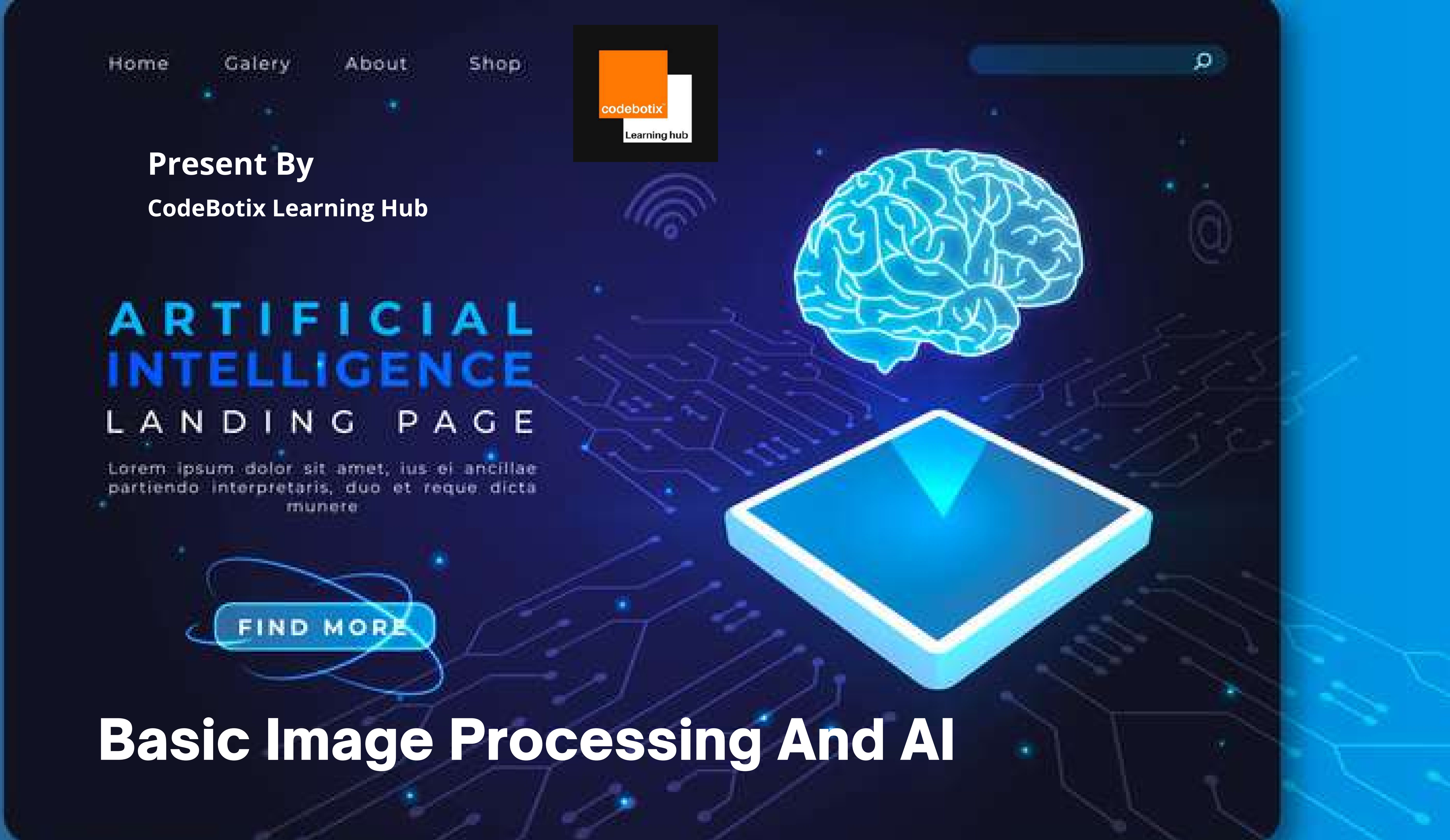
Present By

CodeBotix Learning Hub


Home
Galery
About
Shop
ARTIFICIAL INTELLIGENCE
LANDING PAGE
Lorem ipsum dolor sit amet, ius ei ancillae partiendo interpretaris, duo et reque dicta munere
FIND MORE

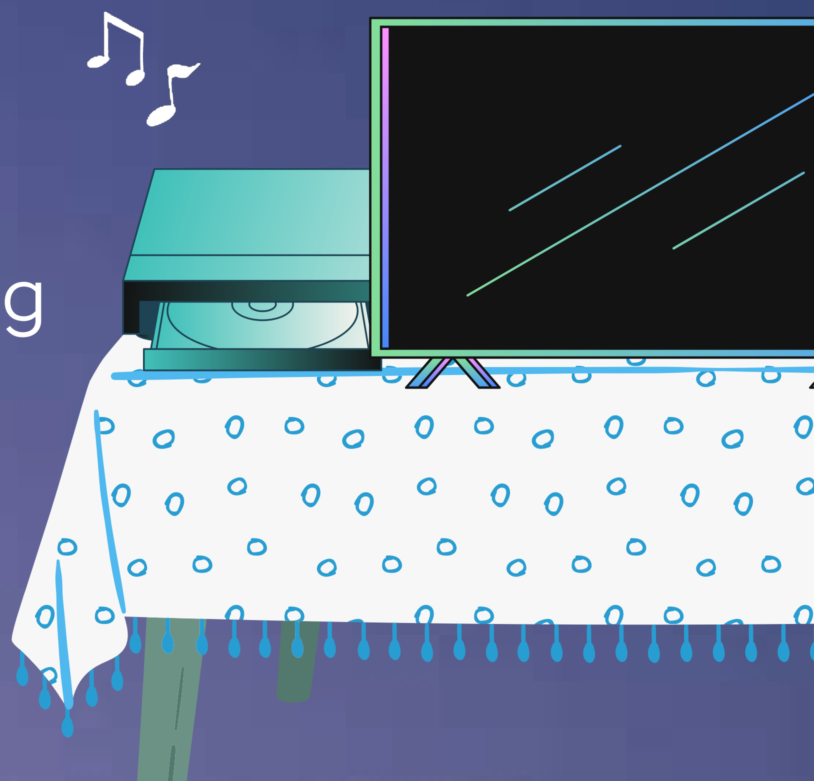
Basic Image Processing And AI

Let's get to know each other first

P' BLUE

Bachelor Computer Engineering

King Mongkut's Institute Of Technology Ladkrabang
(KMITL)



Topic

which we could learning today?

1 OpenCV

2 Mediapipe - - - - - > Mediapipe Holistic (guide line)

" Wisdom comes with age, so just live and learn."

By William Landry

Open-cv

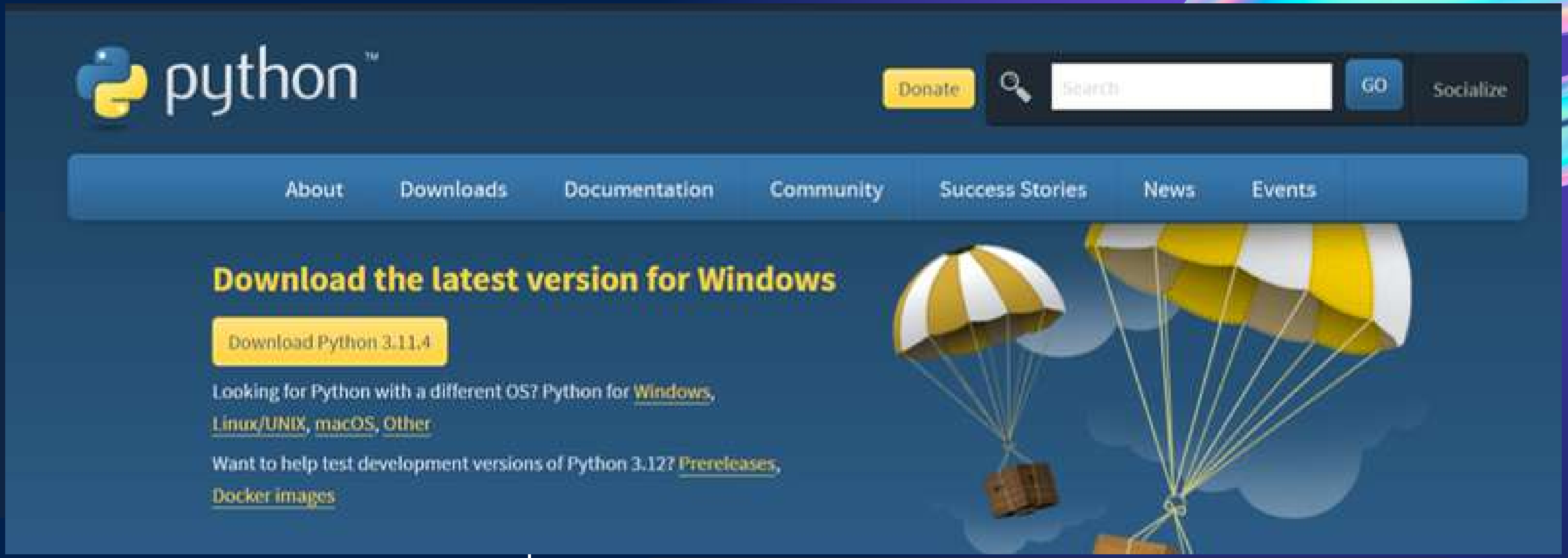
OpenCV
(Open Source Computer Vision Library)

- is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.

https://opencv.org/get-started/

Face detection

Q1 Install Python



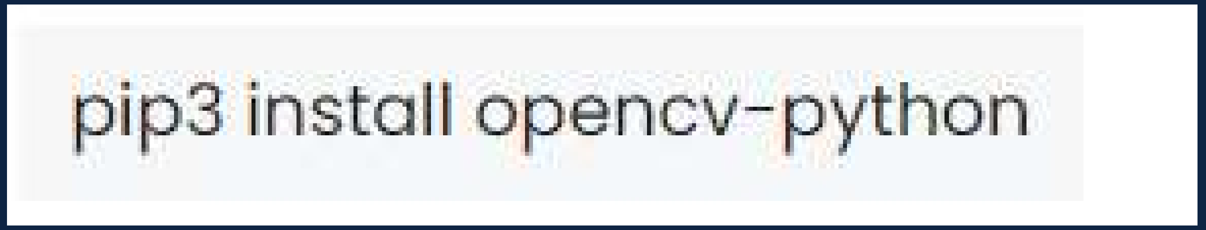
Download the latest version for Windows

Looking for Python with a different OS? Python for Windows, Linux/UNIX, macOS, Other

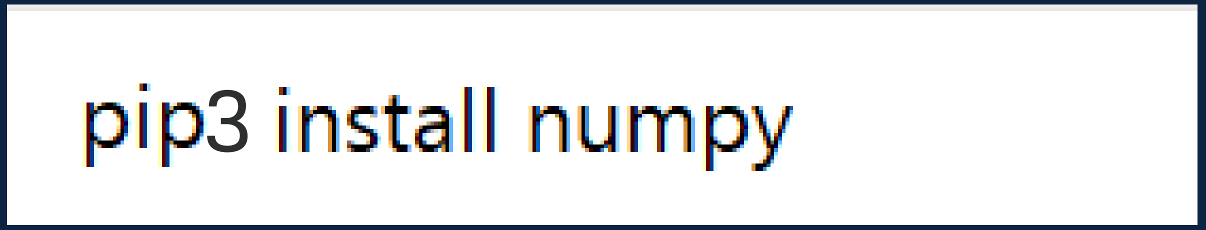
Want to help test development versions of Python 3.12? Prereleases, Docker images

