CoE202
Fundamentals of Artificial intelligence
<Big Data Analysis and Machine Learning>

How to use Google Colab

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*Colab manual by TA. Jeewon Kim

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- Google Colab
  - What is Google Colab
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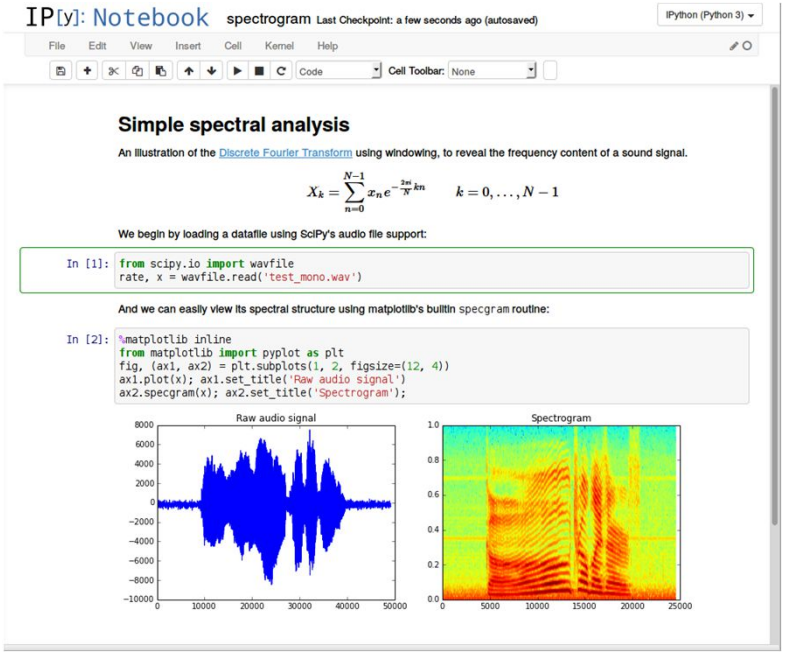
  - Importing mat file

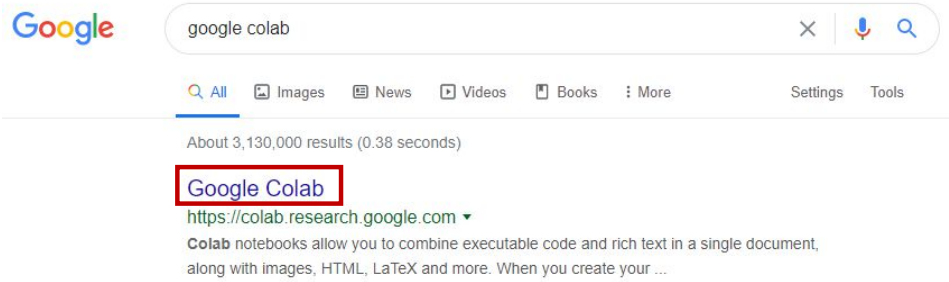
iPython

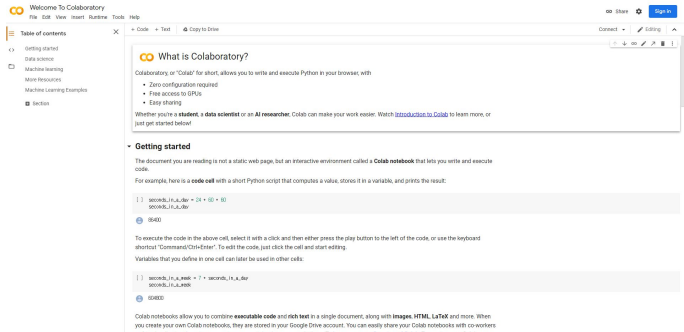
- Interactive Python
- iPython is a command shell for interactive computing
- Browser-based
- Interactive running
- Interactive visualization
- Flexible



What is Google Colaboratory

- Colaboratory, or “Colab” for short, allows you to write and execute Python in your browser
- We will use Google Colab for in-class programming
- Can easily access through google
  - https://colab.research.google.com

