

Google - Colaboratory

● Colab 장점



- Jupyter Notebook과 사용법 동일
- 다른 사용자와 공유, 연구 및 교육용
- 분석 관련 패키지 사용
- 딥러닝 관련 라이브러리 포함
- GPU, TPU 사용 가능
- Google drive(15GB)와 연동 가능

- Google, 07/11/2019, <https://colab.research.google.com>

● URL 접속 : Gmail 계정 필요

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

The screenshot shows the Google Colaboratory (Colab) web interface. The browser address bar displays the URL `colab.research.google.com/notebooks/intro.ipynb#scrollTo=GJBs_flRovLc`. The page header includes the Colab logo and the text "Colaboratory에 오신 것을 ...". Below the header, there are tabs for "파일", "수정", "보기", "삽입", "런타임", "도구", and "도움말". The left sidebar shows a "목차" (Table of Contents) with items like "시작하기", "데이터 과학", "머신러닝", "추가 리소스", and "머신러닝 예제". The main content area is titled "시작하기" (Getting Started) and contains text explaining that the page is for learning and practicing code. It includes a code cell with the following Python code:

```
[ ] 1 seconds_in_a_day = 24 * 60 * 60
    2 seconds_in_a_day
```

Below the code cell, there is a user profile icon and the text "86400". The text continues: "위 셀의 코드를 실행하려면 셀을 클릭하고 Enter 키를 누릅니다. 또는 코드 수정을 바로 시작할 수 있습니다. 특정 셀에서 정의한 변수를 나중..."

A large, semi-transparent dialog box is overlaid on the center of the screen, titled "Google 로그인 필요" (Google login required). The text inside the dialog box says: "계속하려면 Google 계정에 로그인해야 합니다." (To continue, you must log in to your Google account.). There is a blue "확인" (Confirm) button at the bottom right of the dialog box. A blue speech bubble with the text "Google login" is also visible in the upper right corner of the dialog box.

● 새노트 작성



The screenshot shows the Colaboratory web interface. The top navigation bar includes the Colaboratory logo and the text "Colaboratory에 오신 것을 ...". Below this is a menu bar with options: "파일" (File), "수정" (Edit), "보기" (View), "삽입" (Insert), "런타임" (Runtime), "도구" (Tools), and "도움말" (Help). The "파일" menu is open, displaying a list of actions. The first item, "새 노트" (New Notebook), is highlighted with a red rectangular box. Other items in the menu include "노트 열기" (Open Notebook) with a keyboard shortcut "Ctrl+O", "노트 업로드" (Upload Notebook), "노트 이름 변경" (Rename Notebook), "휴지통으로 이동" (Move to Trash), "드라이브에 사본 저장" (Save as Copy to Drive), "GitHub Gist로 사본 저장" (Save as Copy to GitHub Gist), "GitHub에 사본 저장" (Save as Copy to GitHub), "저장" (Save) with "Ctrl+S", "버전 저장 및 고정" (Save Version and Pin) with "Ctrl+M S", "업데이트 기록" (Update History), ".ipynb 다운로드" (Download .ipynb), and ".py 다운로드" (Download .py).