open your command prompt

Q2



```
pip3 install opencv-python
```



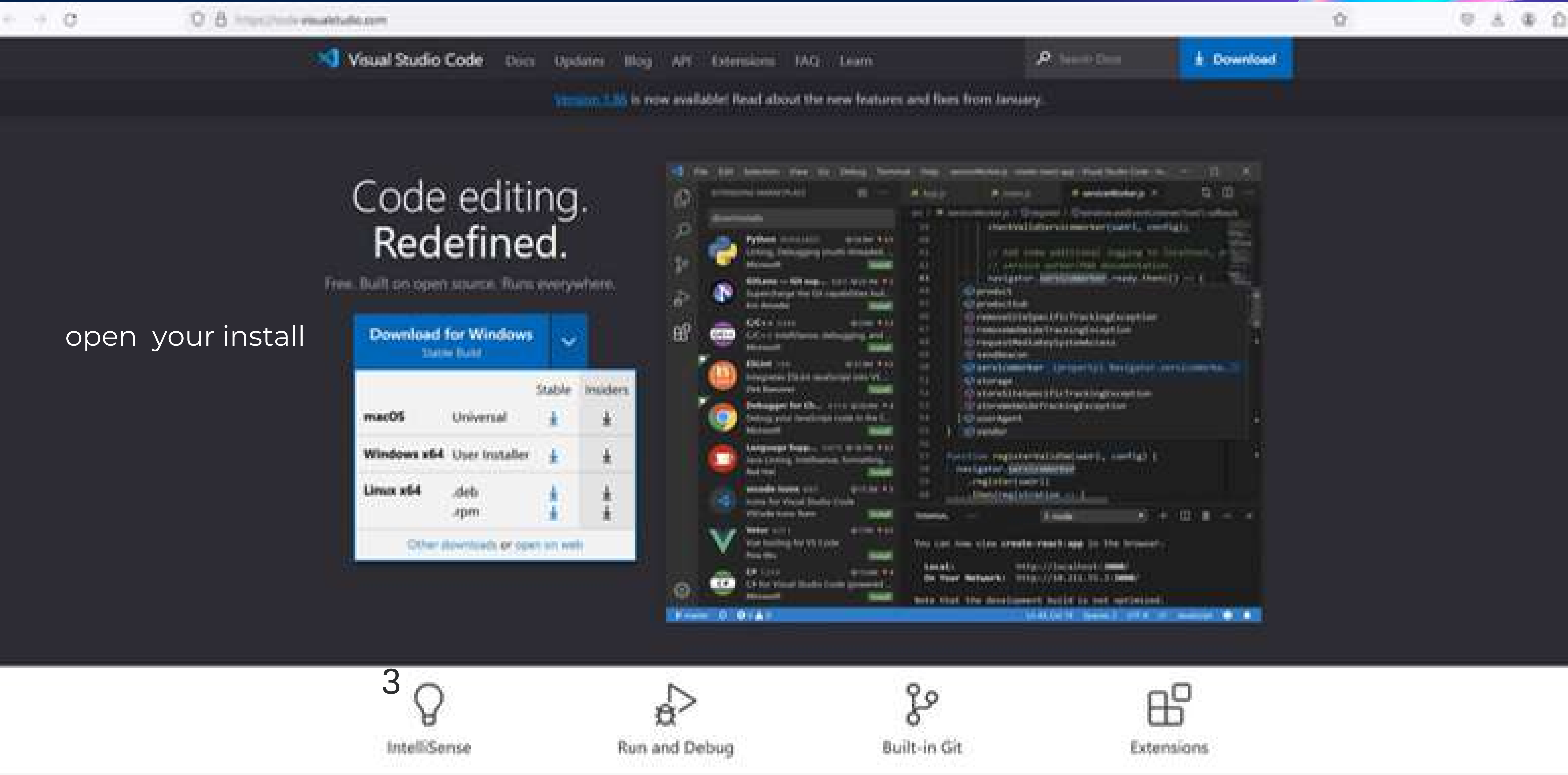
```
pip3 install numpy
```

We' ll use Visual Studio Code

- Creat new file your project (.py file)

Install Vscode

open your install



Version 1.86 is now available! Read about the new features and fixes from January.

Code editing.
Redefined.

Free. Built on open source. Runs everywhere.

		Stable	Insiders
macOS	Universal	↓	↓
Windows x64	User Installer	↓	↓
Linux x64	.deb .rpm	↓ ↓	↓ ↓

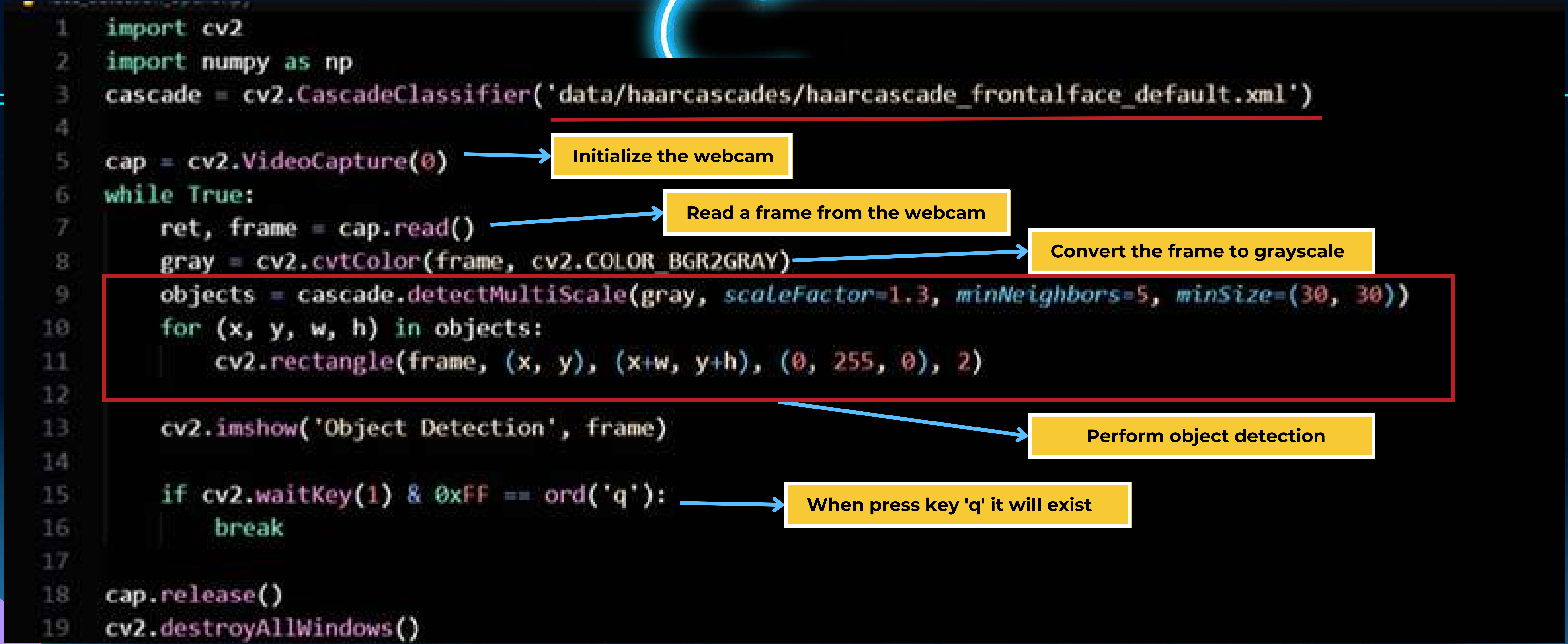
Other downloads or open on web

3

Q3 | Coding

Model (face , eye , etc.)

https://github.com/opencv/opencv/tree/master/data



```python
import cv2
import numpy as np
cascade = cv2.CascadeClassifier('data/haarcascades/haarcascade_frontalface_default.xml')

cap = cv2.VideoCapture(0)
while True:
    ret, frame = cap.read()
    gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
    objects = cascade.detectMultiScale(gray, scaleFactor=1.3, minNeighbors=5, minSize=(30, 30))
    for (x, y, w, h) in objects:
        cv2.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)

    cv2.imshow('Object Detection', frame)

    if cv2.waitKey(1) & 0xFF == ord('q'):
        break

cap.release()
cv2.destroyAllWindows()
```

Initialize the webcam

Read a frame from the webcam

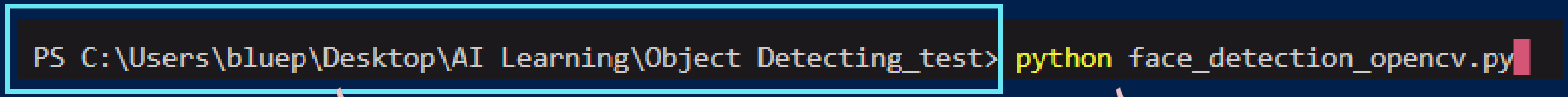
Convert the frame to grayscale

Perform object detection

When press key 'q' it will exist

Try on your self

to run program



```
PS C:\Users\bluep\Desktop\AI Learning\Object Detecting_test> python face_detection_opencv.py
```

directory path file already in

python filename.py

อย่าลืม cd ตำแหน่งไฟล์ให้ถูกต้อง

can try on others object example detection on this link : **https://shorturl.at/ejszI**

DO YOU WANT CONTINUE

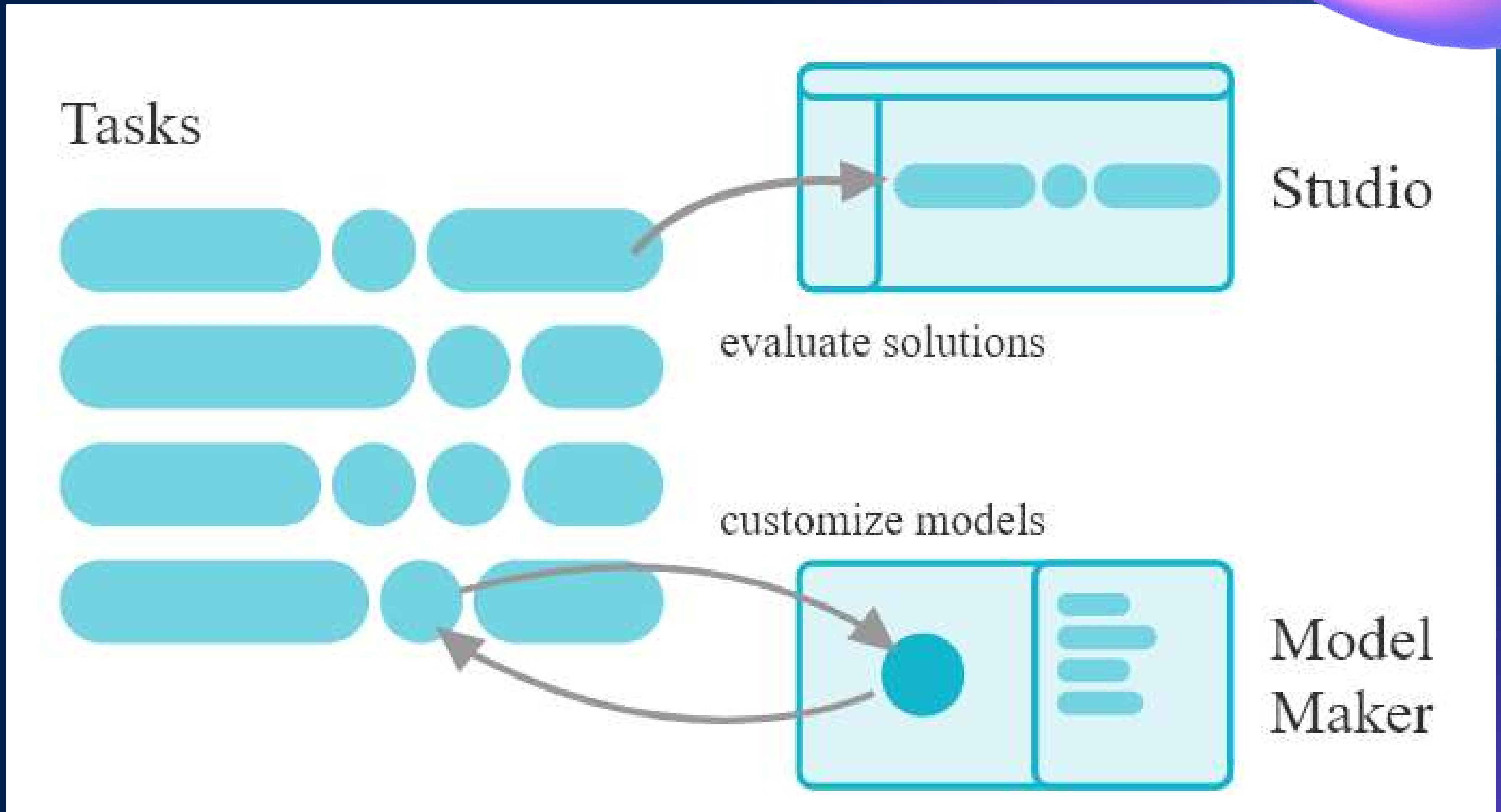
DETECTION ANALYZE TYPE >/?<

NEXT PAGE >>

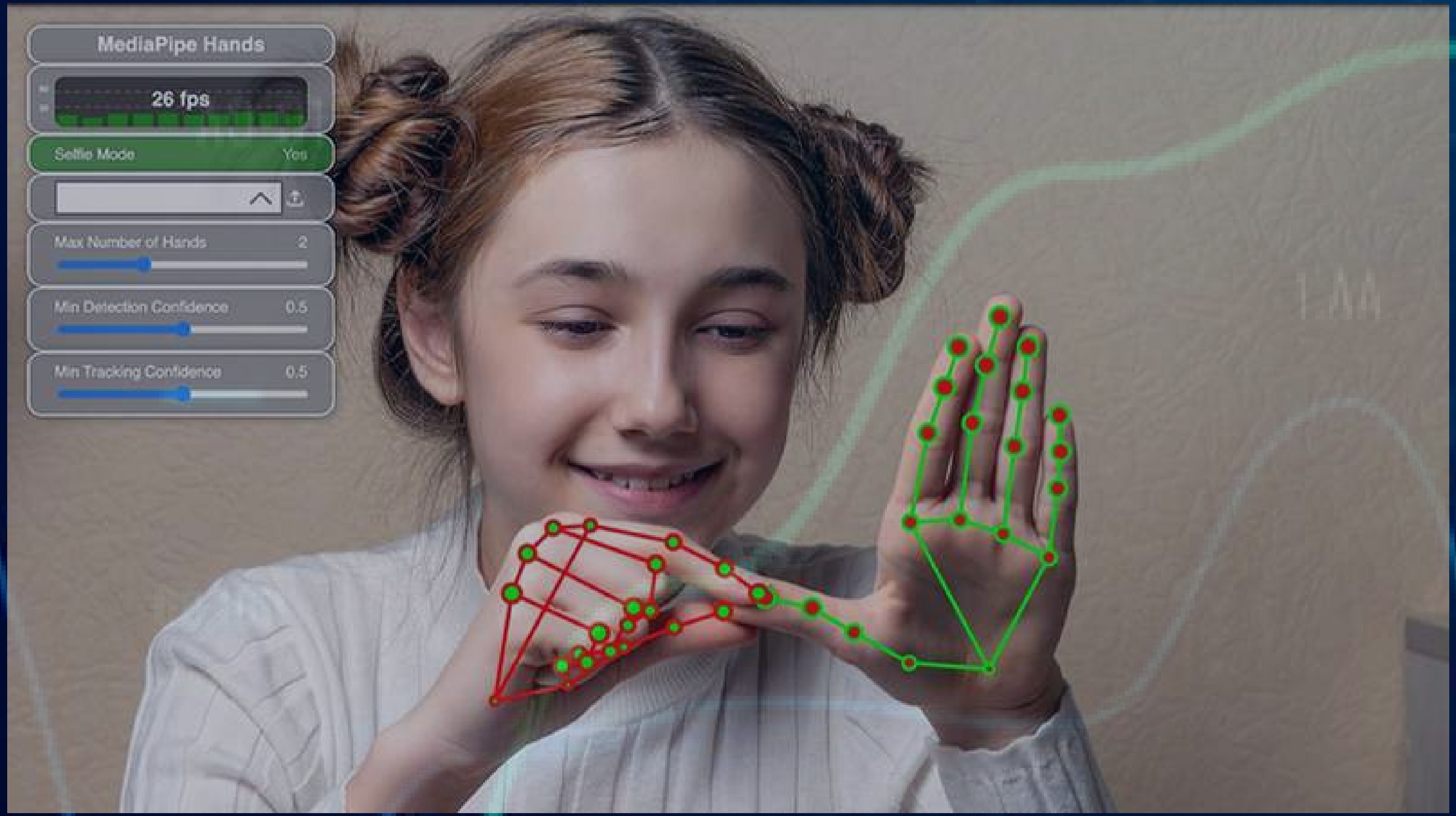
Mediapipe is?