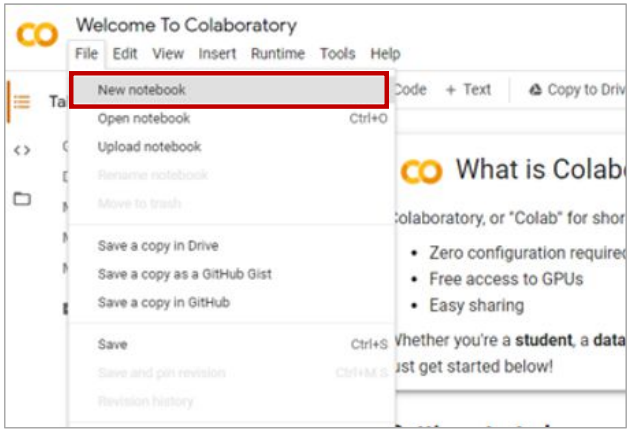


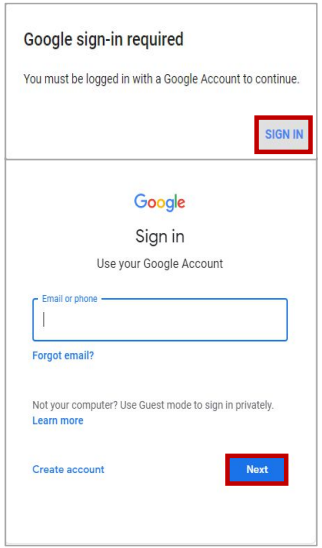


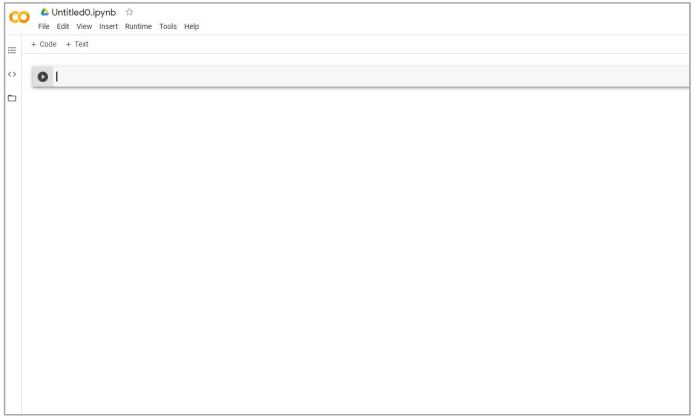
Welcome Page

Open New Notebook

- [File] → [New notebook]
- Sign in Google

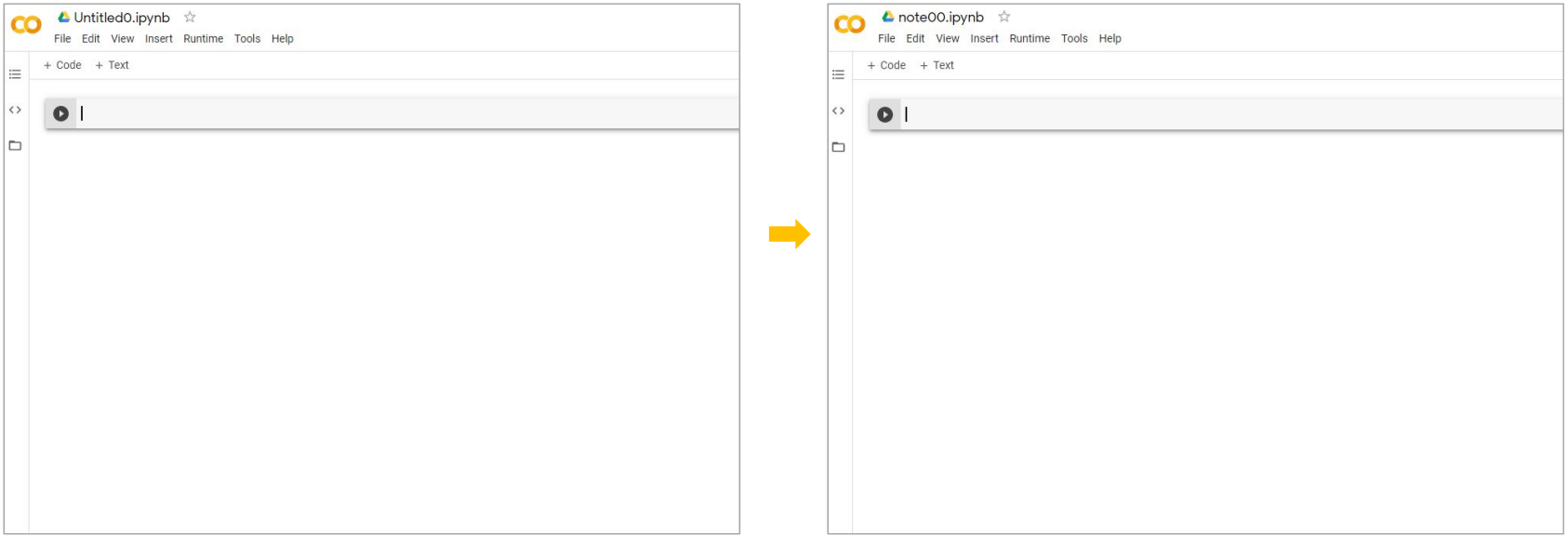






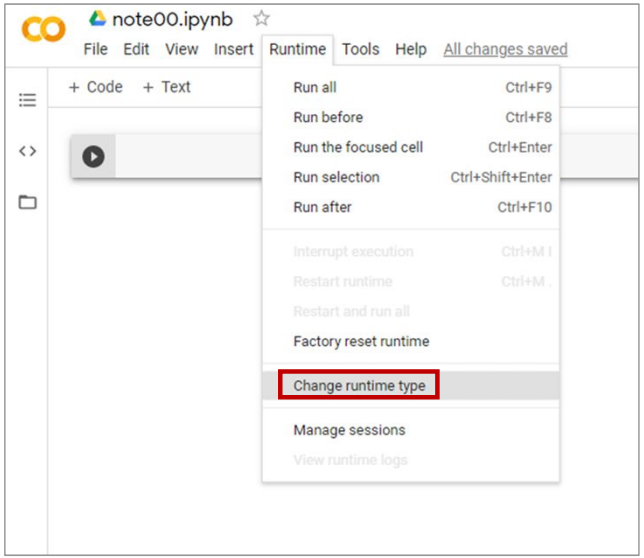
Rename Notebook

