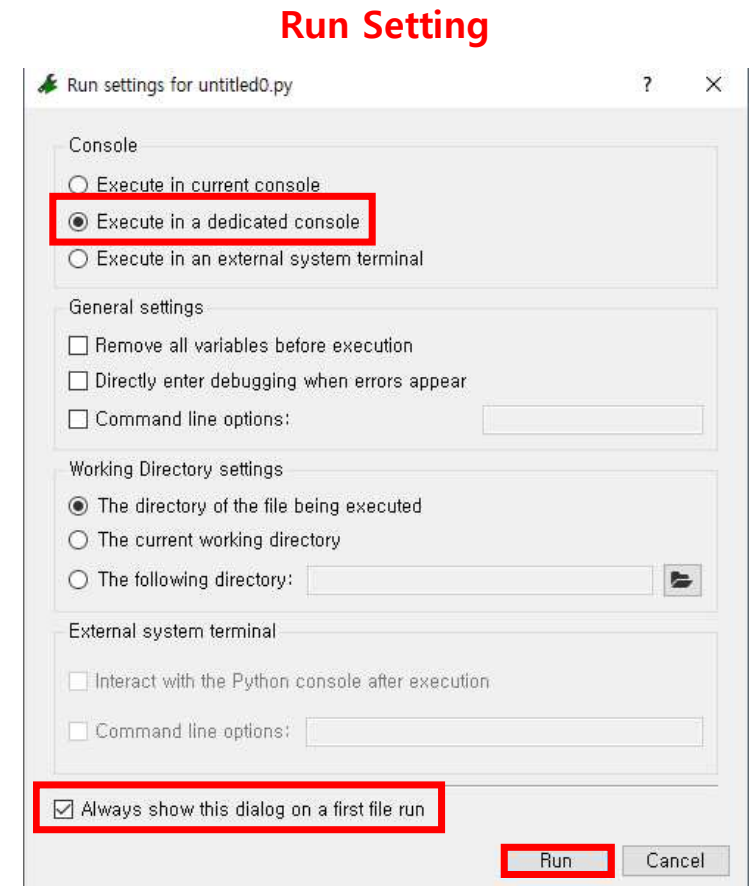
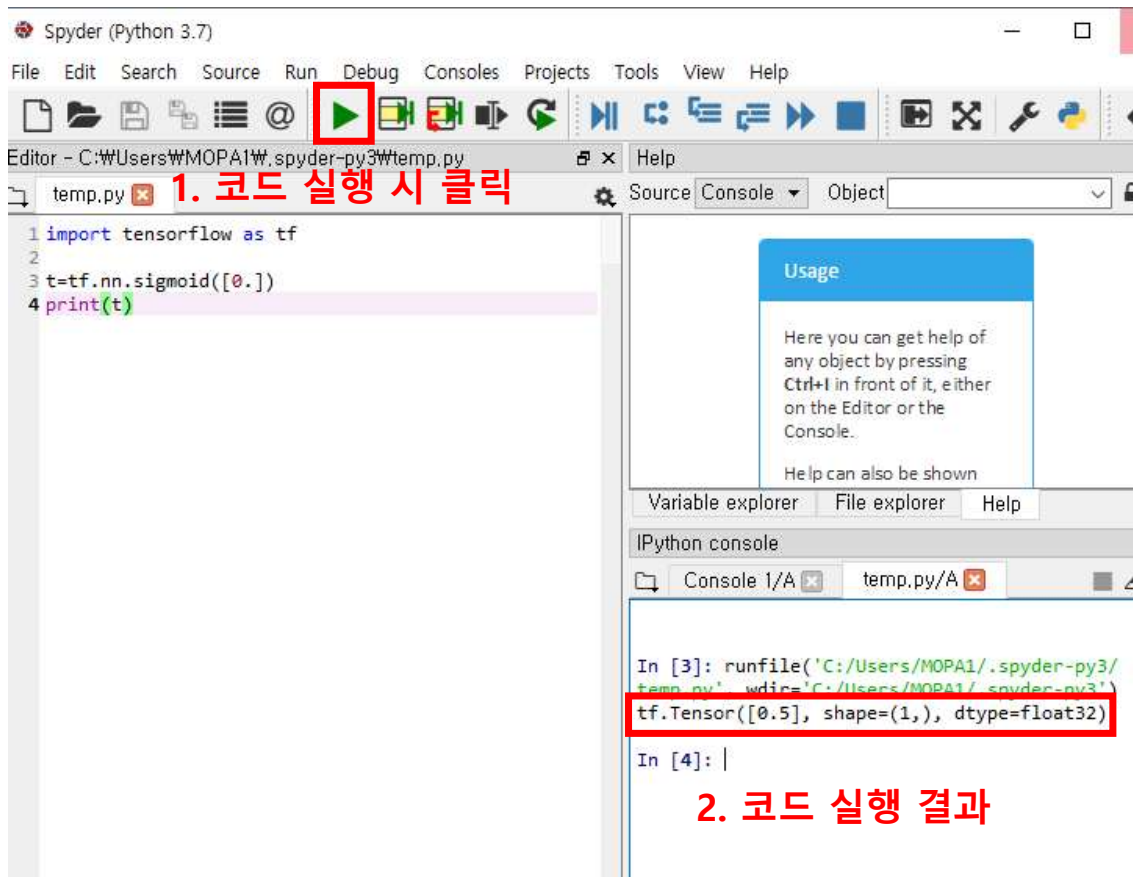
클릭

2. Anaconda Prompt를 통한 실행



spyder 입력을 통해 실행 가능
(단, 가상환경 확인 필요)