- MediaPipe Solutions provides a suite of libraries and tools for you to quickly apply artificial intelligence (AI) and machine learning (ML) techniques in your applications.

- You can plug these solutions into your applications immediately, customize them to your needs, and use them across multiple development platforms. MediaPipe Solutions is part of the MediaPipe open source project, so you can further customize the solutions code to meet your application needs.



MediaPipe Hands



MediaPipe Hands

26 fps

Selfie Mode Yes

Max Number of Hands 2

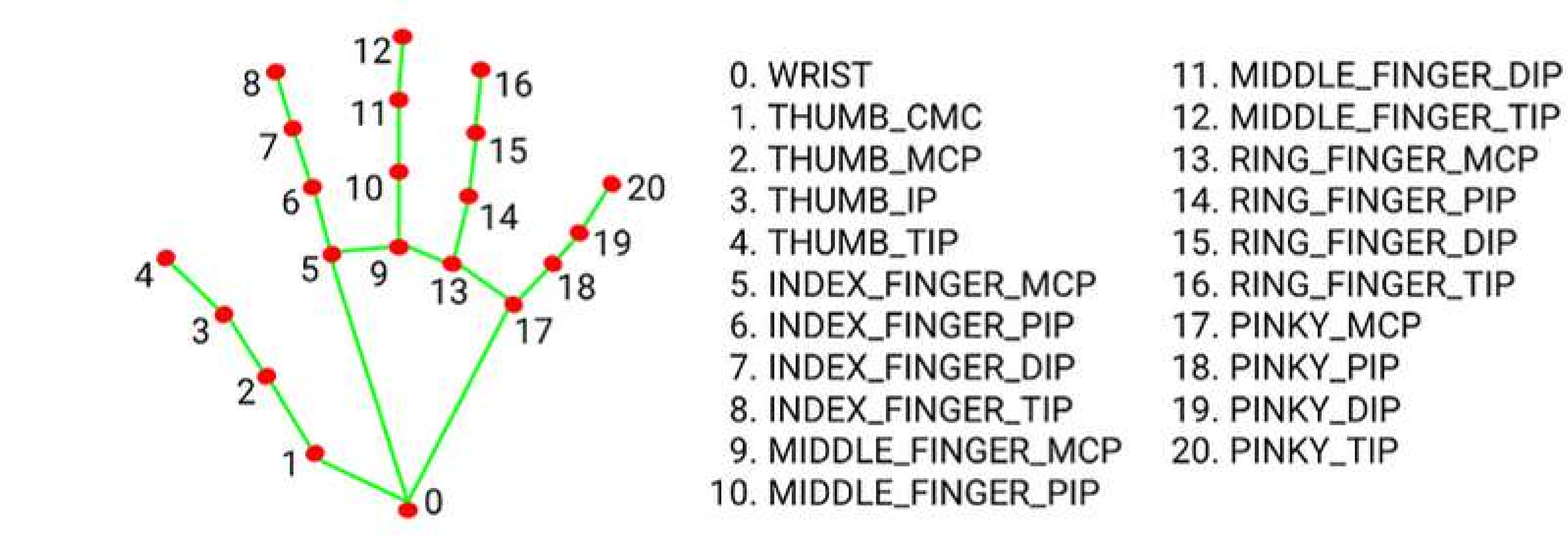
Min Detection Confidence 0.5

Min Tracking Confidence 0.5

Today we will learn to use MediaPipe, which is a Machine Learning Solutions or a ready-made program from Google that can be used to do Hand Tracking accurately. And as fast as real-time tracking.

Because MediaPipe has a number of solutions available, ranging from gesture detection to facial recognition, today we're going to use MediaPipe Hands that detect hands.

21 point of finger Landmarks



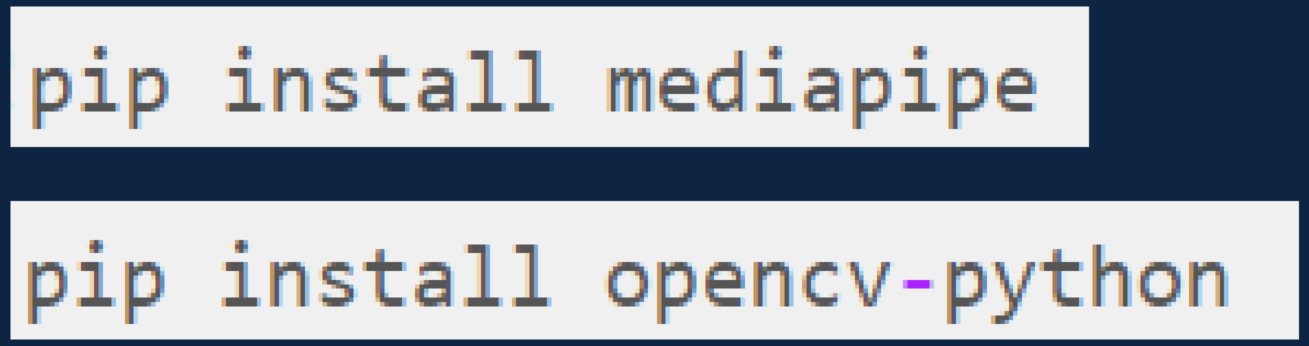
0. WRIST
1. THUMB_CMC
2. THUMB_MCP
3. THUMB_IP
4. THUMB_TIP
5. INDEX_FINGER_MCP
6. INDEX_FINGER_PIP
7. INDEX_FINGER_DIP
8. INDEX_FINGER_TIP
9. MIDDLE_FINGER_MCP
10. MIDDLE_FINGER_PIP
11. MIDDLE_FINGER_DIP
12. MIDDLE_FINGER_TIP
13. RING_FINGER_MCP
14. RING_FINGER_PIP
15. RING_FINGER_DIP
16. RING_FINGER_TIP
17. PINKY_MCP
18. PINKY_PIP
19. PINKY_DIP
20. PINKY_TIP

Hand Tracking starts by sensing the palm with the " Palm Detection Model " and then identifies 21 key hand locations.

Hand Tracking

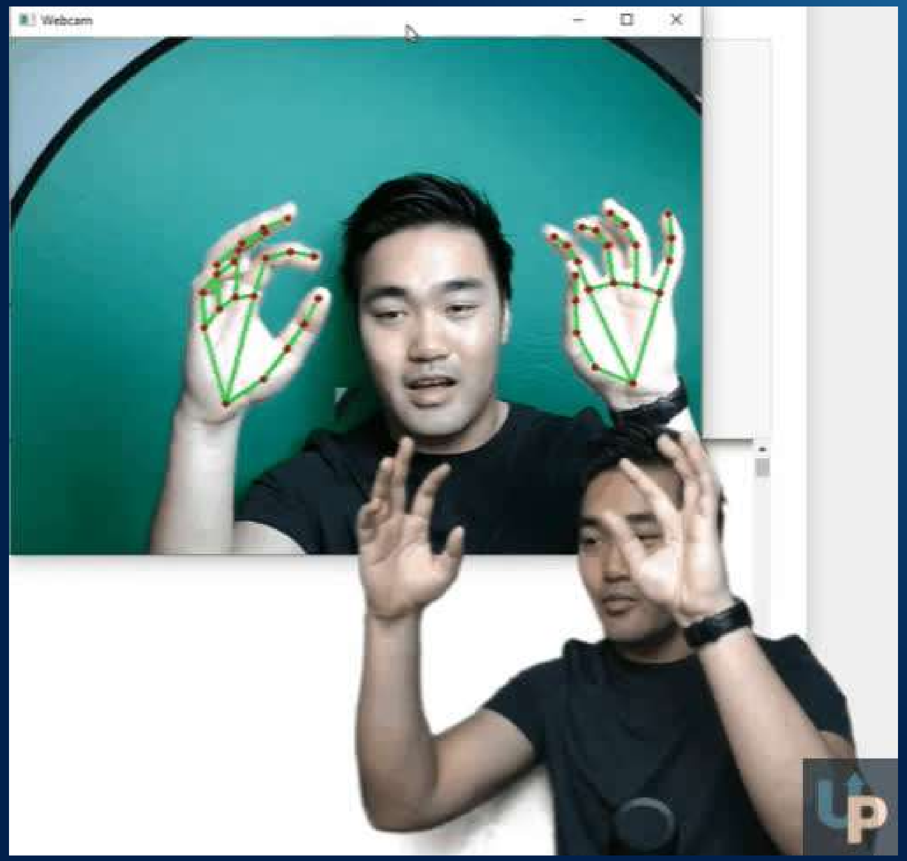
open your command prompt

Q1



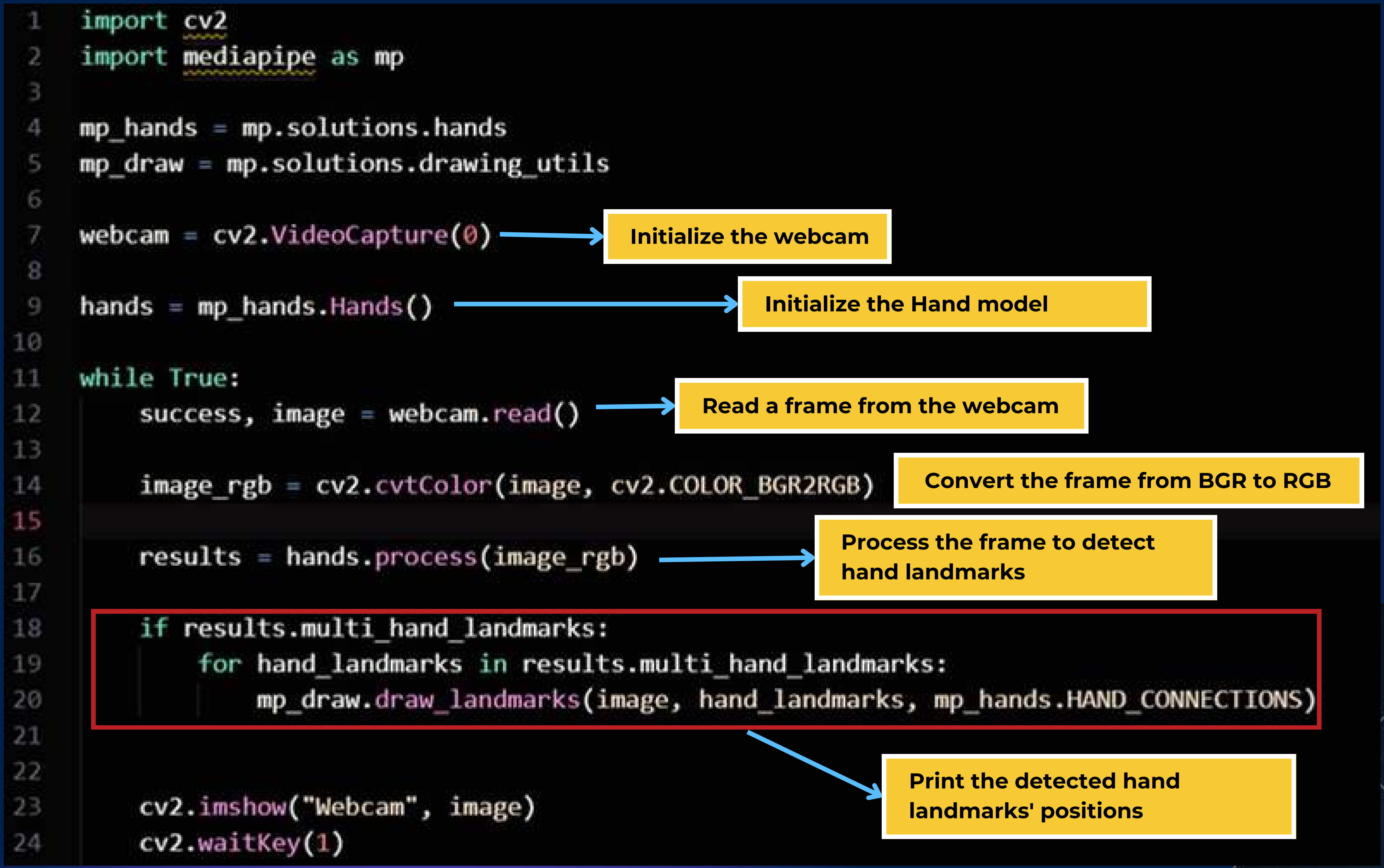
```
pip install mediapipe
```

```
pip install opencv-python
```