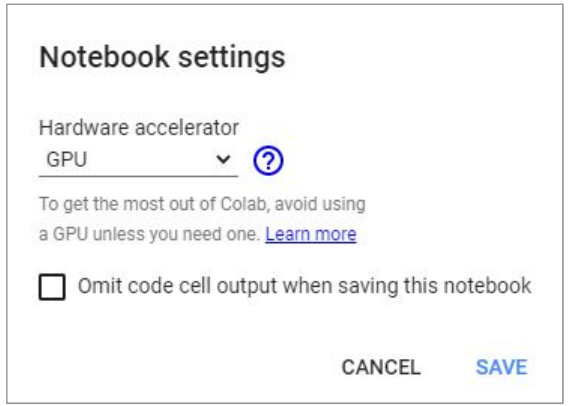
- Left click ‘Untitled0.ipynb’
- Type the name that you want (ex. note00.ipynb)



Change Runtime Type

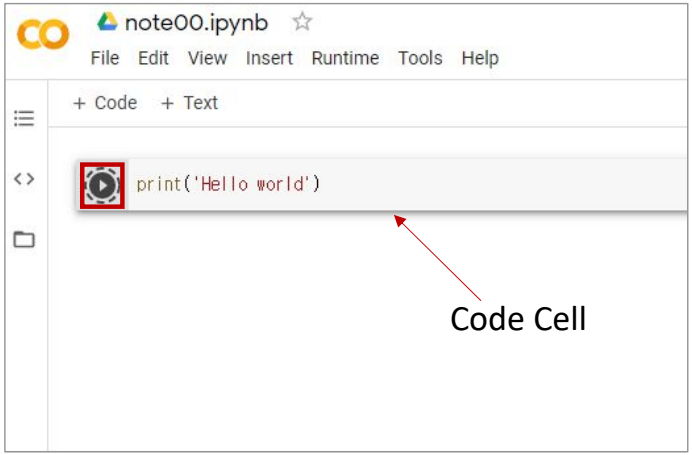
- Change runtime type if you need GPU
- [Runtime] → [Change runtime type]
- Set GPU for Hardware accelerator