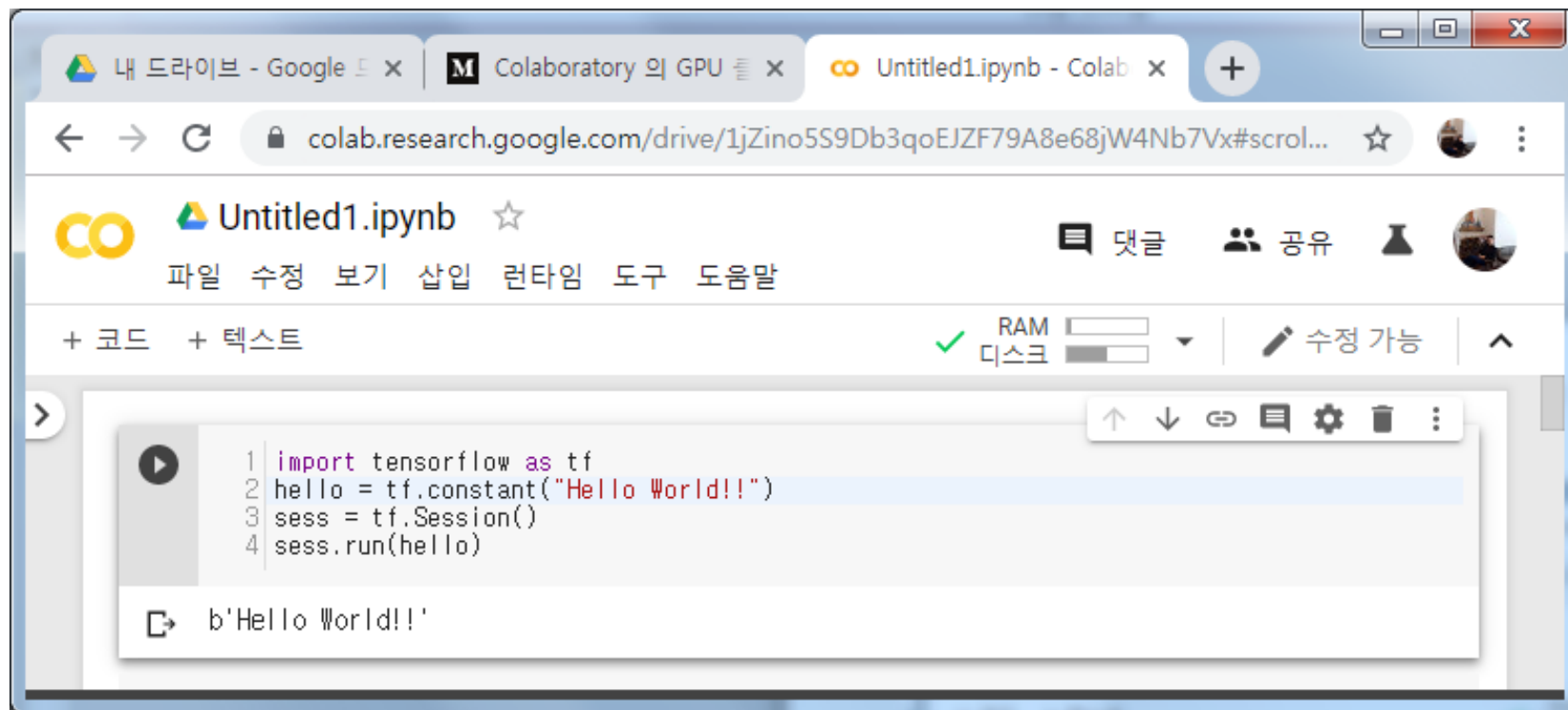
The main content area on the right shows a code editor with the title "시작하기" (Getting Started). It contains text explaining that the document is for writing and running code, followed by a code cell with the following Python code:

```
[ ] 1 seconds_in_a_day = 24 * 60 * 60
    2 seconds_in_a_day
```