Q3 Hand Track Coding

Our Vision



```python
import cv2
import mediapipe as mp

mp_hands = mp.solutions.hands
mp_draw = mp.solutions.drawing_utils

webcam = cv2.VideoCapture(0)

hands = mp_hands.Hands()

while True:
    success, image = webcam.read()

    image_rgb = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

    results = hands.process(image_rgb)

    if results.multi_hand_landmarks:
        for hand_landmarks in results.multi_hand_landmarks:
            mp_draw.draw_landmarks(image, hand_landmarks, mp_hands.HAND_CONNECTIONS)


    cv2.imshow("Webcam", image)
    cv2.waitKey(1)
```

Initialize the webcam

Initialize the Hand model

Read a frame from the webcam

Convert the frame from BGR to RGB

Process the frame to detect hand landmarks

Print the detected hand landmarks' positions

Try on your self

Hand Count Finger Send To NodeRed

open your command prompt

Q1

```
pip3 install mediapipe
```

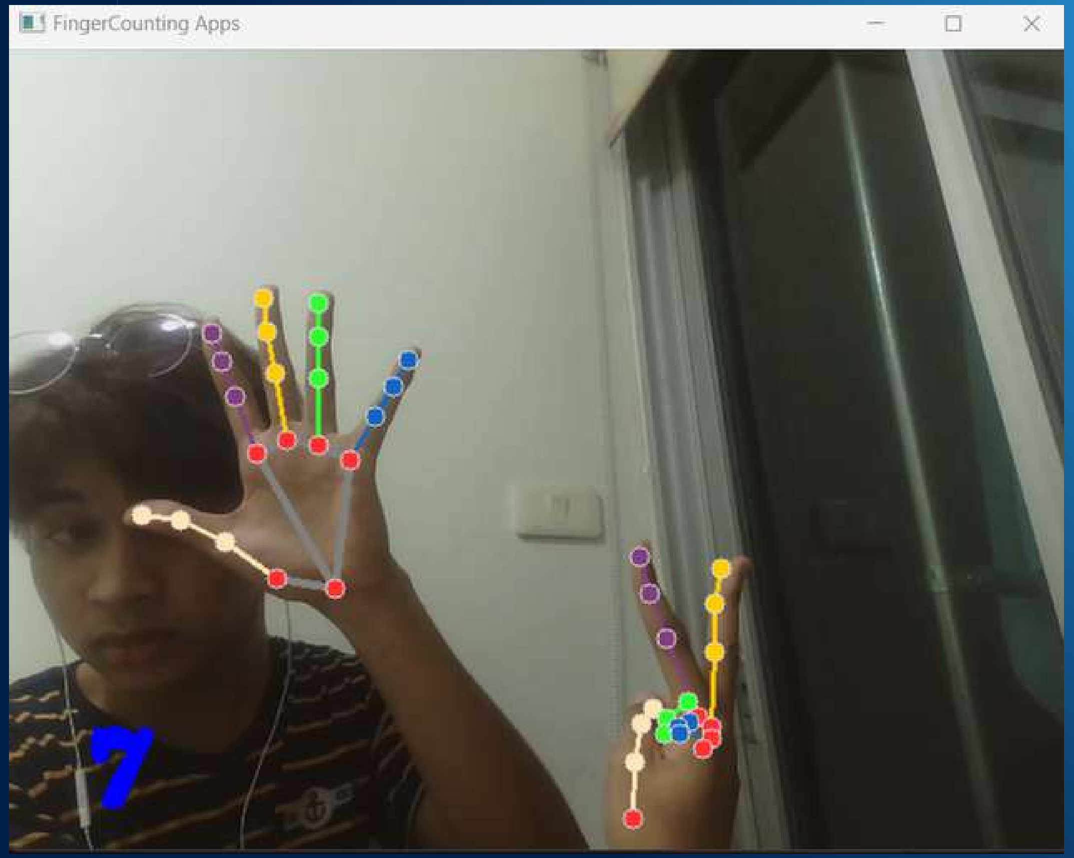
```
pip3 install opencv-python
```

Q2

install NodeRed

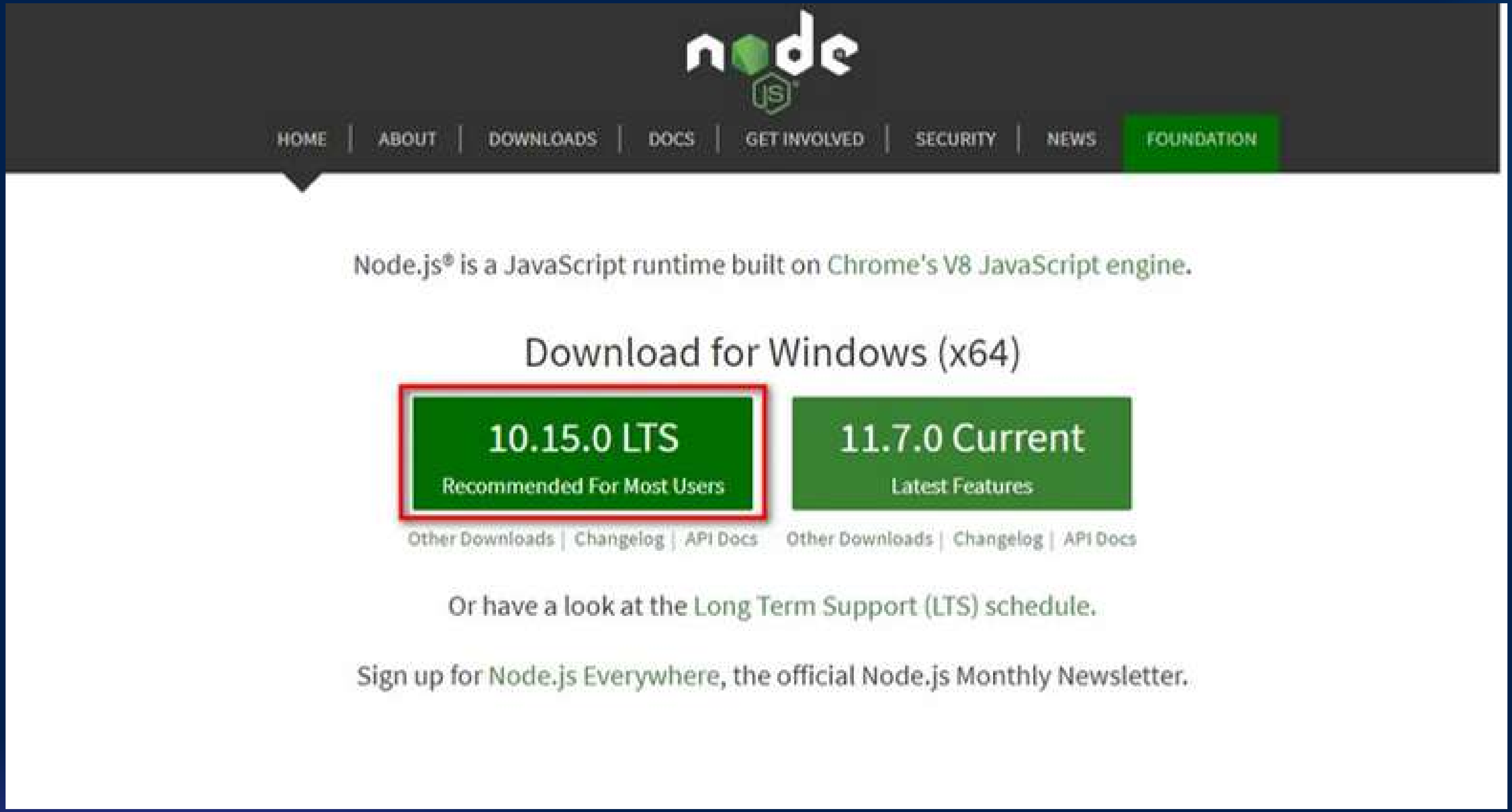
```
pip3 install requests
```

Node-RED



Hand Count Finger Send To NodeRed

Q2 install NodeRed



node JS
HOME | ABOUT | DOWNLOADS | DOCS | GET INVOLVED | SECURITY | NEWS | FOUNDATION

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

Download for Windows (x64)

10.15.0 LTS
Recommended For Most Users
11.7.0 Current
Latest Features
Other Downloads | Changelog | API Docs
Other Downloads | Changelog | API Docs

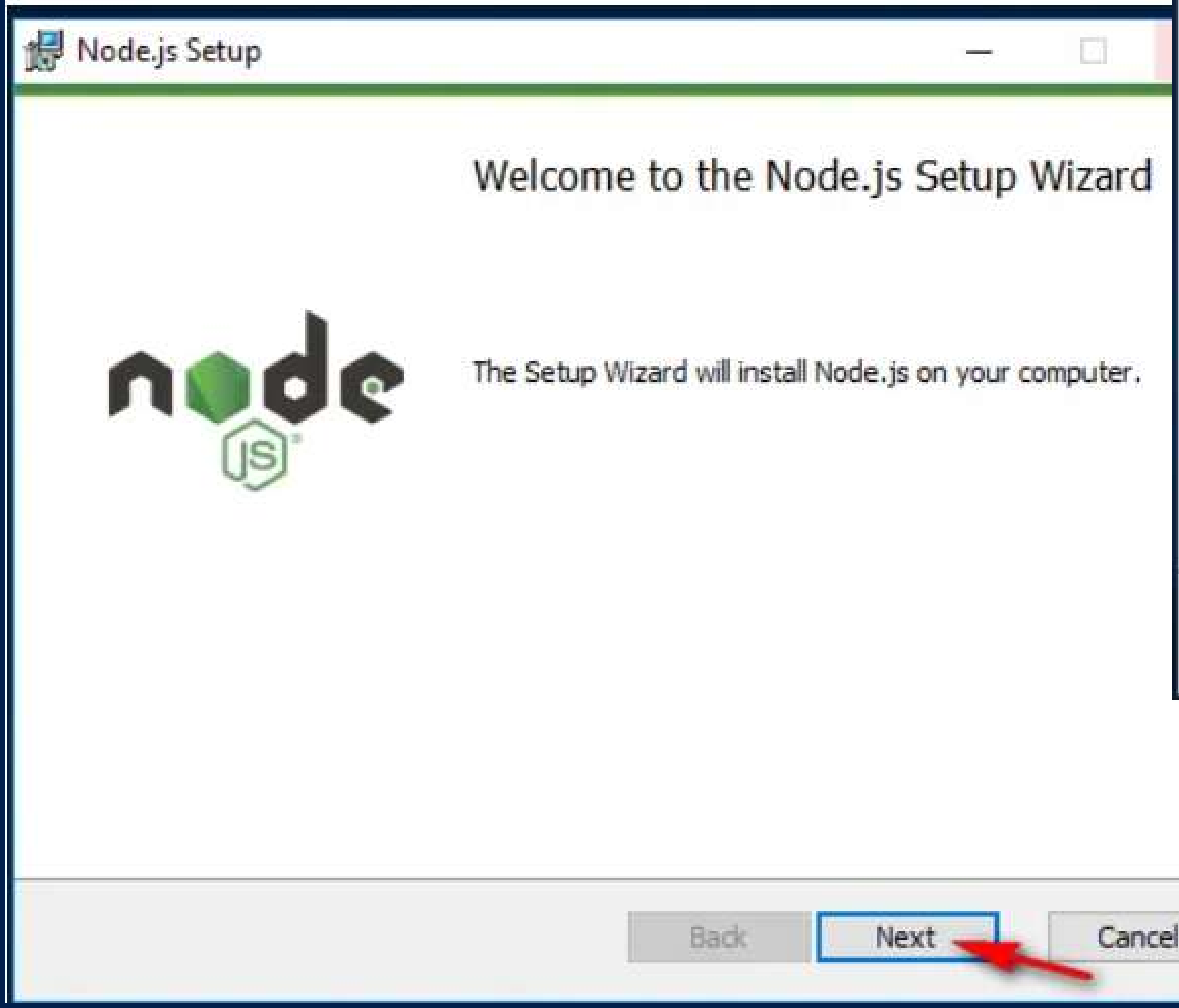
Or have a look at the Long Term Support (LTS) schedule.

Sign up for Node.js Everywhere, the official Node.js Monthly Newsletter.