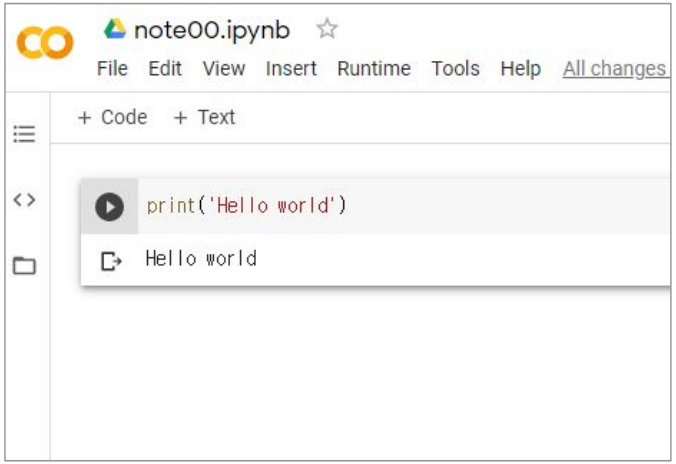




Python Programming in Colab

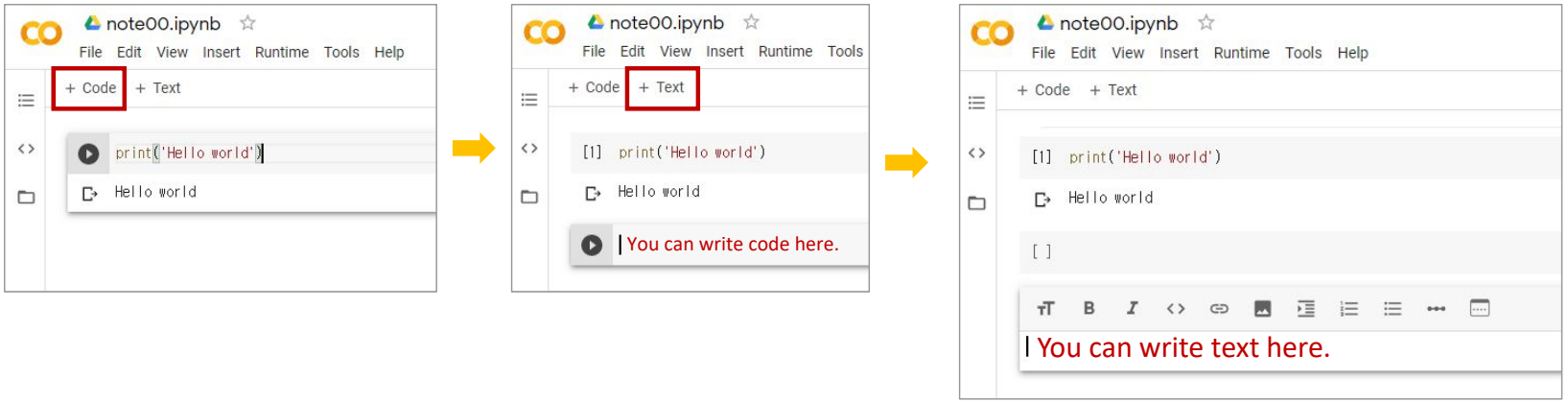
- Click play button on the left part of the code cell
- Short cut: [Crtl] + [Enter] or [Shift] + [Enter]





Python Programming in Colab

- Click [+ Code] on the top to insert a code cell
- Click [+ Text] on the top to insert a text cell