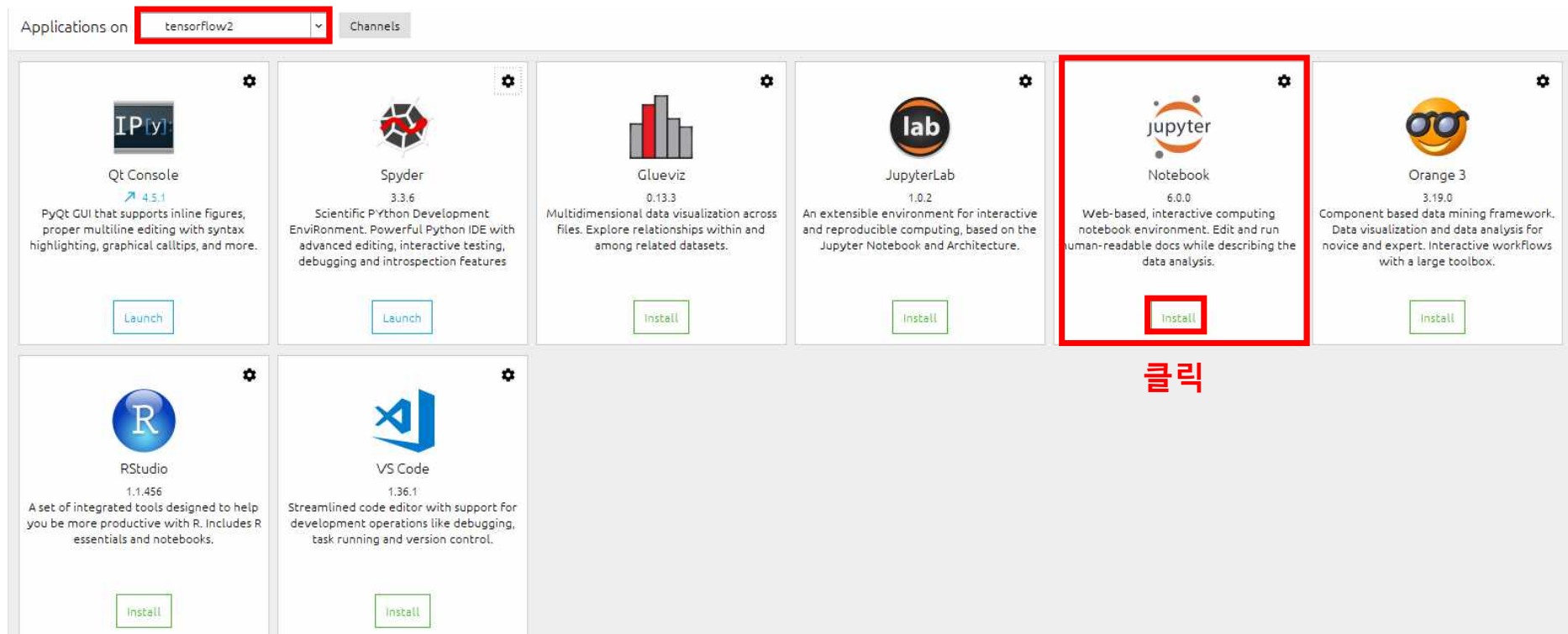
Step 3. Run Code (Spyder)