1. Install Node.JS (https://nodejs.org/en/)
Go to the nodejs.org website and choose to download the LTS version.

Hand Count Finger Send To NodeRed

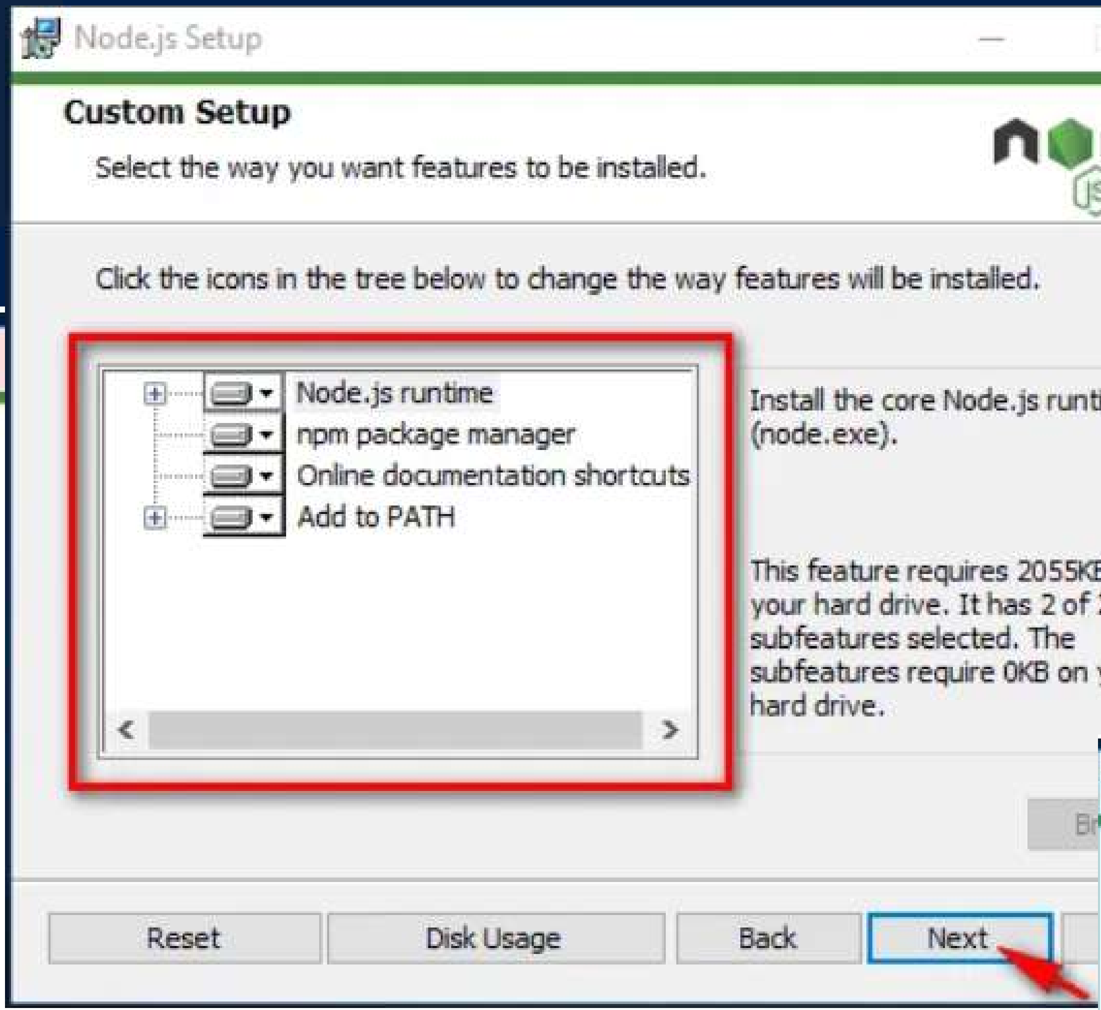
Q2 | **install NodeRed**



Node.js Setup

Welcome to the Node.js Setup Wizard

The Setup Wizard will install Node.js on your computer.



Node.js Setup

Custom Setup

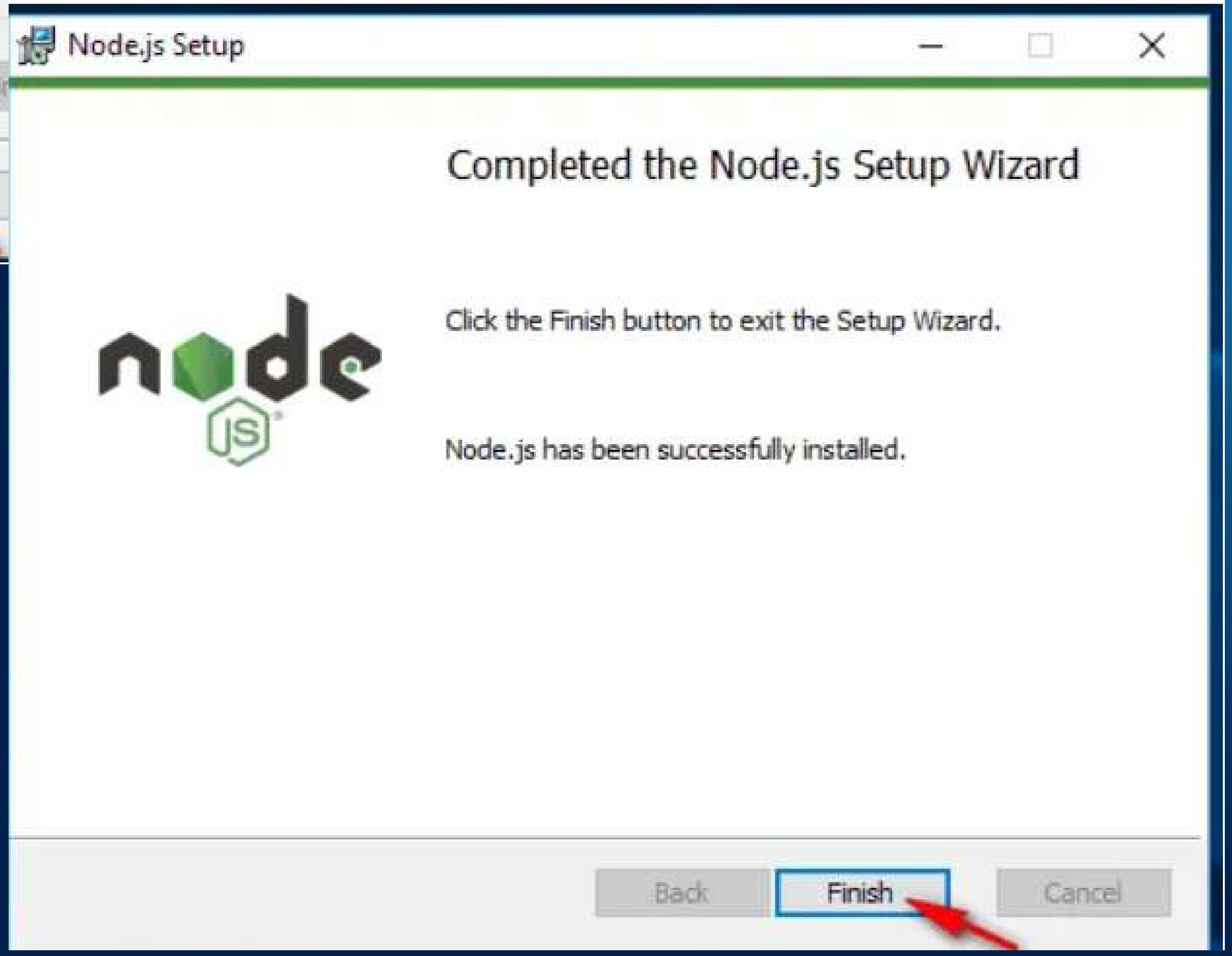
Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

- Node.js runtime
- npm package manager
- Online documentation shortcuts
- Add to PATH

Install the core Node.js runtime (node.exe).

This feature requires 2055KB on your hard drive. It has 2 of 2 subfeatures selected. The subfeatures require 0KB on your hard drive.



Node.js Setup

Completed the Node.js Setup Wizard

Click the Finish button to exit the Setup Wizard.

Node.js has been successfully installed.

Node-RED

Hand Count Finger Send To NodeRed

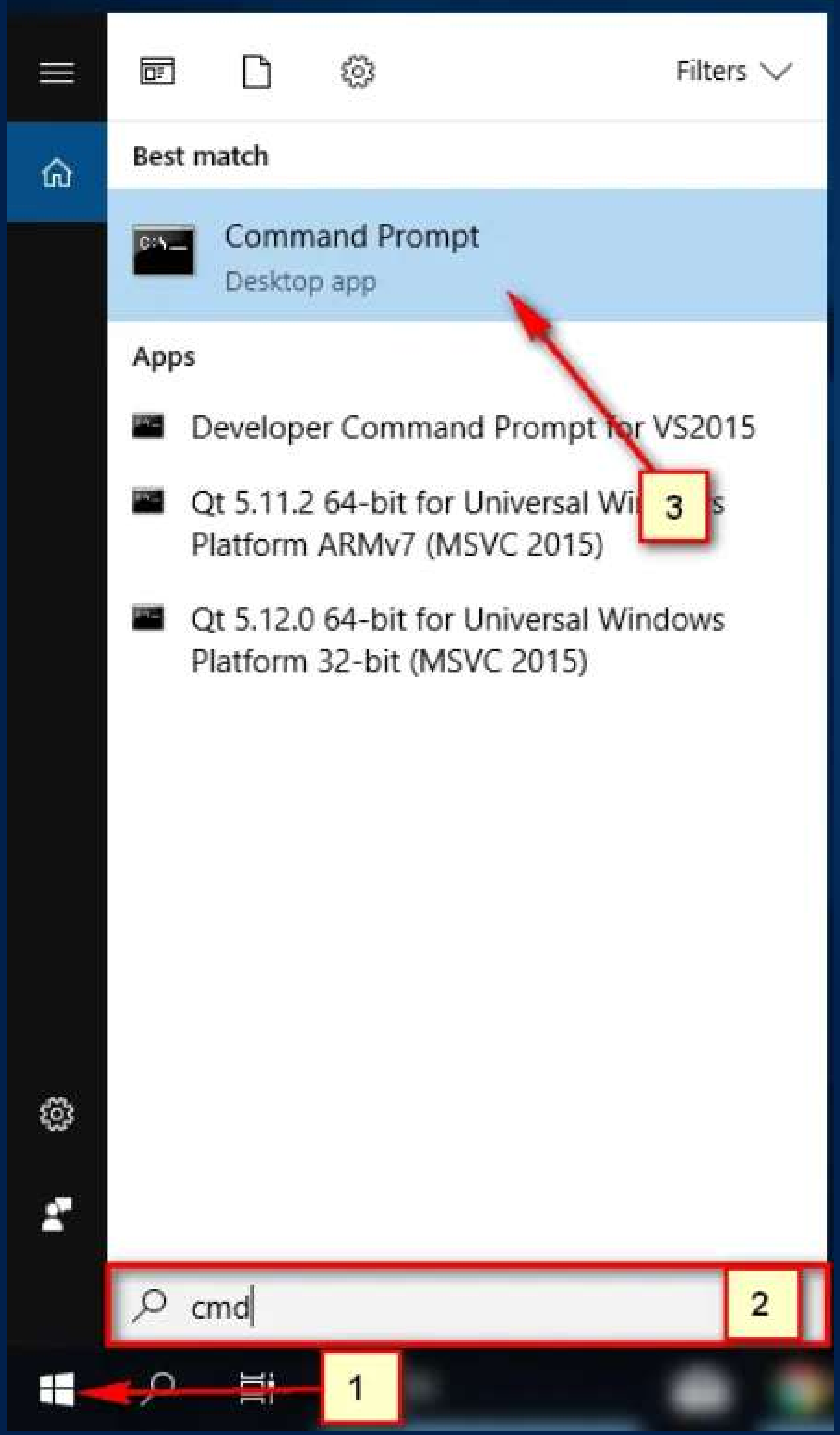
Q2 install NodeRed

2. Check Version Node.JS with CMD

3

#1. Press the start menu button
#2.Type cmd to search
#3.Select Command Prompt

3



Filters

Best match

Command Prompt
Desktop app

Apps

Developer Command Prompt for VS2015

Qt 5.11.2 64-bit for Universal Windows Platform ARMv7 (MSVC 2015)

Qt 5.12.0 64-bit for Universal Windows Platform 32-bit (MSVC 2015)