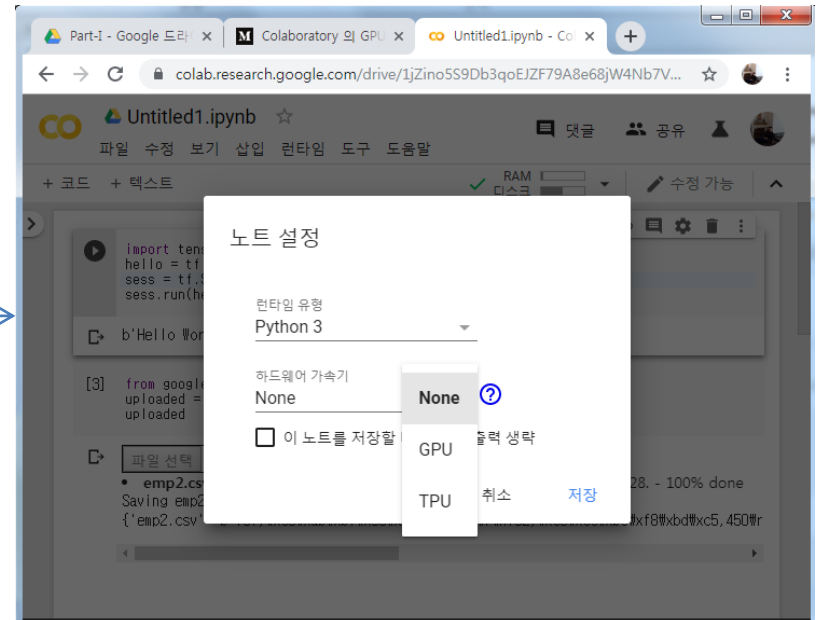
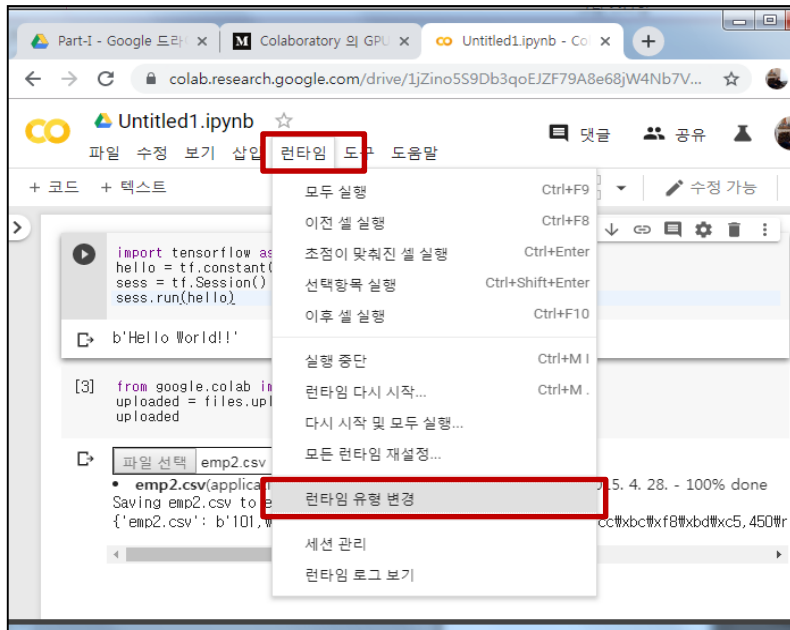
The output of the code cell is displayed as "86400". Below the code cell, there is text explaining that clicking a cell to run it will execute the code on the left and allow for immediate editing. It also mentions that variables defined in one cell can be used in subsequent cells. At the bottom, another code cell is partially visible with the following code:

```
[ ] 1 seconds_in_a_week = 7 * seconds_in_a_day
```