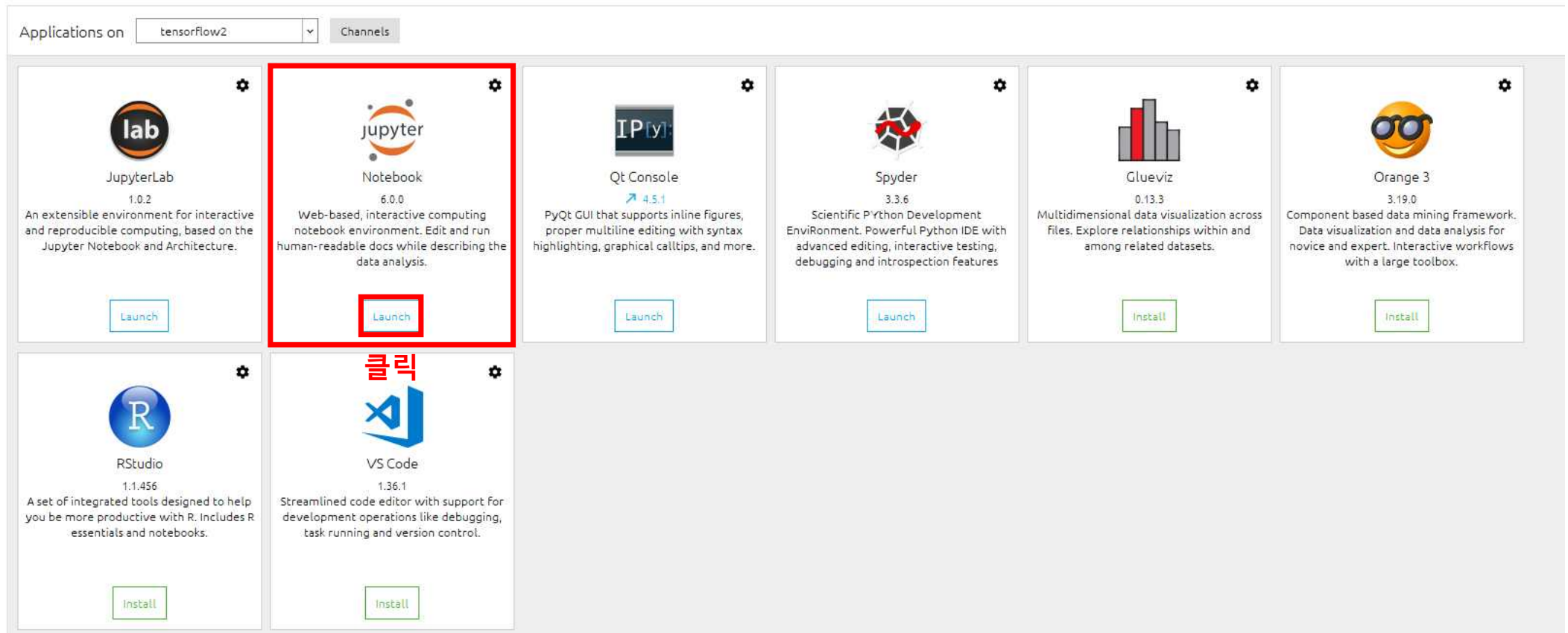
2. Jupyter Notebook

Step 1. Install Jupyter Notebook

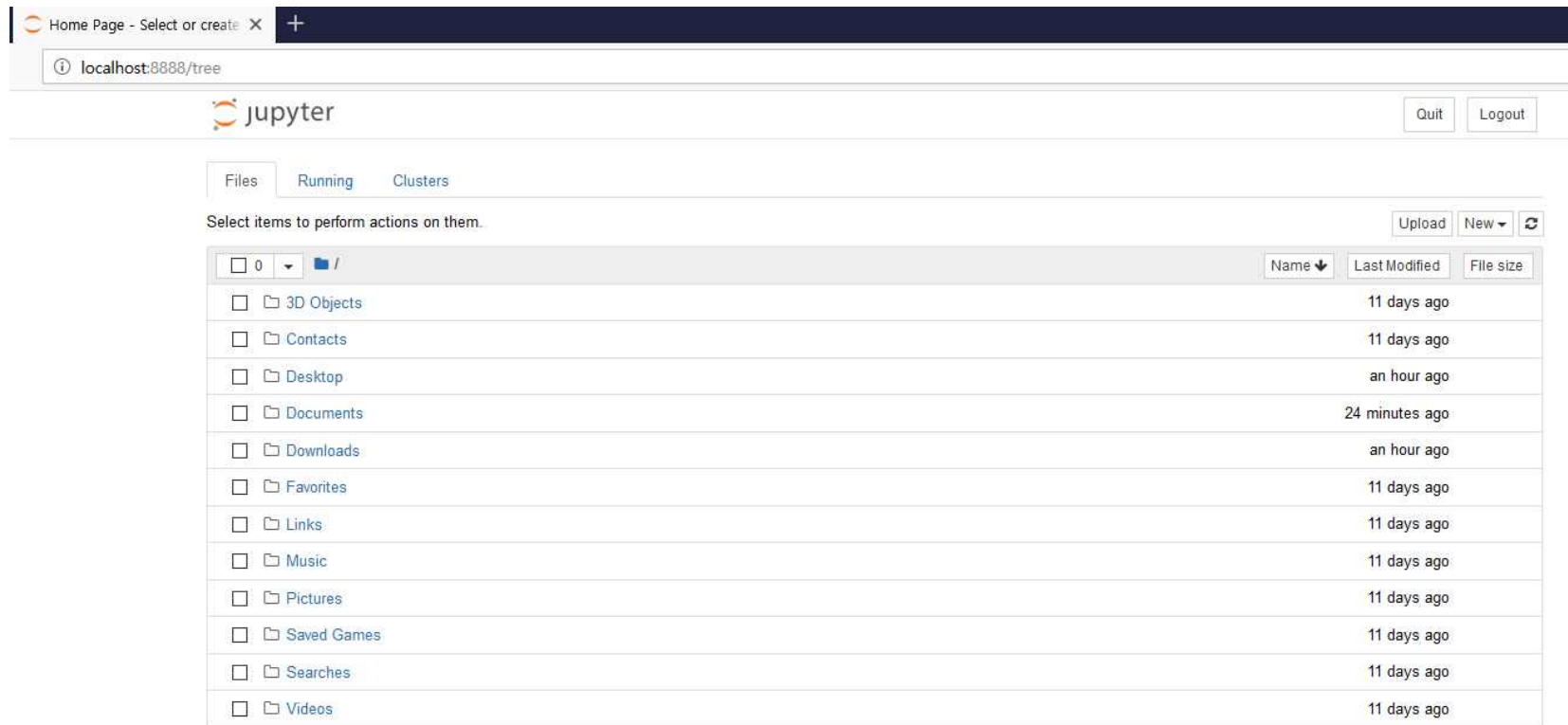
Spyder 설치 방법과 동일하게, Anaconda Navigator를 통해 설치 진행



Step 2. Run Jupyter Notebook (1)



Step 2. Run Jupyter Notebook (1)



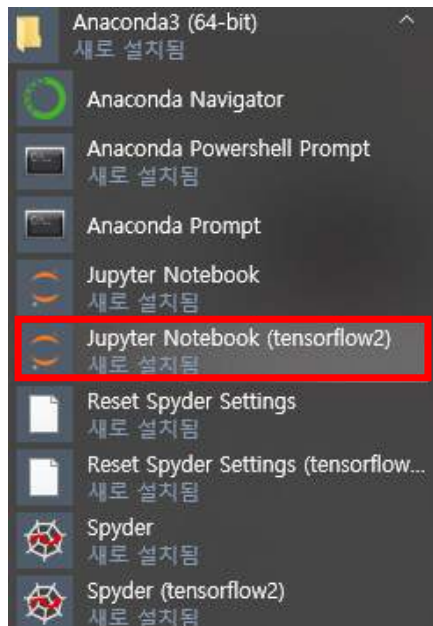
The screenshot displays the JupyterLab web interface in a browser window. The address bar shows the URL `localhost:8888/tree`. The Jupyter logo is visible in the top left, and 'Quit' and 'Logout' buttons are in the top right. Below the navigation bar, there are tabs for 'Files', 'Running', and 'Clusters', with 'Files' being the active tab. A message 'Select items to perform actions on them.' is shown above a file browser table. The table has columns for 'Name', 'Last Modified', and 'File size'. It lists various system folders like '3D Objects', 'Contacts', 'Desktop', etc., each with a checkbox on the left and a timestamp on the right. Action buttons 'Upload', 'New', and a refresh icon are located at the top right of the file list area.

	Name	Last Modified	File size
<input type="checkbox"/>	/		
<input type="checkbox"/>	3D Objects	11 days ago	
<input type="checkbox"/>	Contacts	11 days ago	
<input type="checkbox"/>	Desktop	an hour ago	
<input type="checkbox"/>	Documents	24 minutes ago	
<input type="checkbox"/>	Downloads	an hour ago	
<input type="checkbox"/>	Favorites	11 days ago	
<input type="checkbox"/>	Links	11 days ago	
<input type="checkbox"/>	Music	11 days ago	
<input type="checkbox"/>	Pictures	11 days ago	
<input type="checkbox"/>	Saved Games	11 days ago	
<input type="checkbox"/>	Searches	11 days ago	
<input type="checkbox"/>	Videos	11 days ago	

Step 2. Run Jupyter Notebook (2)

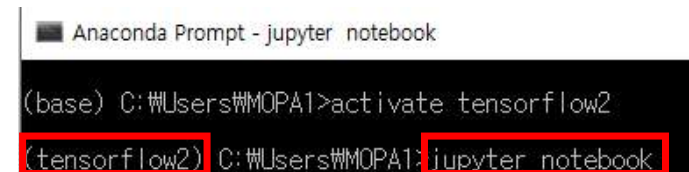
Jupyter Notebook 설치 후, 다양한 방법으로 실행 가능

1. 실행메뉴에서 직접 실행



클릭

2. Anaconda Prompt를 통한 실행



jupyter notebook 입력을 통해 실행 가능
(단, 가상환경 확인 필요)

Step 3. Run Code (1)



The image shows the JupyterLab interface. At the top, there is a 'jupyter' logo and buttons for 'Quit' and 'Logout'. Below the logo, there are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' Below this, there is a file browser showing a list of folders: 3D Objects, Contacts, Desktop, Documents, Downloads, Favorites, Links, Music, Pictures, Saved Games, Searches, and Videos. On the right side, there is a toolbar with buttons for 'Upload', 'New', and a refresh icon. The 'New' button is highlighted with a red box and labeled '1. 클릭'. A dropdown menu is open, showing 'Notebook: Python 3' (highlighted with a red box and labeled '2. 클릭'), 'Other: Text File', 'Folder', and 'Terminal'. A tooltip for the 'Python 3' option says 'Create a new notebook with Python 3'.

jupyter

Quit Logout

Files Running Clusters

Select items to perform actions on them.