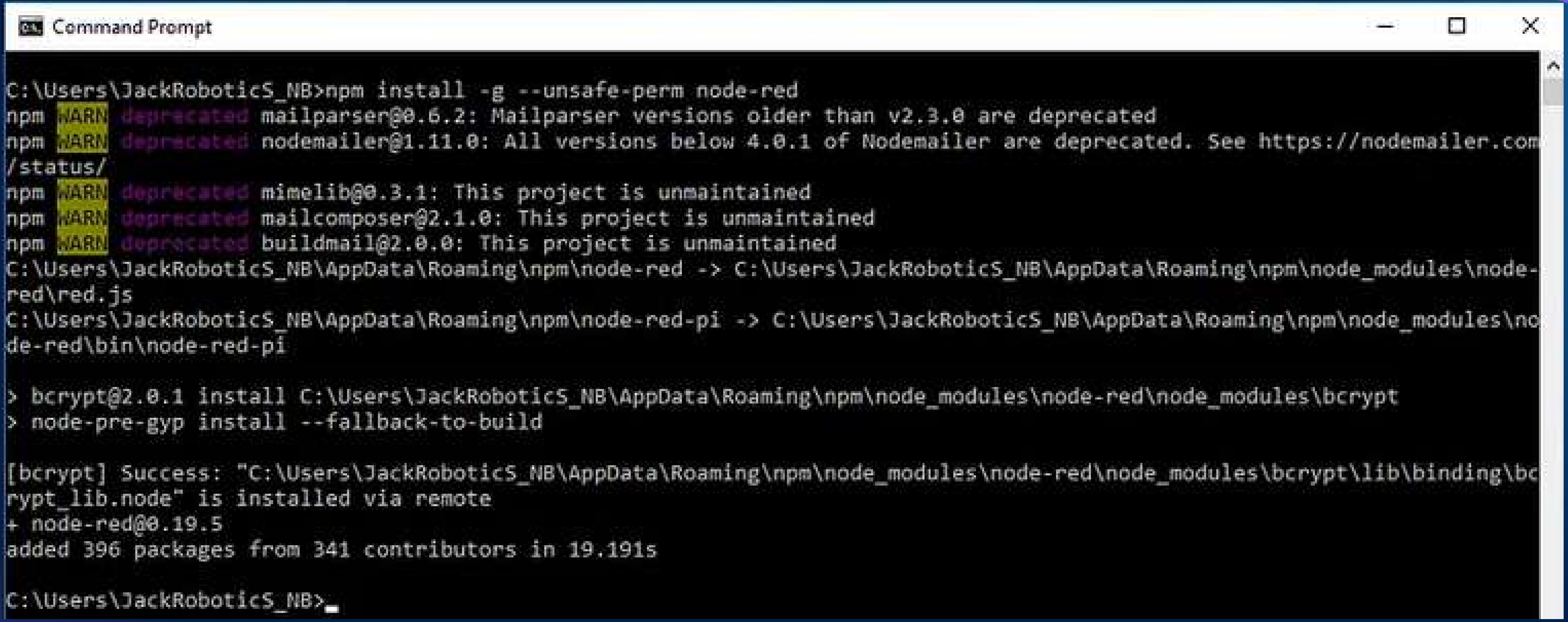
cmd

Hand Count Finger Send To NodeRed

Q2

```
npm install -g --unsafe-perm node-red
```

3. Install Node-Red with npm



```
C:\Users\JackRoboticS_NB>npm install -g --unsafe-perm node-red
npm WARN deprecated mailparser@0.6.2: Mailparser versions older than v2.3.0 are deprecated
npm WARN deprecated nodemailer@1.11.0: All versions below 4.0.1 of Nodemailer are deprecated. See https://nodemailer.com
/status/
npm WARN deprecated mimelib@0.3.1: This project is unmaintained
npm WARN deprecated mailcomposer@2.1.0: This project is unmaintained
npm WARN deprecated buildmail@2.0.0: This project is unmaintained
C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node-red -> C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node_modules\node-
red\red.js
C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node-red-pi -> C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node_modules\no
de-red\bin\node-red-pi

> bcrypt@2.0.1 install C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node_modules\node-red\node_modules\bcrypt
> node-pre-gyp install --fallback-to-build

[bcrypt] Success: "C:\Users\JackRoboticS_NB\AppData\Roaming\npm\node_modules\node-red\node_modules\bcrypt\lib\binding\bc
rypt_lib.node" is installed via remote
+ node-red@0.19.5
added 396 packages from 341 contributors in 19.191s

C:\Users\JackRoboticS_NB>_
```

When Node-Red is finished installing, it will show the screen as shown below. indicates that the installation is complete

Hand Count Finger Send To NodeRed

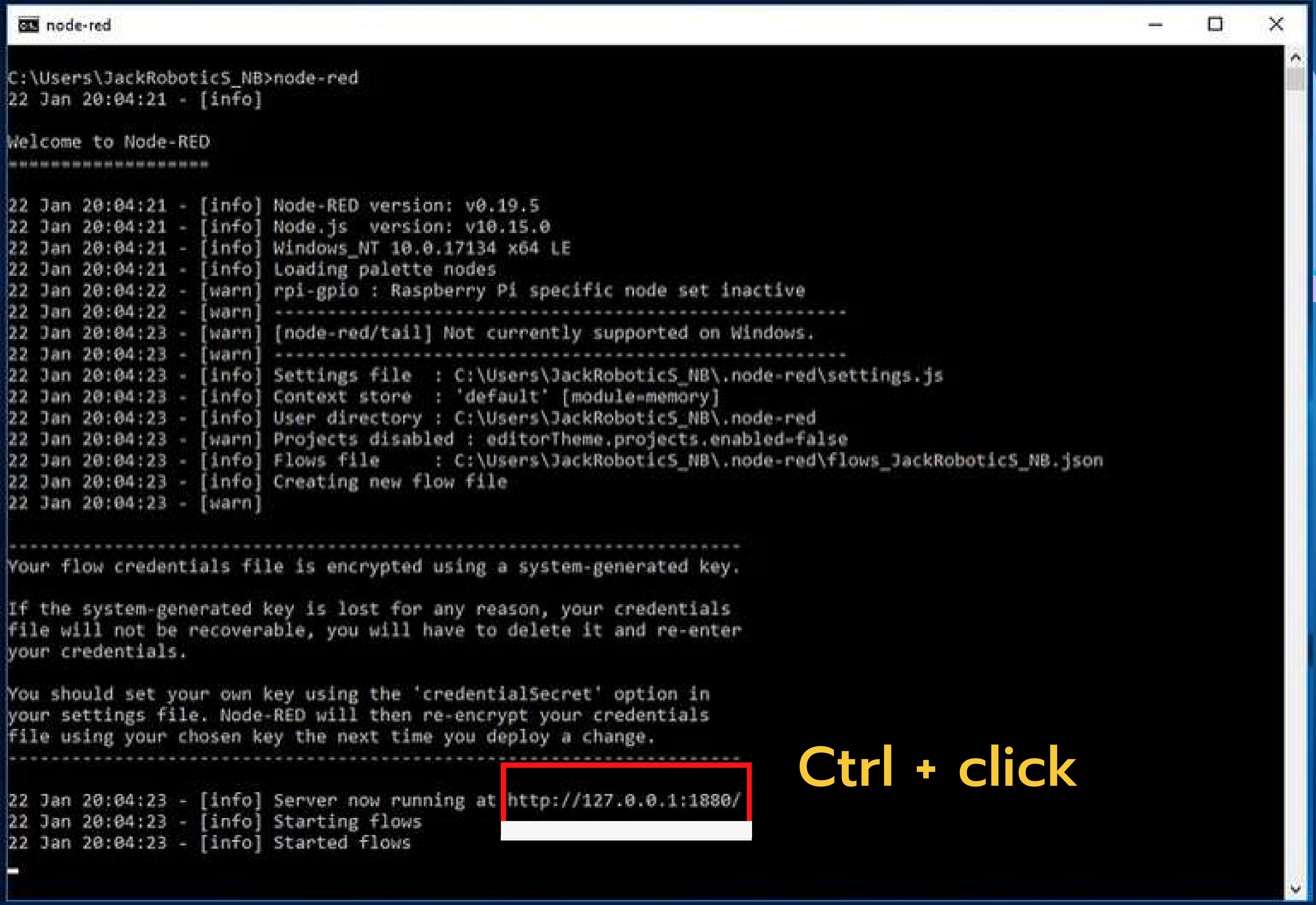
Q2 | install NodeRed

4. Run Node-Red

```
node-red
```

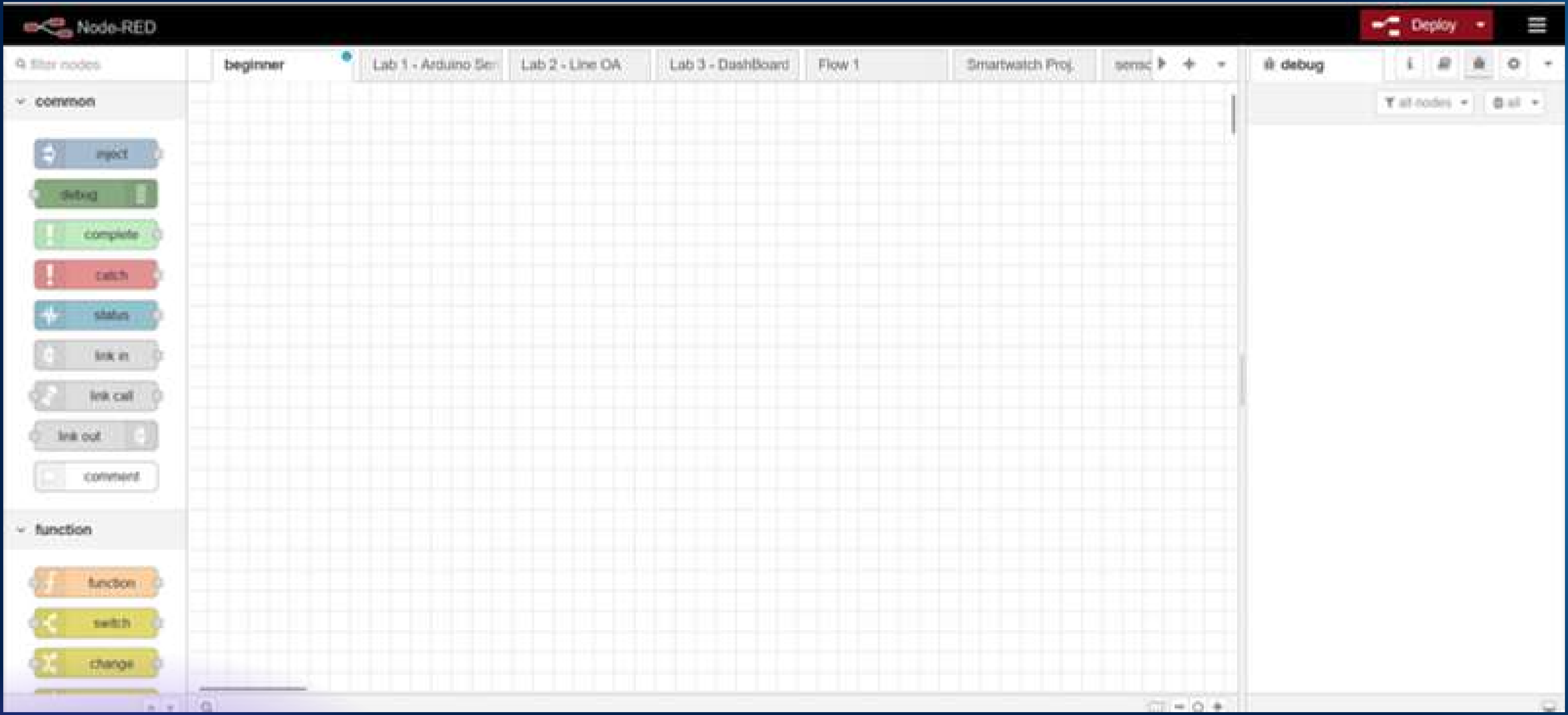
Type the command node-red

into cmd, it will look like the picture.



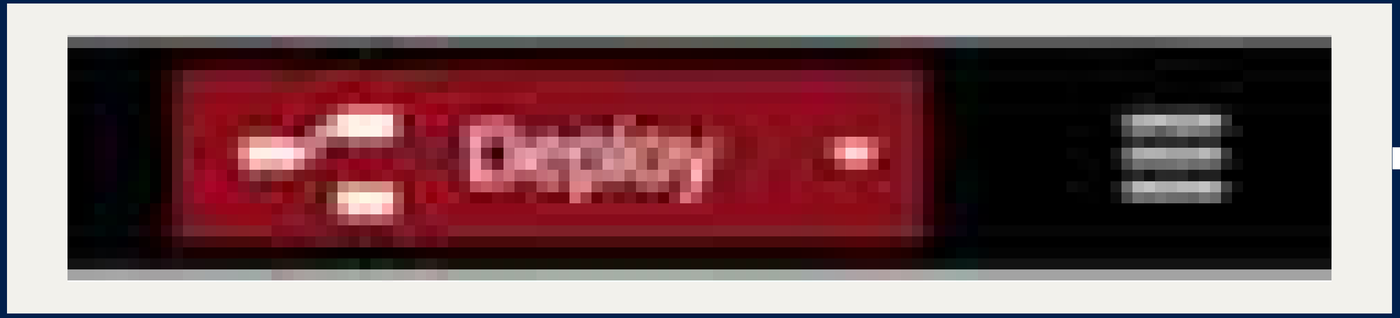
```
C:\Users\JackRoboticS_NB>node-red
22 Jan 20:04:21 - [info]

Welcome to Node-RED
===================

22 Jan 20:04:21 - [info] Node-RED version: v0.19.5
22 Jan 20:04:21 - [info] Node.js  version: v10.15.0
22 Jan 20:04:21 - [info] Windows_NT 10.0.17134 x64 LE
22 Jan 20:04:21 - [info] Loading palette nodes
22 Jan 20:04:22 - [warn] rpi-gpio : Raspberry Pi specific node set inactive
22 Jan 20:04:22 - [warn] ------------------------------------------------------
22 Jan 20:04:23 - [warn] [node-red/tail] Not currently supported on Windows.
22 Jan 20:04:23 - [warn] ------------------------------------------------------
22 Jan 20:04:23 - [info] Settings file  : C:\Users\JackRoboticS_NB\.node-red\settings.js
22 Jan 20:04:23 - [info] Context store  : 'default' [module=memory]
22 Jan 20:04:23 - [info] User directory : C:\Users\JackRoboticS_NB\.node-red
22 Jan 20:04:23 - [warn] Projects disabled : editorTheme.projects.enabled=false
22 Jan 20:04:23 - [info] Flows file     : C:\Users\JackRoboticS_NB\.node-red\flows_JackRoboticS_NB.json
22 Jan 20:04:23 - [info] Creating new flow file
22 Jan 20:04:23 - [warn]

---------------------------------------------------------------------
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file. Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
---------------------------------------------------------------------

22 Jan 20:04:23 - [info] Server now running at http://127.0.0.1:1880/
22 Jan 20:04:23 - [info] Starting flows
22 Jan 20:04:23 - [info] Started flows
```