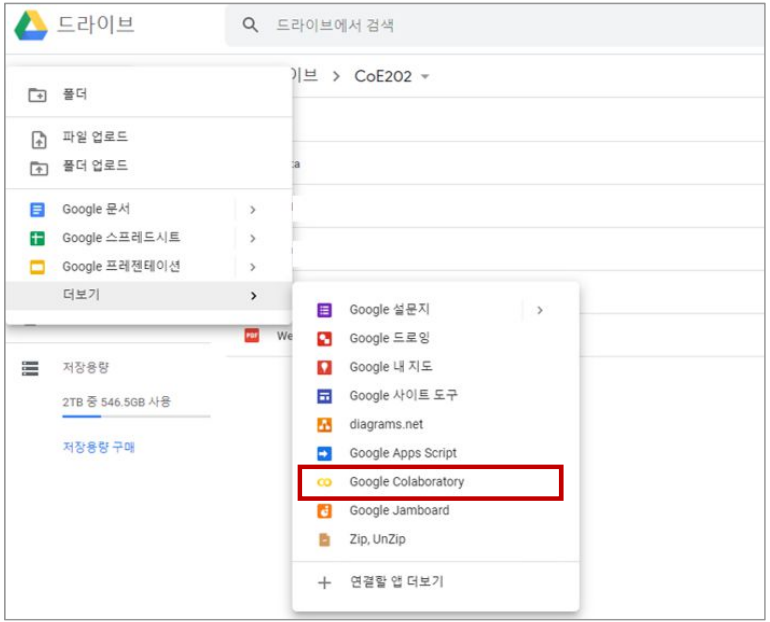


Import .mat data file on Colab

- Download .mat data file from klms and upload it to ‘Google Drive’.
- Here, I made the CoE202 folder in my ‘Google Drive’.
- Inside CoE202 folder, I made a data folder and uploaded a .mat data file.

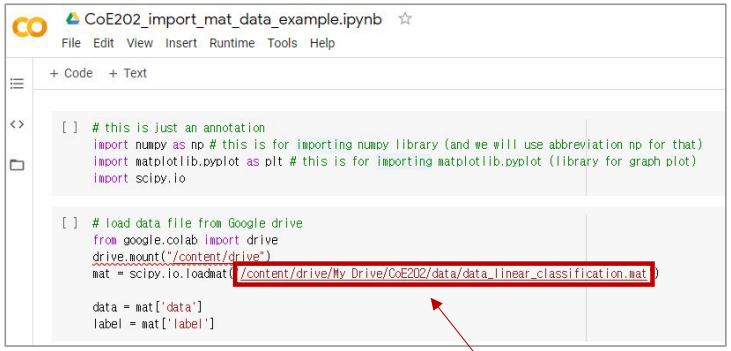
Import .mat data file on Colab

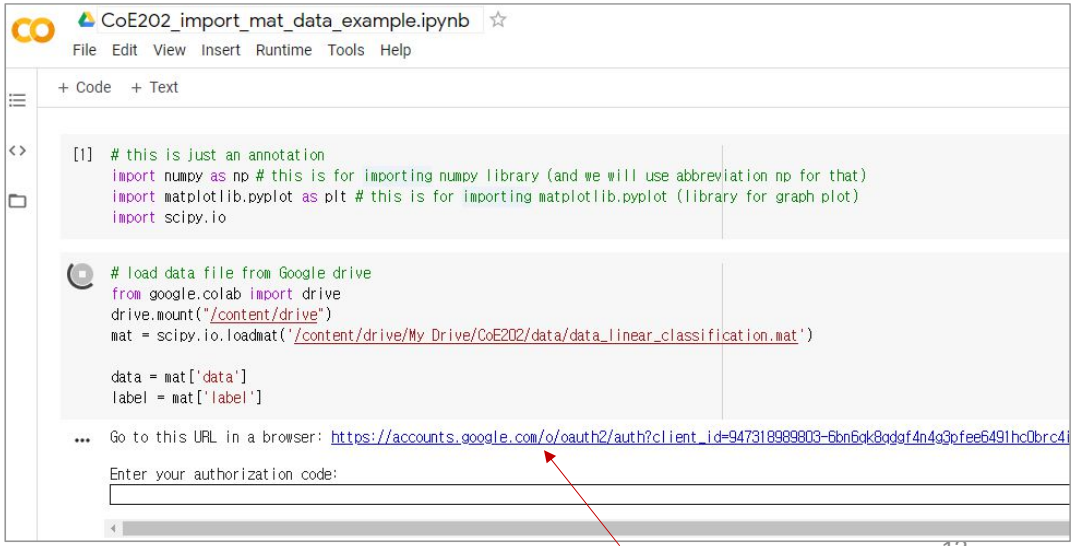
- Click the ‘New’ button and make a new ‘Google Colaboratory’ file.