Upload New ↻ 1. 클릭

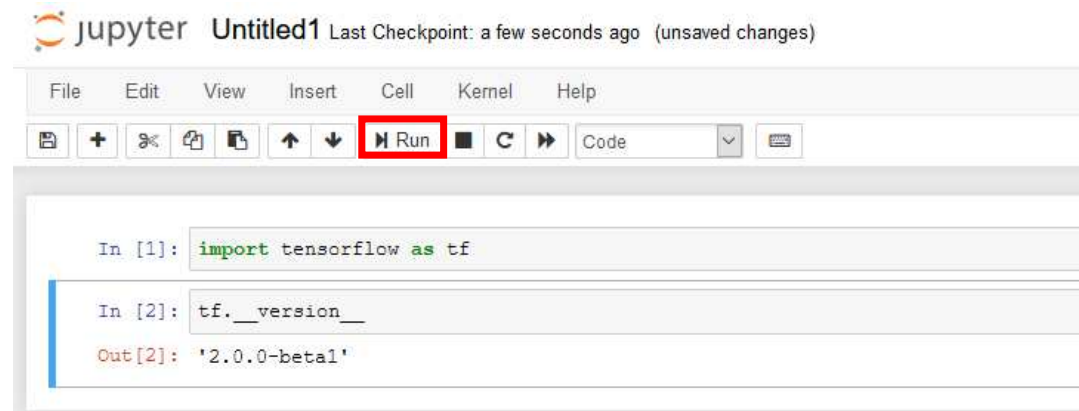
Notebook: Python 3 2. 클릭

Other: Text File Folder Terminal

Create a new notebook with Python 3

Name	an hour ago
0 /	
3D Objects	
Contacts	
Desktop	
Documents	
Downloads	
Favorites	
Links	
Music	
Pictures	
Saved Games	
Searches	
Videos	

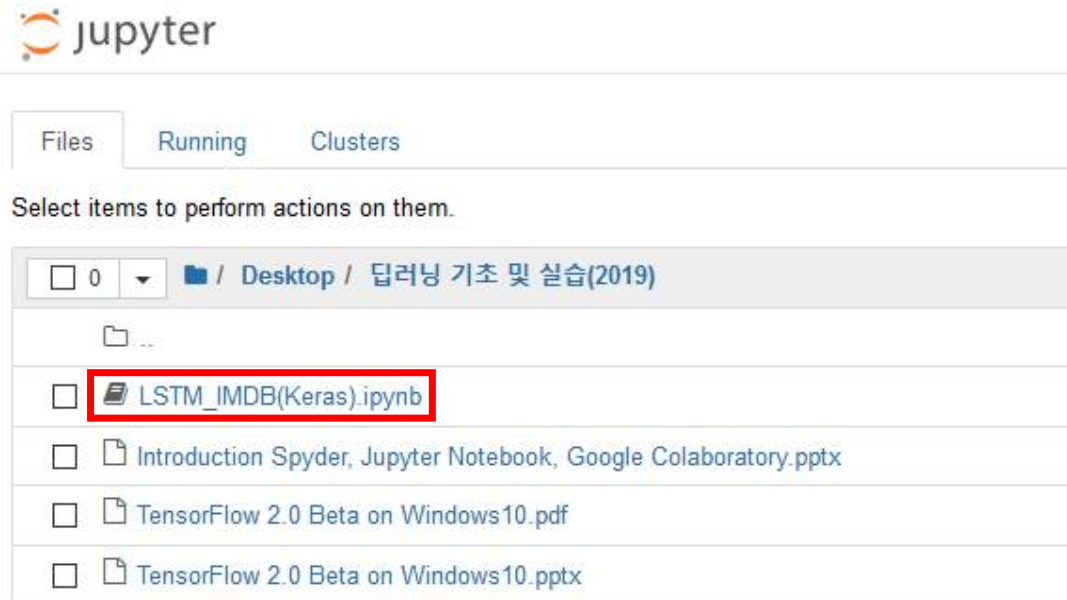
Step 3. Run Code (1)



줄 당(In [1], In [2], ...) 실행 시 : Run 버튼 누르기 or Ctrl + Enter
줄 당(In [1], In [2], ...) 실행 후 다음 줄 만들기 : Alt + Enter

Step 3. Run Code (2)

Jupyter Notebook 파일(ipynb) 실행



Step 3. Run Code (2)

```
jupyter LSTM_IMDB(Keras) (unsaved changes)
File Edit View Insert Cell Kernel Help Not Trusted Python 3

In [0]: import tensorflow as tf

1. Data

In [0]: (X_train, y_train), (X_test, y_test) = tf.keras.datasets.imdb.load_data(num_words=20000)

# 모든 단어는 사용하기엔 학습이 어려워지므로, num_words를 통해 단어의 최대 인덱스를 정해서 나타낼 수 있음, (index / 0 : padding, 1 : 문

In [15]: print(X_train.shape)
print("- Training Data Length -")
print(len(X_train[0]), len(X_train[1]), len(X_train[2]), "...", len(X_train[24999]))

(25000,)
- Training Data Length -
218 189 141 ... 153

- Data Visualization -

In [16]: word_index = tf.keras.datasets.imdb.get_word_index()
reverse_word_index = dict([(value, key) for (key, value) in word_index.items()])
decoded_review = [reverse_word_index.get(i-3, ' ') for i in X_train[0]]

print('- decoded training data 1 -')
for i in range(len(decoded_review)):
    if i%50==0:
        print("")
    print(decoded_review[i], end=' ')

- decoded training data 1 -

this film was just brilliant casting location scenery story direction everyone's really suited the part they played and y
ou could just imagine being there robert is an amazing actor and now the same being director father came from the same
scottish island as myself so i loved
the fact there was a real connection with this film the witty remarks throughout the film were great it was just brilliant
so much that i bought the film as soon as it was released for retail and would recommend it to everyone to watch and the fl
y fishing was
amazing really cried at the end it was so sad and you know what they say if you cry at a film it must have been good and th
is definitely was also congratulations to the two little boy's that played the of norman and paul they were just brillian
t
children are often left out of the praising list i think because the stars that play them all grown up are such a big profil
e for the whole film but these children are amazing and should be praised for what they have done don't you think the whol
e story was
```