Ctrl + click

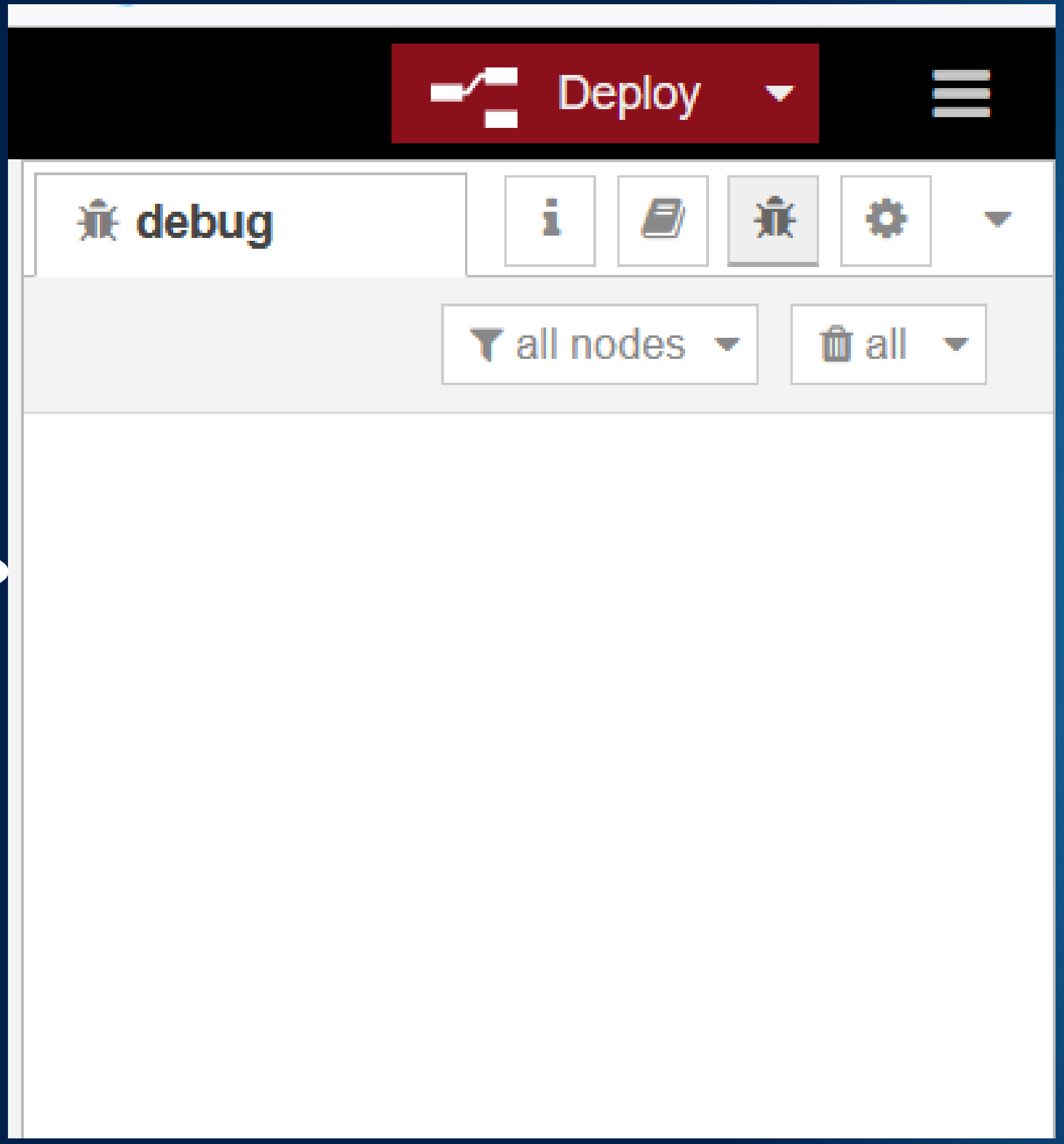


Workspace Node-Red

Deploy Button



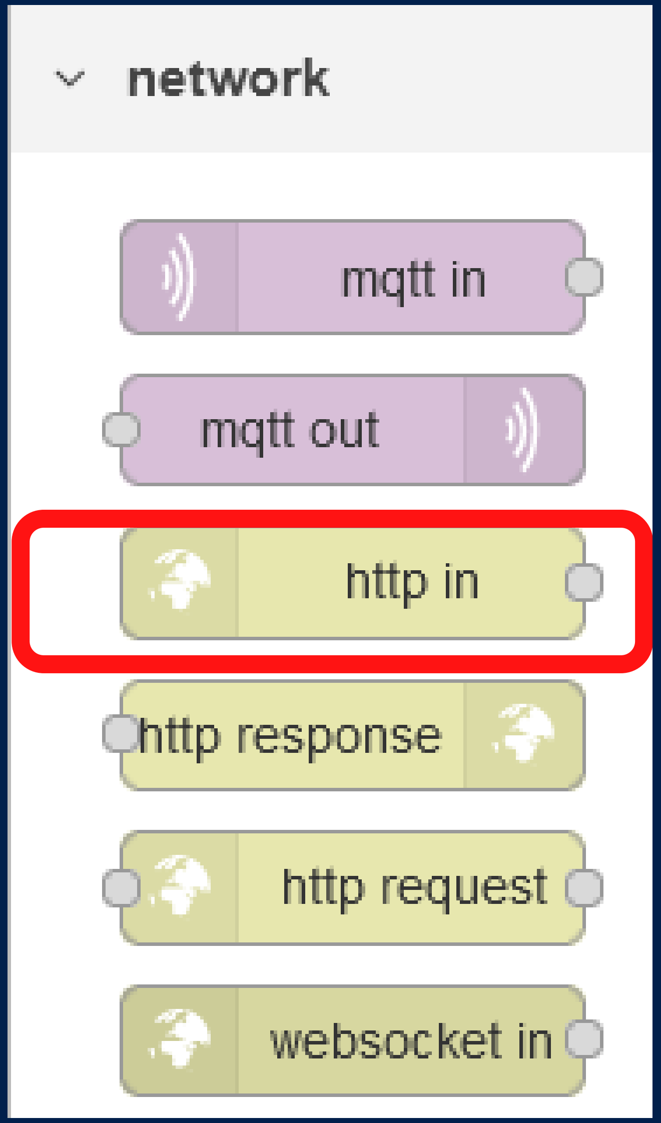
- ปุ่มนี้ไว้กดทุกครั้งเวลา อัพเดท block code หลังแก้ไขเสร็จ