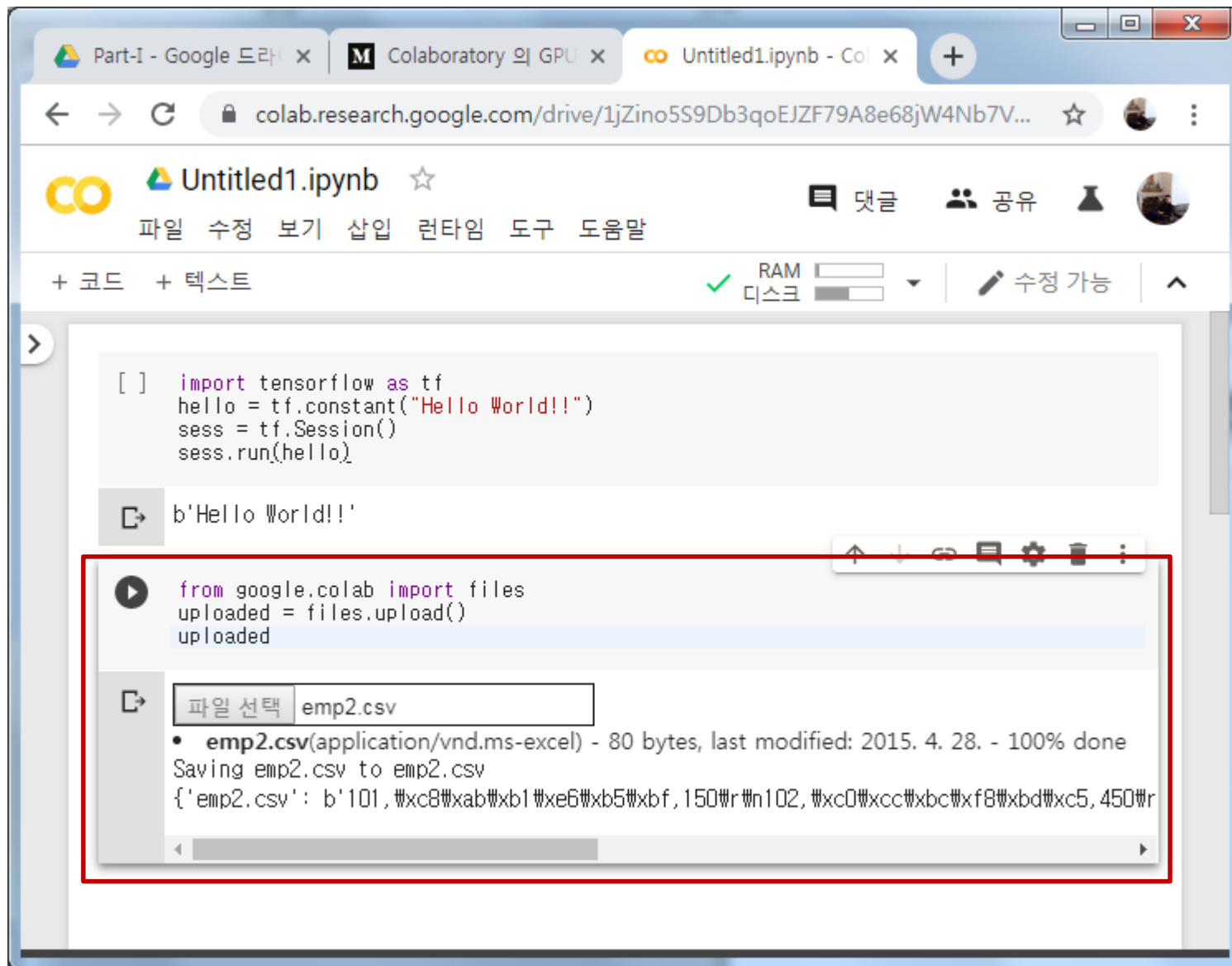
● Tensorflow 사용



● 가속기 : GPU/TPU 사용



● Local file load



The screenshot displays the Google Colaboratory web interface. The browser tabs include 'Part-I - Google 드라...', 'Colaboratory 의 GPU', and 'Untitled1.ipynb - Col'. The address bar shows the URL 'colab.research.google.com/drive/1jZino5S9Db3qoEJZF79A8e68jW4Nb7V...'. The notebook title is 'Untitled1.ipynb'. The interface includes a toolbar with options like '파일' (File), '수정' (Edit), '보기' (View), '삽입' (Insert), '런타임' (Runtime), '도구' (Tools), and '도움말' (Help). A status bar at the top right shows 'RAM 디스크' (RAM Disk) usage and a '수정 가능' (Editable) status.

The notebook content shows a code cell with the following Python code:

```
[ ] import tensorflow as tf
hello = tf.constant("Hello World!!")
sess = tf.Session()
sess.run(hello)
```

The output of this cell is 'b'Hello World!!''. Below this, a second code cell is highlighted with a red box. It contains the following code:

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

The output of this cell shows a file selection dialog with 'emp2.csv' selected. Below the dialog, the following information is displayed:

- **emp2.csv**(application/vnd.ms-excel) - 80 bytes, last modified: 2015. 4. 28. - 100% done