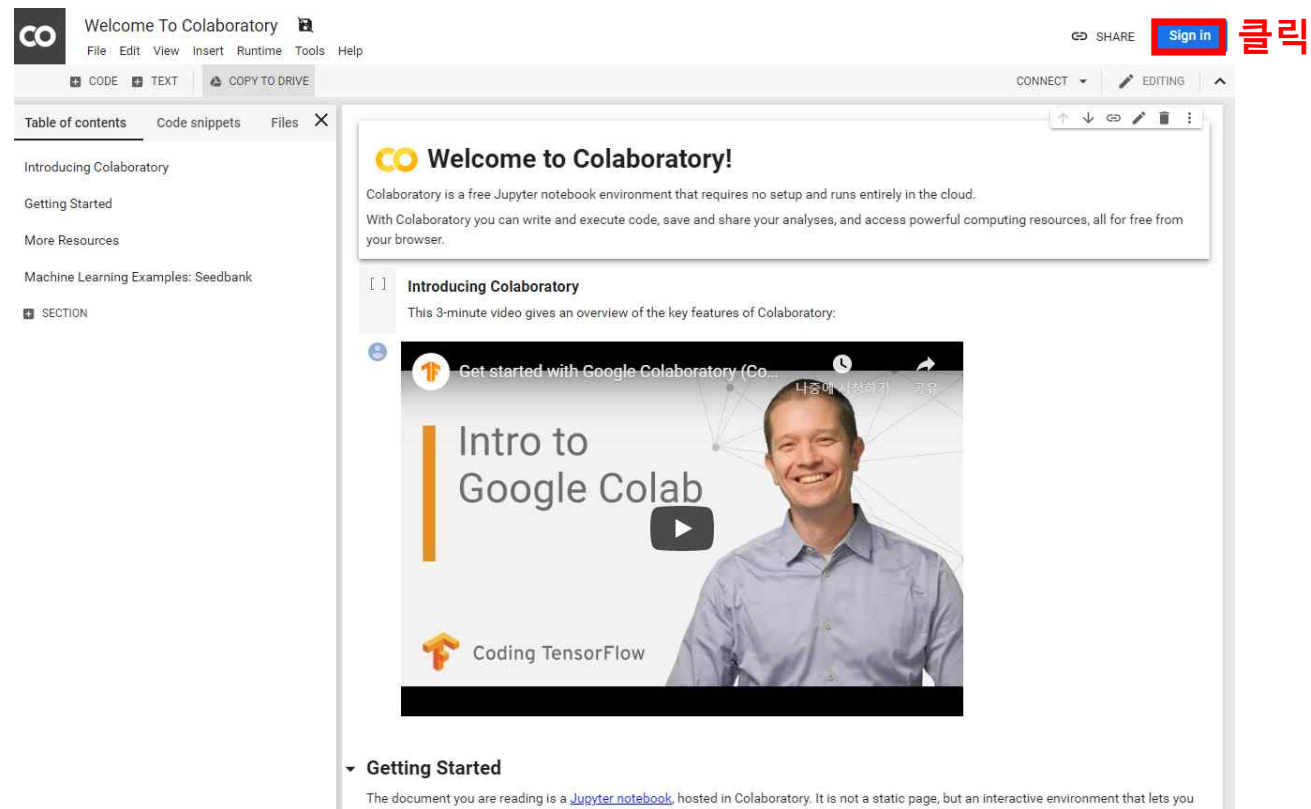
**‘.ipynb’ 파일을 통해
코드 및 실행 결과를 확인할 수 있음**

3. Google Colaboratory

Step 1. Run Google Colaboratory

<https://colab.research.google.com/>

Chrome을 통한 접속 권장



CO Welcome To Colaboratory

File Edit View Insert Runtime Tools Help

CODE TEXT COPY TO DRIVE

CONNECT EDITING

Table of contents Code snippets Files

Introducing Colaboratory

Getting Started

More Resources

Machine Learning Examples: Seedbank

SECTION

CO Welcome to Colaboratory!

Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud. With Colaboratory you can write and execute code, save and share your analyses, and access powerful computing resources, all for free from your browser.

Introducing Colaboratory

This 3-minute video gives an overview of the key features of Colaboratory:

Get started with Google Colaboratory (Co...)

Intro to Google Colab

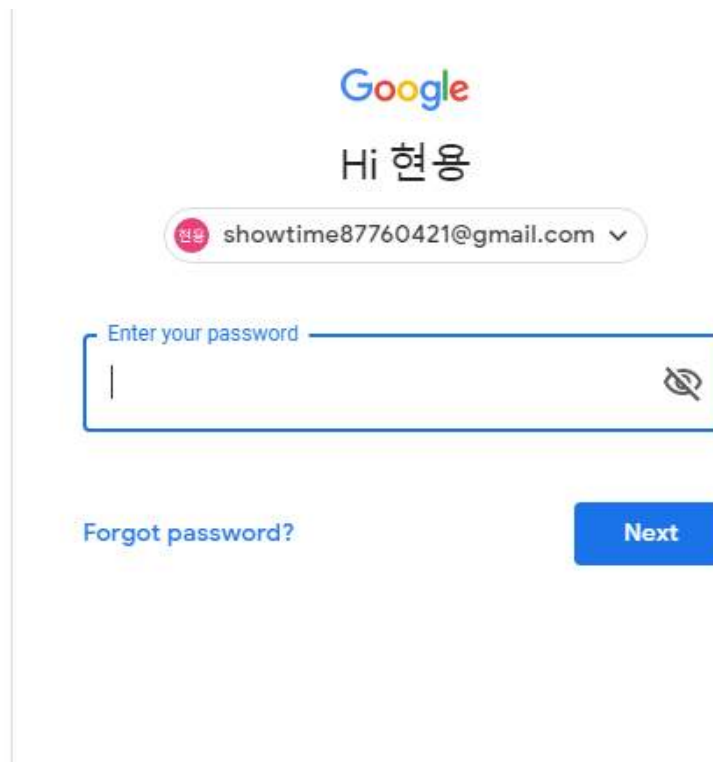
Coding TensorFlow

Getting Started

The document you are reading is a [Jupyter notebook](#), hosted in Colaboratory. It is not a static page, but an interactive environment that lets you