Import .mat data file on Colab

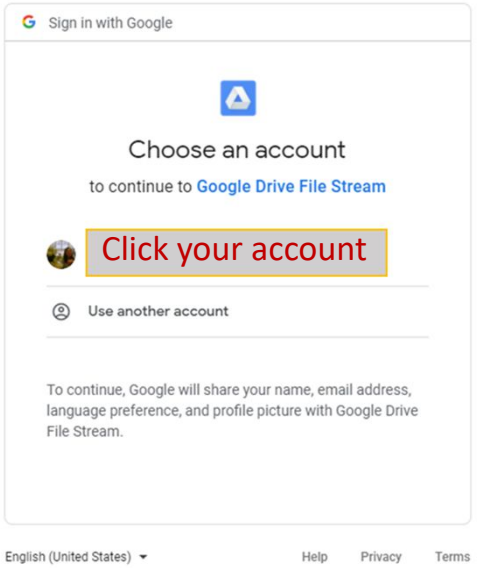
- Write your data path inside the scipy.io.loadmat function.
- Run cells and then you will get URL.
- Click URL.

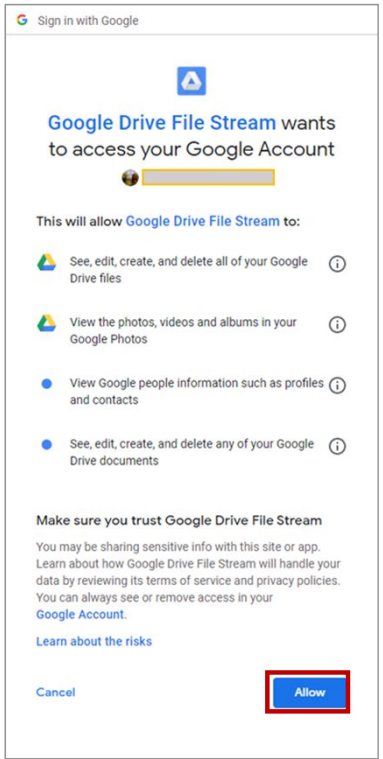


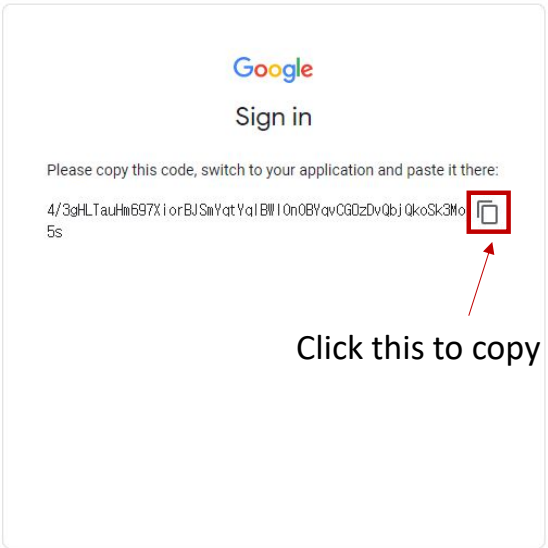


Import .mat data file on Colab

- Click your account → Click Allow → Copy code

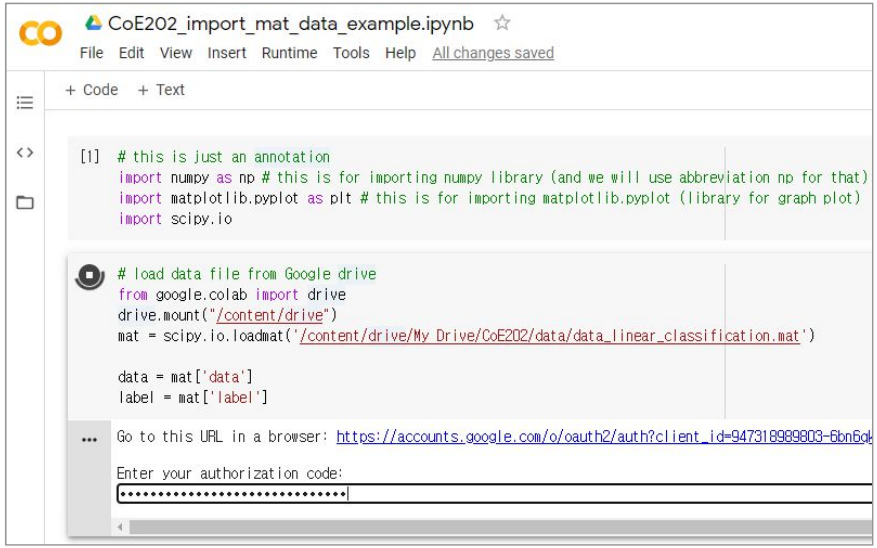


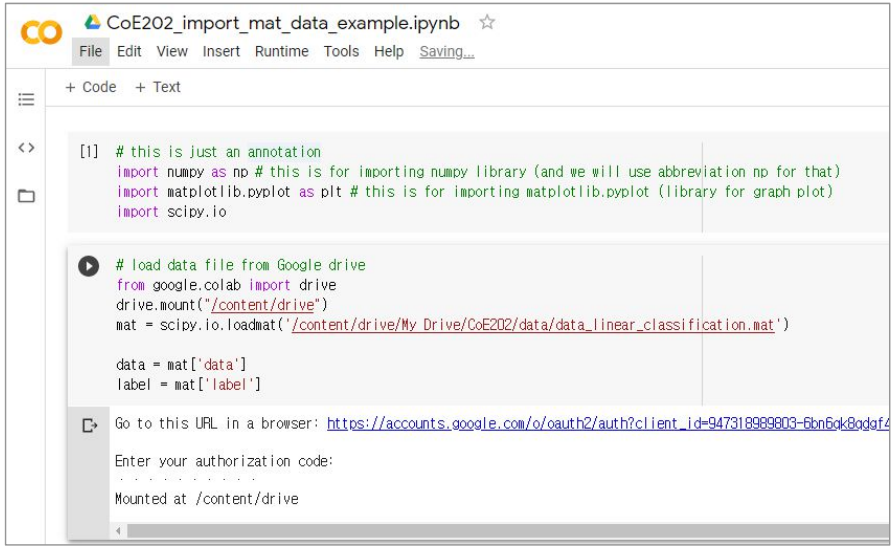




Import .mat data file on Colab

- Go back to the Colab notebook.
- Paste the code and then click Enter.
- You will get 'Mounted at /content/drive’ message.





Import .mat data file on Colab

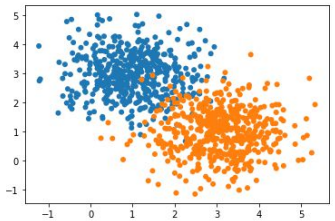
- Now, you can use the data in the Colab as follows.

```
[2] from google.colab import drive
    drive.mount("/content/drive")
    mat = scipy.io.loadmat('/content/drive/My Drive/CoE202/data/data_linear_classification.mat')

    data = mat['data']
    label = mat['label']
```

```
Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=947318989803-6bn6qk8qdgf4n4g3pfee6491hc0brc4i.apps.googleuser

Enter your authorization code:
··········
Mounted at /content/drive
```

```
[3] # define a function to plot data
    def show_data_binary_class(data, label):
        fig, ax = plt.subplots()
        ind = 0
        for color in ['tab:blue', 'tab:orange']:
            current_ind = np.where(label==ind)[1]
            x = data[0,current_ind]
            y = data[1,current_ind]
            ax.scatter(x, y, c=color, edgecolors='none')
            ind +=1
```

```
[4] # show data
    show_data_binary_class(data, label)
```



Summary

- iPython (interactive Python)
- Google Colab is a free, easy-to-use online platform for using iPython
- Google Colab can be used with Google Drive

References

- Jupyter Notebook
  - https://ipython.org/notebook.html

- Google Colab
  - https://colab.research.google.com/