Saving emp2.csv to emp2.csv

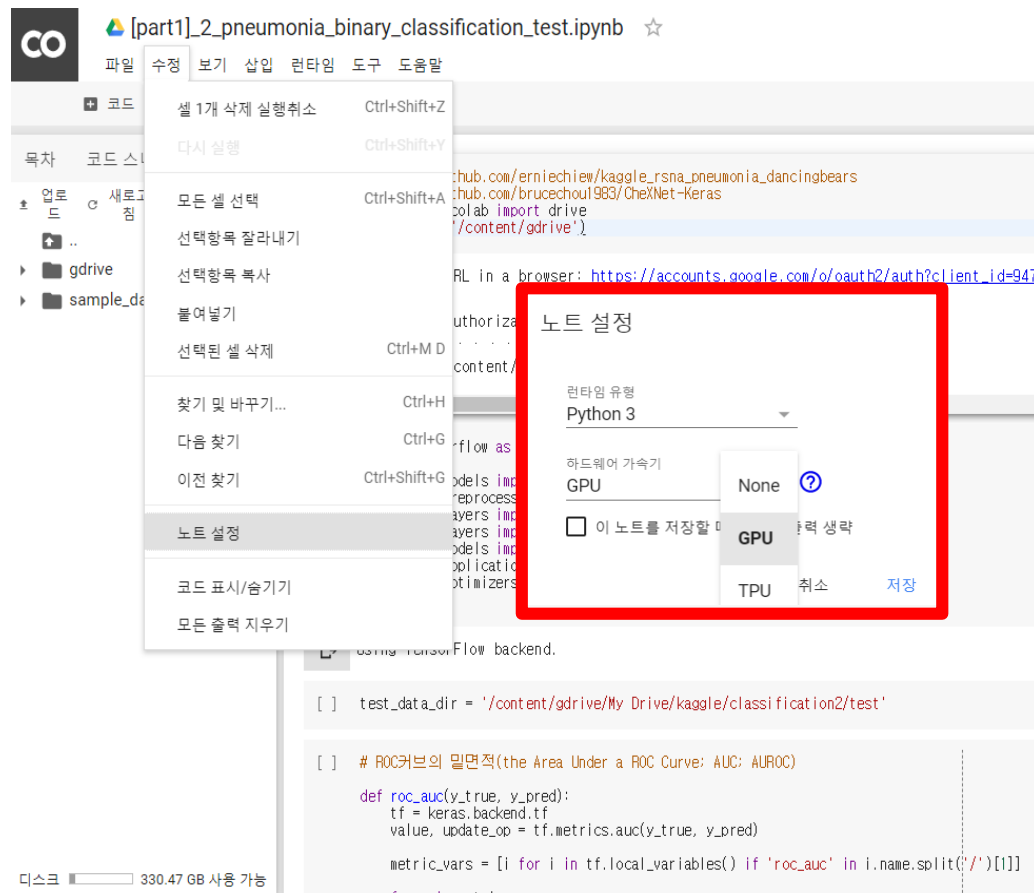
```
{'emp2.csv': b'101, #xc8#xab#xb1 #xe6#xb5#xbf, 150#r#n102, #xc0#xcc#xbc#xf8#xbd#xc5, 450#r'}
```

● Google Drive 공유

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

The screenshot displays the Google Drive web interface. The address bar shows the URL <https://drive.google.com/drive/my-drive>. The left sidebar contains navigation options: '새로 만들기' (New), '내 드라이브' (My Drive), '공유 문서함' (Shared with me), '최근 문서함' (Recent), '중요' (Important), '휴지통' (Trash), '백업' (Backup), and '저장용량' (Storage) which indicates 15GB of 16GB is used. The main area shows a folder named 'Part-I' containing several files: 'emp.csv', 'emp.txt', 'emp2.csv', 'excel.csv', 'html_cont.csv', 'quakes_df.csv', 'sam_kospi.xlsx', 'st.csv', 'st.xlsx', and 'st1.txt'. A Windows Backup and Sync download notification is visible in the bottom left. The bottom of the browser shows open tabs for '제4장 연습문제.R', 'chap04_function.txt', and 'chap04_operator.txt'.

● Google Drive file load



[part1]_2_pneumonia_binary_classification_test.ipynb

파일 수정 보기 삽입 런타임 도구 도움말

코드

셀 1개 삭제 실행취소 Ctrl+Shift+Z

다시 실행 Ctrl+Shift+Y

모든 셀 선택 Ctrl+Shift+A

선택항목 잘라내기

선택항목 복사

붙여넣기

선택된 셀 삭제 Ctrl+M D

찾기 및 바꾸기... Ctrl+H

다음 찾기 Ctrl+G

이전 찾기 Ctrl+Shift+G

노트 설정

코드 표시/숨기기

모든 출력 지우기

노트 설정

런타임 유형 Python 3

하드웨어 가속기 GPU

☐ 이 노트를 저장할 때

None ?