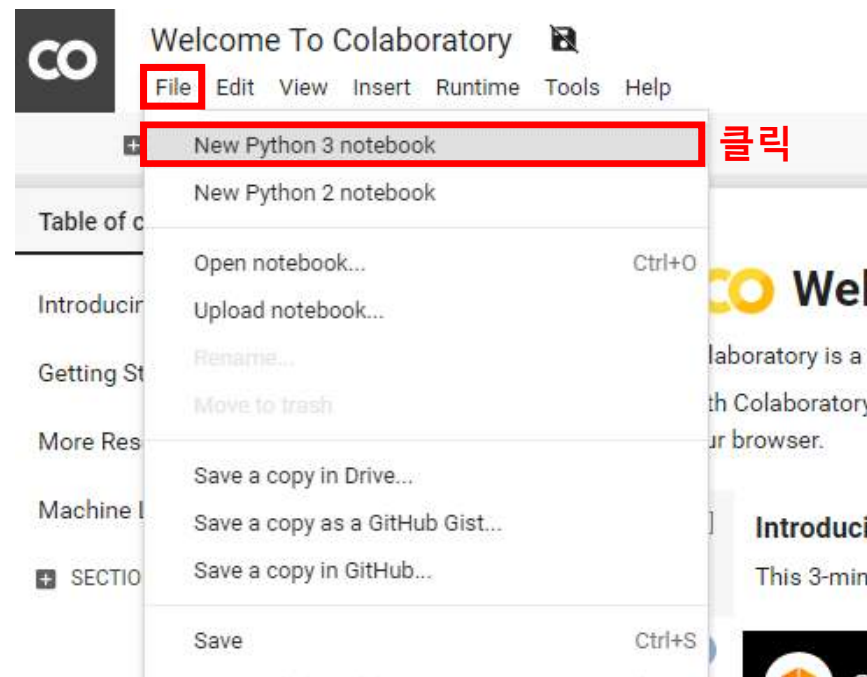
Step 1. Run Google Colaboratory

Google 계정을 통한 로그인 진행



The image shows a Google login interface. At the top is the Google logo. Below it, the text "Hi 현용" (Hi Hyun-yong) is displayed. Underneath is a dropdown menu showing the email address "showtime87760421@gmail.com" with a small red circle containing the Korean character "현용" (Hyun-yong) to its left. Below the email field is a password input field with the placeholder text "Enter your password". To the right of the password field is an eye icon. At the bottom left is a link that says "Forgot password?". At the bottom right is a blue button labeled "Next".

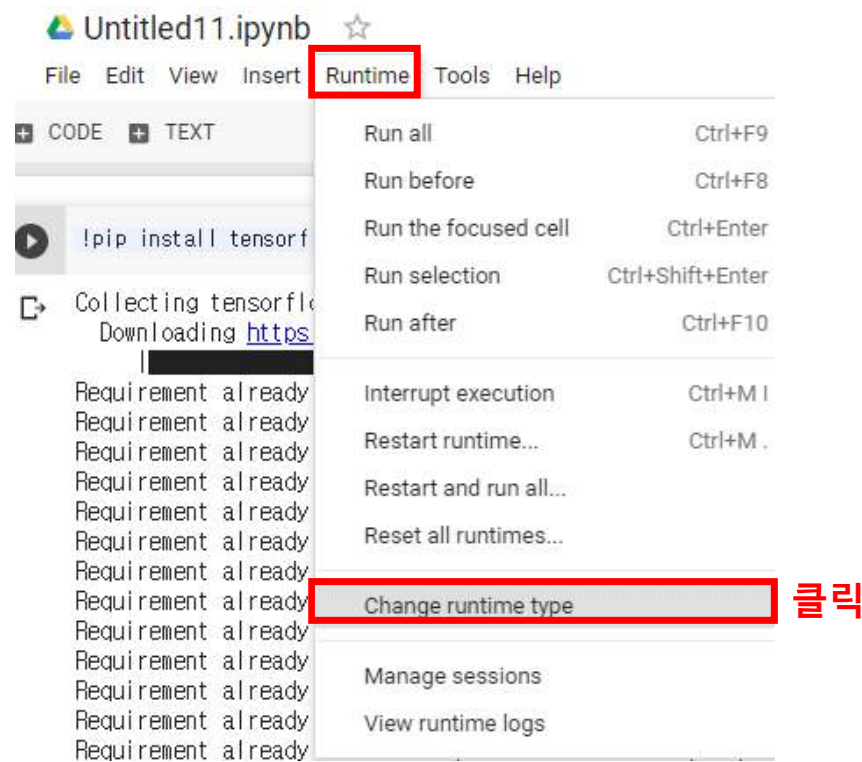
Step 1. Run Google Colaboratory



Step 1. Run Google Colaboratory



Step 2. Setting Google Colaboratory



Step 2. Setting Google Colaboratory

Notebook settings

Runtime type
Python 3

Hardware accelerator
None

☐ Omit code cell output

None ?

GPU

TPU

CANCEL

SAVE

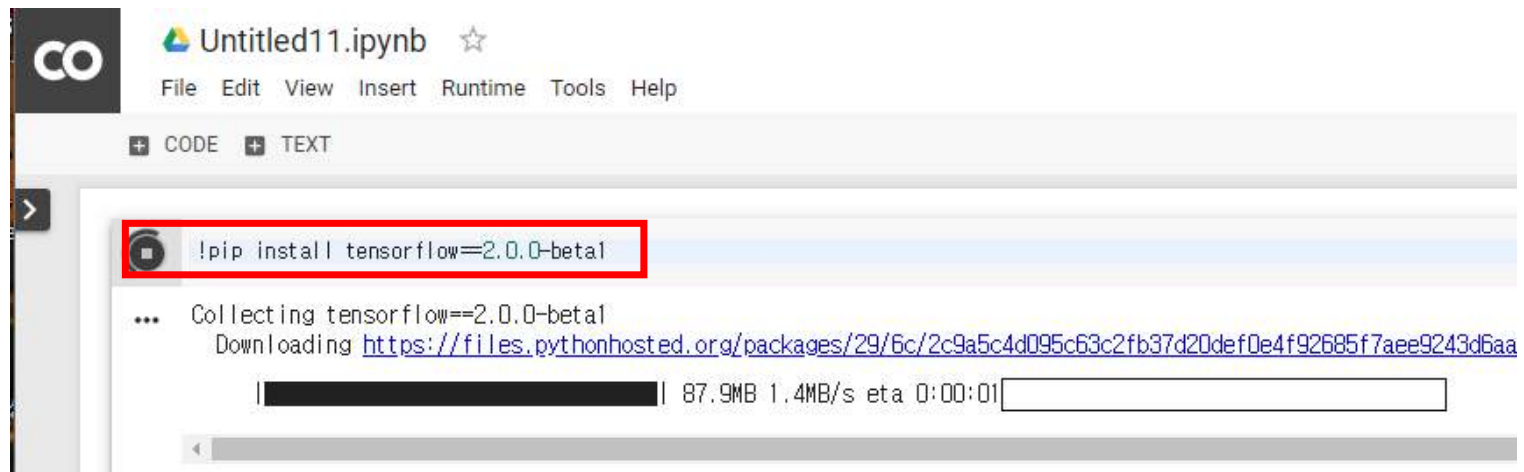


**Hardware Accelerator – GPU or TPU 를 통하여 빠른 학습 진행 가능
(실습 코드는 GPU로 진행하였음)**

**Google Colaboratory GPU
- Tesla K80**

Step 3. Run Code

Google Colaboratory는 TensorFlow 1.14 버전을 사용하므로,
TensorFlow 2.0 코드를 실행하기 위해선 아래와 같이 설치를 진행해야 함

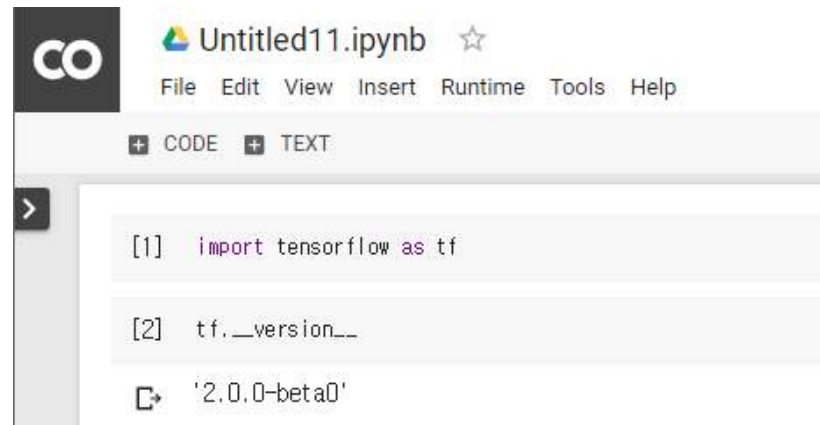


The screenshot shows the Google Colaboratory web interface. At the top, there's a header with the 'CO' logo and the file name 'Untitled11.ipynb'. Below the header is a menu bar with 'File', 'Edit', 'View', 'Insert', 'Runtime', 'Tools', and 'Help'. Underneath the menu bar are tabs for '+ CODE' and '+ TEXT'. The main area displays a code cell with a red border around the input field containing the command `!pip install tensorflow==2.0.0-beta1`. Below the code cell, the output shows the installation progress: 'Collecting tensorflow==2.0.0-beta1', 'Downloading <https://files.pythonhosted.org/packages/29/6c/2c9a5c4d095c63c2fb37d20def0e4f92685f7aee9243d6aa>', and a progress bar indicating '87.9MB 1.4MB/s eta 0:00:01'.

```
!pip install tensorflow==2.0.0-beta1
```

... Collecting tensorflow==2.0.0-beta1
Downloading <https://files.pythonhosted.org/packages/29/6c/2c9a5c4d095c63c2fb37d20def0e4f92685f7aee9243d6aa>
| 87.9MB 1.4MB/s eta 0:00:01

Step 3. Run Code

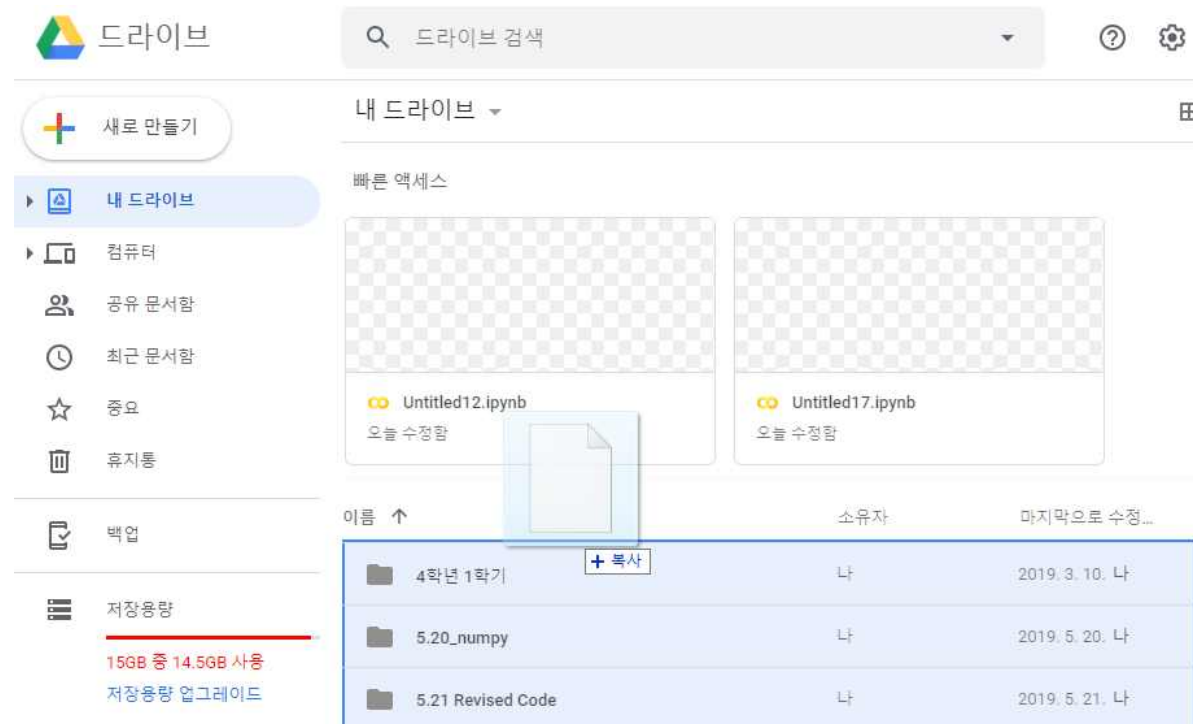


코드 실행 방법은 Jupyter Notebook과 동일

Step 4. Load ipynb file












Google Drive

<https://drive.google.com/drive/my-drive>




본인 계정의 Google Drive에 '.ipynb' 파일 업로드
(Google 계정 로그인 필요)