GPU 전력 생략

TPU 취소 저장

```
[ ] test_data_dir = '/content/gdrive/My Drive/kaggle/classification2/test'
```

```
[ ] # ROC커브의 밀면적(the Area Under a ROC Curve: AUC: AUROC)
```

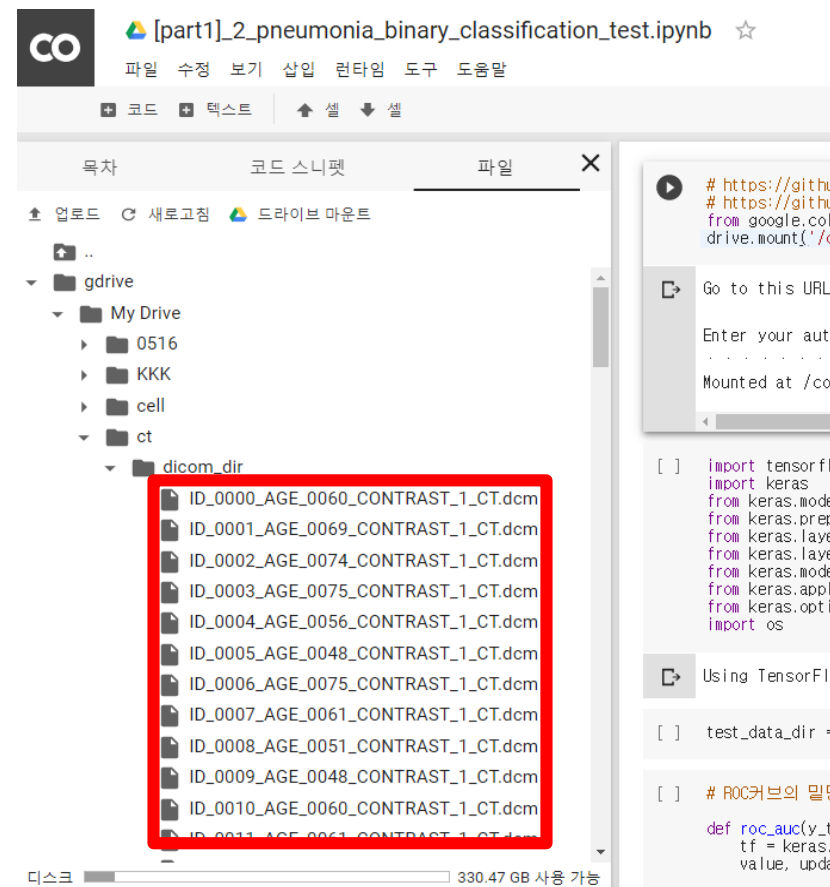
```
def roc_auc(y_true, y_pred):
```

```
    tf = keras.backend.tf
```

```
    value, update_op = tf.metrics.auc(y_true, y_pred)
```

```
    metric_vars = [i for i in tf.local_variables() if 'roc_auc' in i.name.split('/')[1]]
```

디스크 330.47 GB 사용 가능



[part1]_2_pneumonia_binary_classification_test.ipynb

파일 수정 보기 삽입 런타임 도구 도움말

코드 텍스트 셀

목차 코드 스니펫 파일

업로드 새로고침 드라이브 마운트

gdrive

My Drive

0516

KKK

cell

ct

dicom_dir

ID_0000_AGE_0060_CONTRAST_1_CT.dcm

ID_0001_AGE_0069_CONTRAST_1_CT.dcm

ID_0002_AGE_0074_CONTRAST_1_CT.dcm

ID_0003_AGE_0075_CONTRAST_1_CT.dcm

ID_0004_AGE_0056_CONTRAST_1_CT.dcm

ID_0005_AGE_0048_CONTRAST_1_CT.dcm

ID_0006_AGE_0075_CONTRAST_1_CT.dcm

ID_0007_AGE_0061_CONTRAST_1_CT.dcm

ID_0008_AGE_0051_CONTRAST_1_CT.dcm

ID_0009_AGE_0048_CONTRAST_1_CT.dcm

ID_0010_AGE_0060_CONTRAST_1_CT.dcm

ID_0011_AGE_0061_CONTRAST_1_CT.dcm

```
[ ] import tensorflow as tf
```

```
[ ] import keras
```

```
from keras.models import load_model
```

```
from keras.preprocessing import image
```

```
from keras.layers import Dense, Flatten, Conv2D, MaxPooling2D
```

```
from keras.applications import VGG16
```

```
from keras.optimizers import Adam
```

```
import os
```

```
[ ] Using TensorFlow backend.
```

```
[ ] test_data_dir =
```

```
[ ] # ROC커브의 밀면적
```

```
def roc_auc(y_true,
```

```
    tf = keras.
```

```
    value, upd
```

디스크 330.47 GB 사용 가능