Step 4. Load ipynb file

	klab-02-1-linear_regression.ipynb	나	2019. 7. 21. 나
	klab-09-2-xor-nn.ipynb	나	오후 9:21 나
	LSTM_Test.ipynb 	나	2019. 5. 14. 나
	Matched_Filter_Not_Noise.m	나	2018. 11. 26. 나
	Matched_Filter_Using_Noise_Sum.m	나	2018. 11. 26. 나
	Matched_Filter_Using_Noise.m	나	2018. 11. 26. 나
	Matched_Filter_Using_Noise2.m	나	2018. 11. 26. 나
	Matched_Filter_Using_Noise3.m	나	2018. 11. 26. 나
	NVIDIA Tegra X2 교육용 필수서류.zip	나	
	openpose.zip	나	

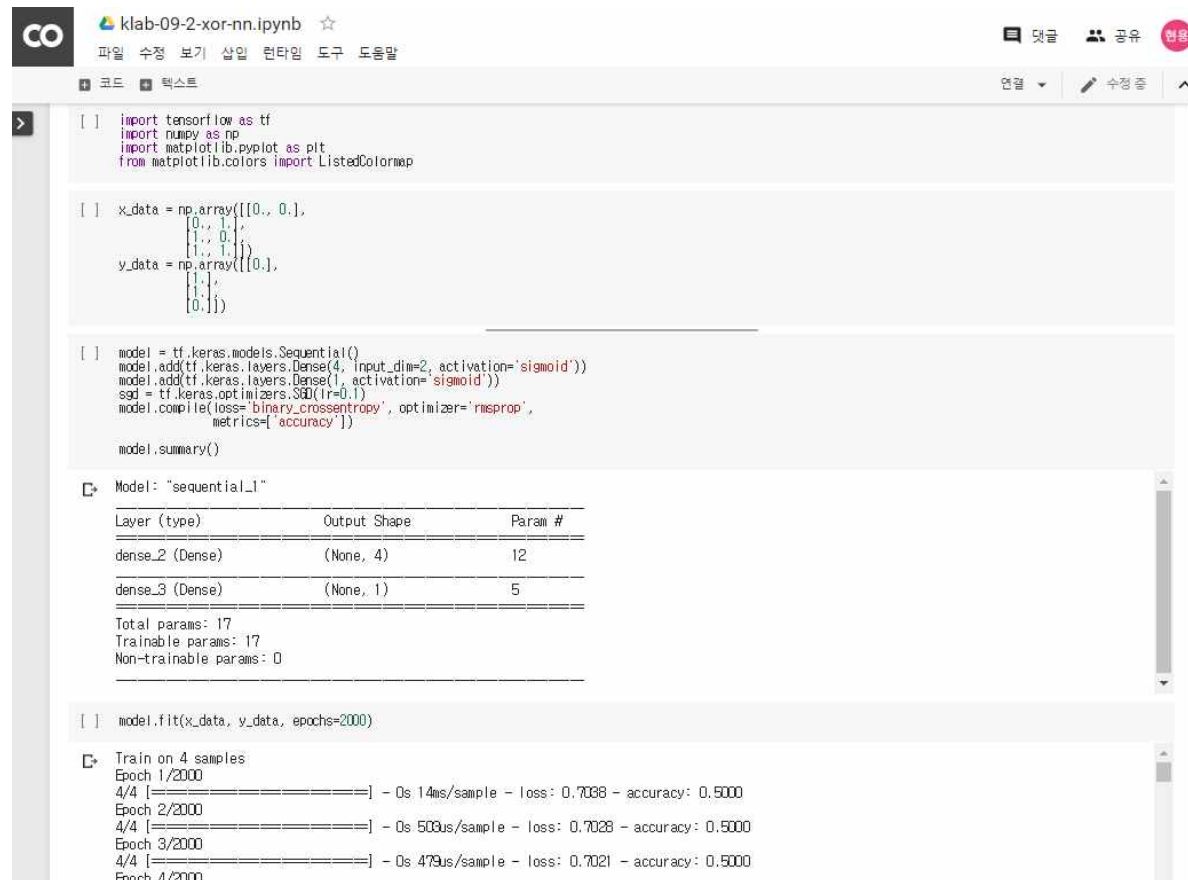
업로드 후 '.ipynb' 파일 실행

업로드 1개 완료

 klab-09-2-xor-nn.ipynb



Step 4. Load ipynb file



The screenshot displays a JupyterLab environment with a notebook titled "klab-09-2-xor-nn.ipynb". The interface includes a top bar with a file manager, search, and other tools. The notebook content is as follows:

```
[ ] import tensorflow as tf
import numpy as np
import matplotlib.pyplot as plt
from matplotlib.colors import ListedColorMap

[ ] x_data = np.array([[0., 0.],
                      [0., 1.],
                      [1., 0.],
                      [1., 1.]])
y_data = np.array([[0.],
                   [1.],
                   [1.],
                   [0.]])

[ ] model = tf.keras.models.Sequential()
model.add(tf.keras.layers.Dense(4, input_dim=2, activation='sigmoid'))
model.add(tf.keras.layers.Dense(1, activation='sigmoid'))
sgd = tf.keras.optimizers.SGD(lr=0.1)
model.compile(loss='binary_crossentropy', optimizer='rmsprop',
              metrics=['accuracy'])

model.summary()
```

The output of the `model.summary()` command is shown below:

Model: "sequential_1"

Layer (type)	Output Shape	Param #
dense_2 (Dense)	(None, 4)	12
dense_3 (Dense)	(None, 1)	5

Total params: 17
Trainable params: 17
Non-trainable params: 0

```
[ ] model.fit(x_data, y_data, epochs=2000)
```

The output of the `model.fit` command is shown below:

Train on 4 samples

Epoch 1/2000
4/4 [=====] - 0s 14ms/sample - loss: 0.7038 - accuracy: 0.5000

Epoch 2/2000
4/4 [=====] - 0s 500us/sample - loss: 0.7028 - accuracy: 0.5000

Epoch 3/2000
4/4 [=====] - 0s 479us/sample - loss: 0.7021 - accuracy: 0.5000

Epoch 4/2000

해당 페이지에서 코드 실행 및 수정 가능

End