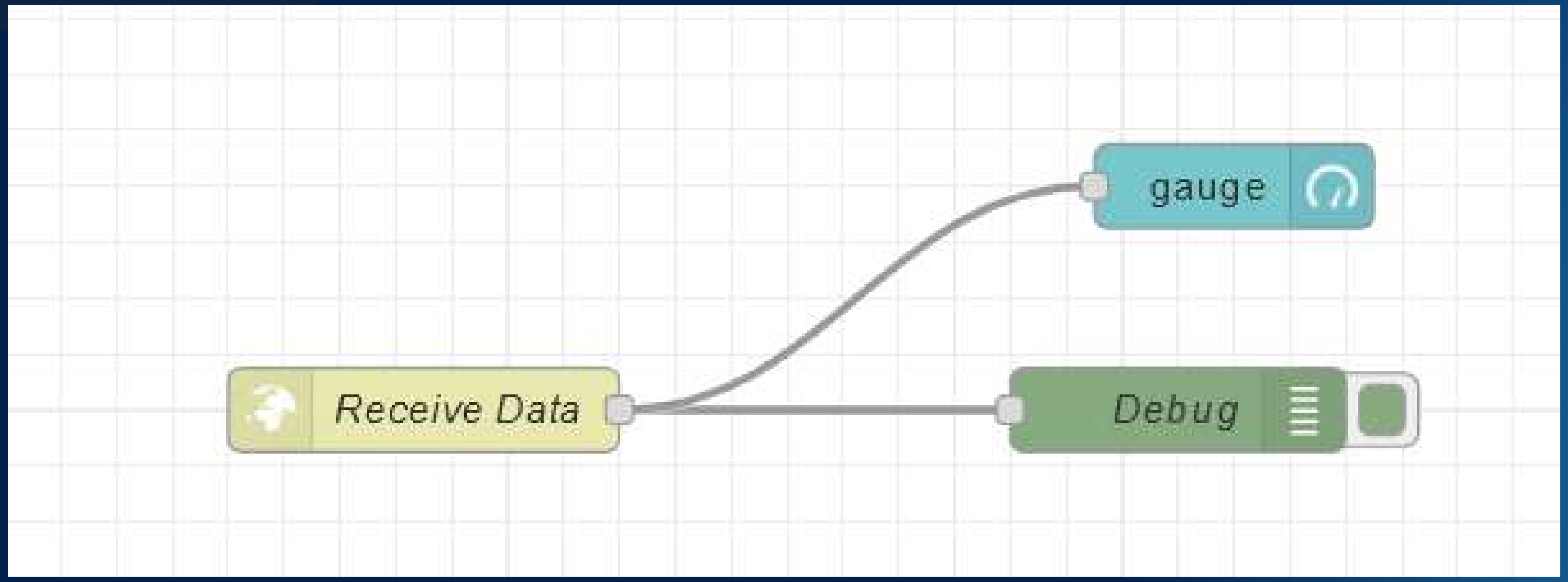


นำไว้ดู Debug เวลามีค่าเข้ามาจาก การส่งข้อมูล

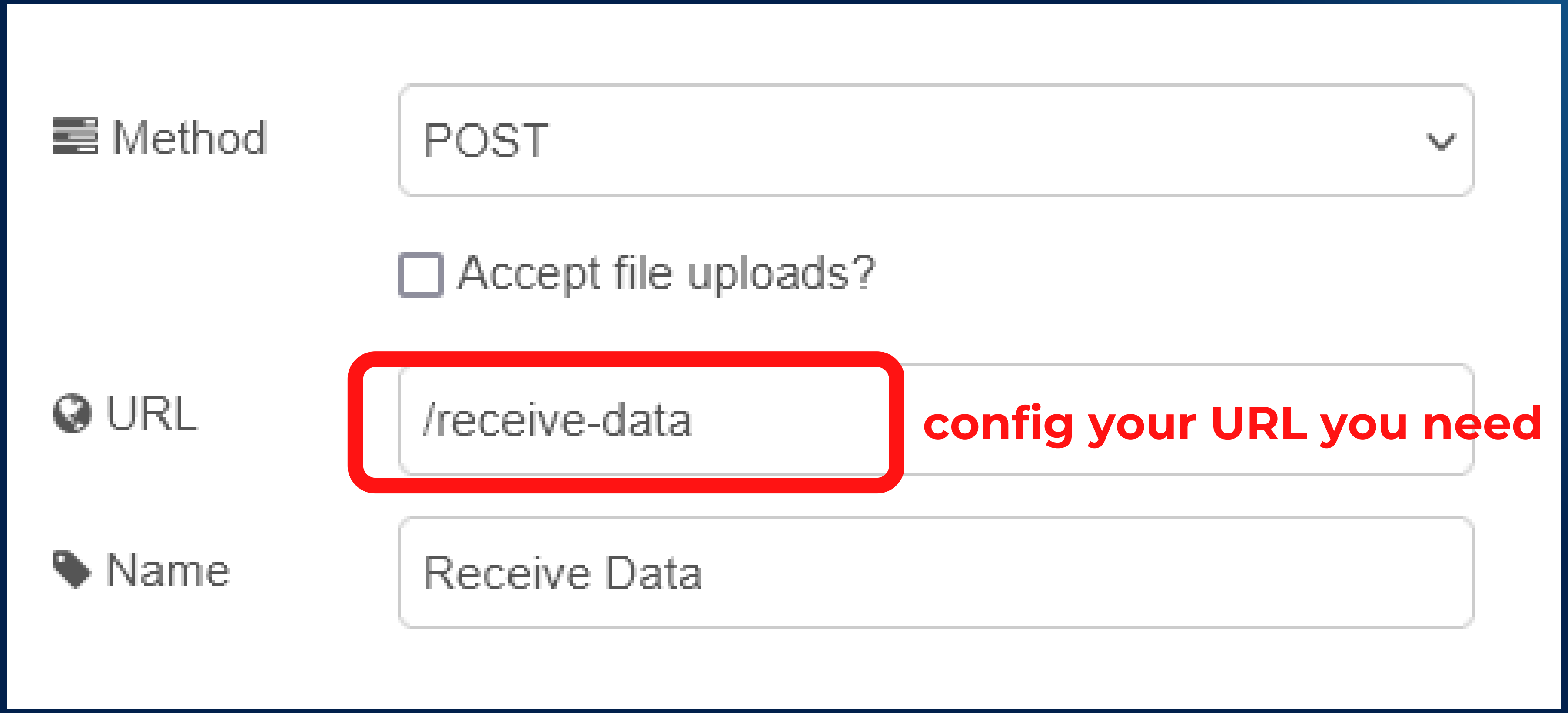
Data Value / Struct after processing

Q3 | Configure padlet in node red





double-click in nodes Receive Data



Method: POST

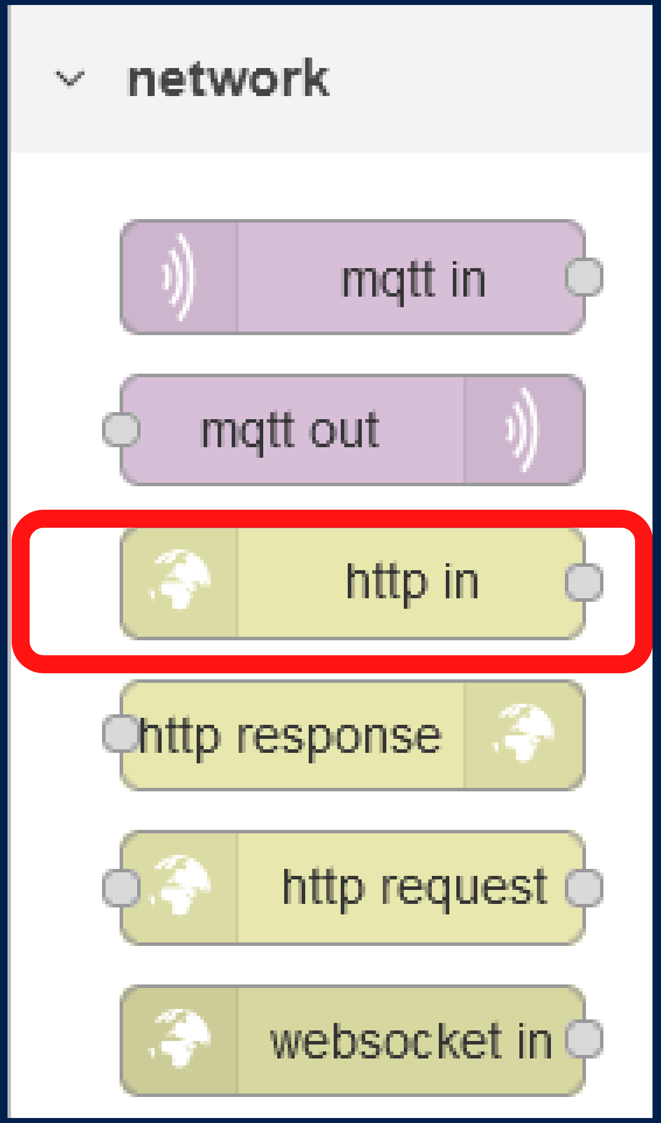
□ Accept file uploads?

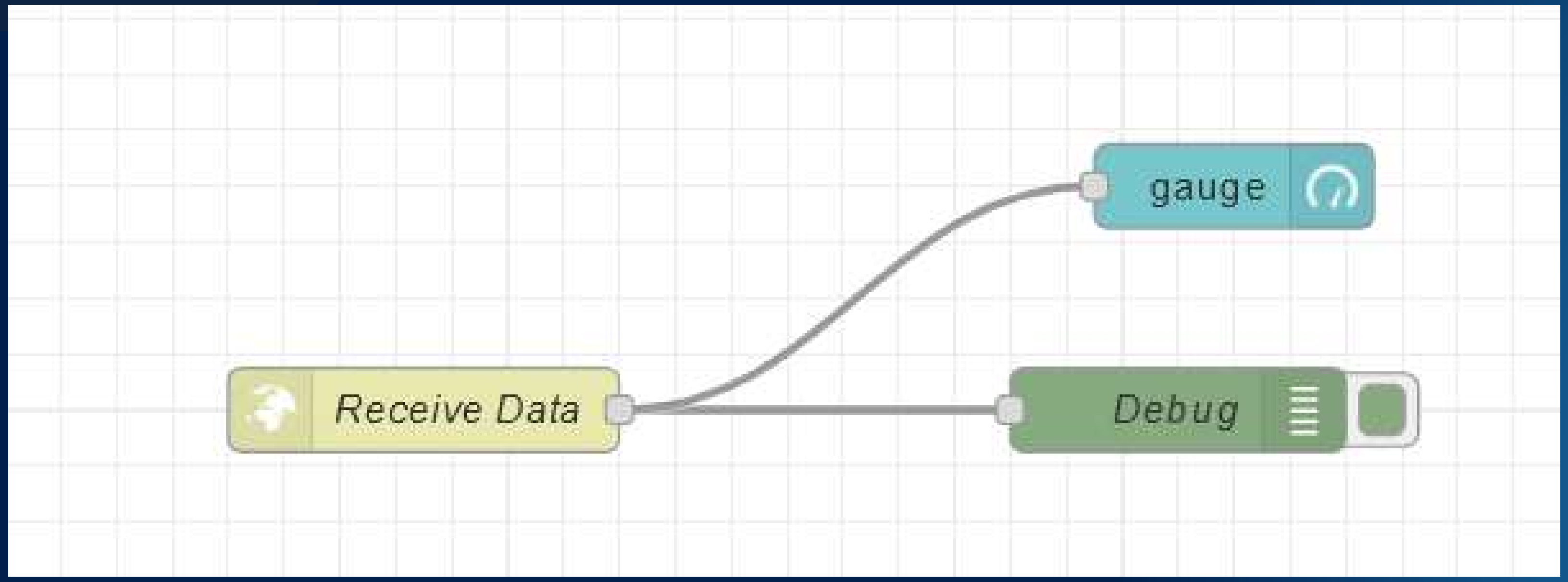
URL: /receive-data

config your URL you need

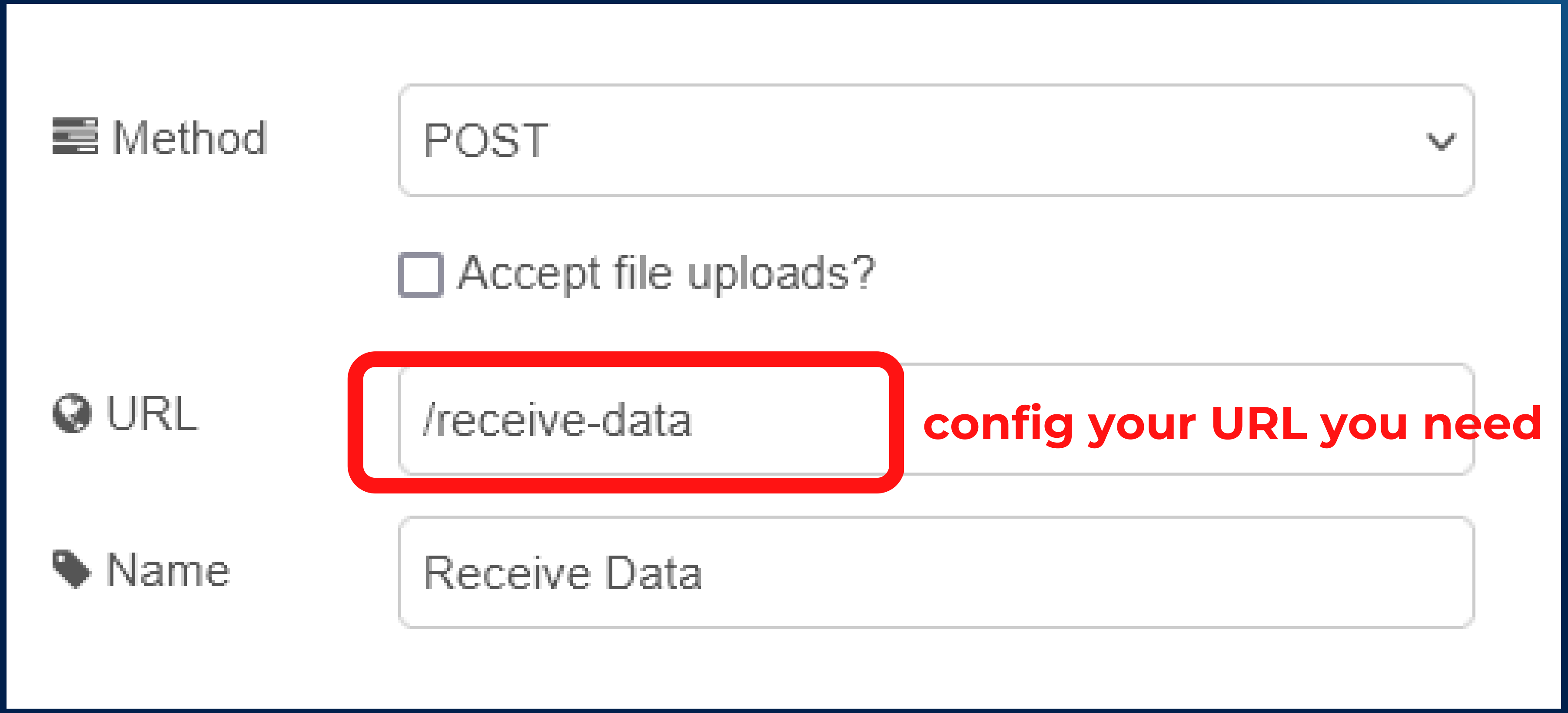
Name: Receive Data

Q3 | Configure padlet in node red





double-click in nodes Receive Data



Method: POST

☐ Accept file uploads?

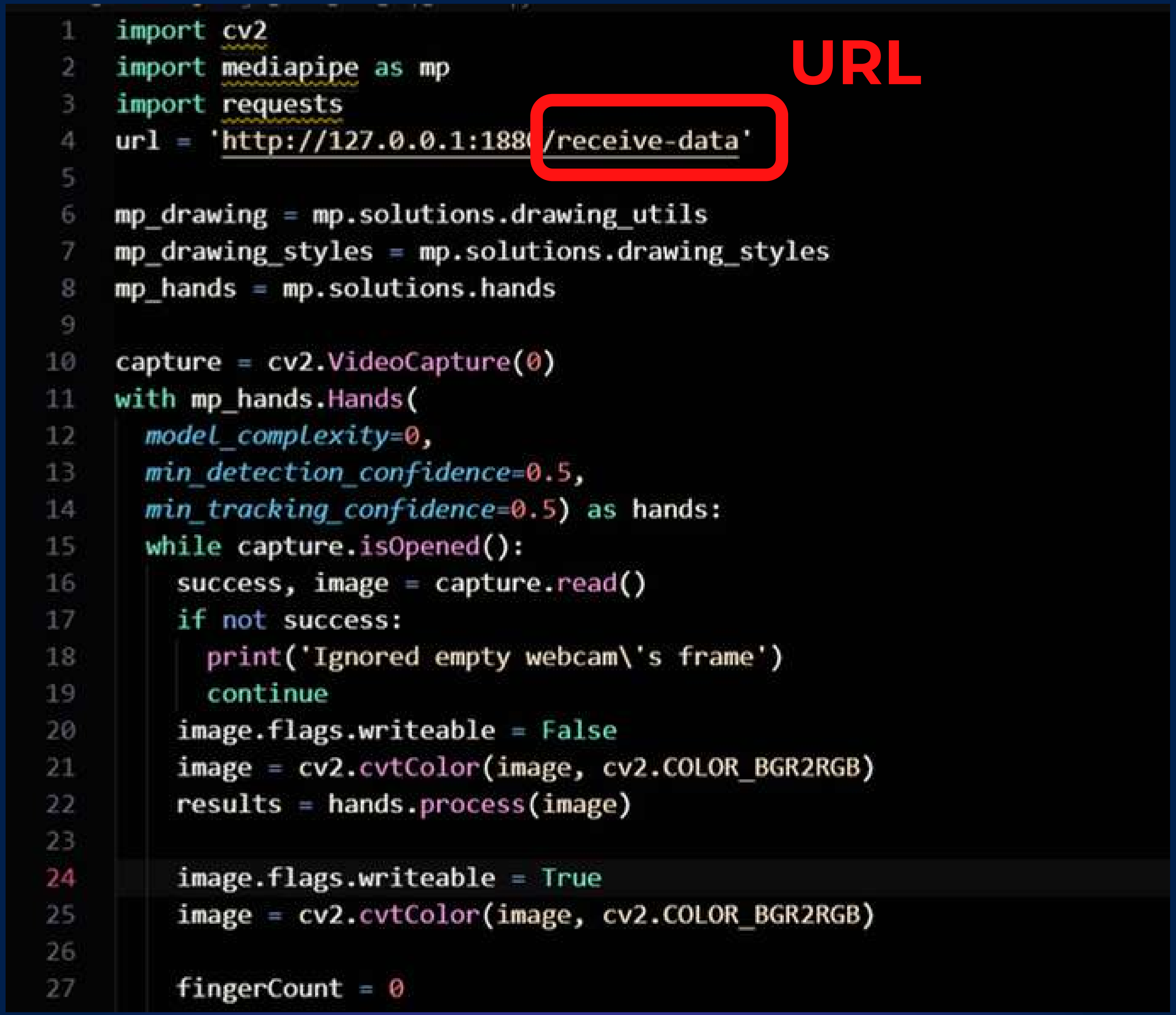
URL: /receive-data

config your URL you need

Name: Receive Data

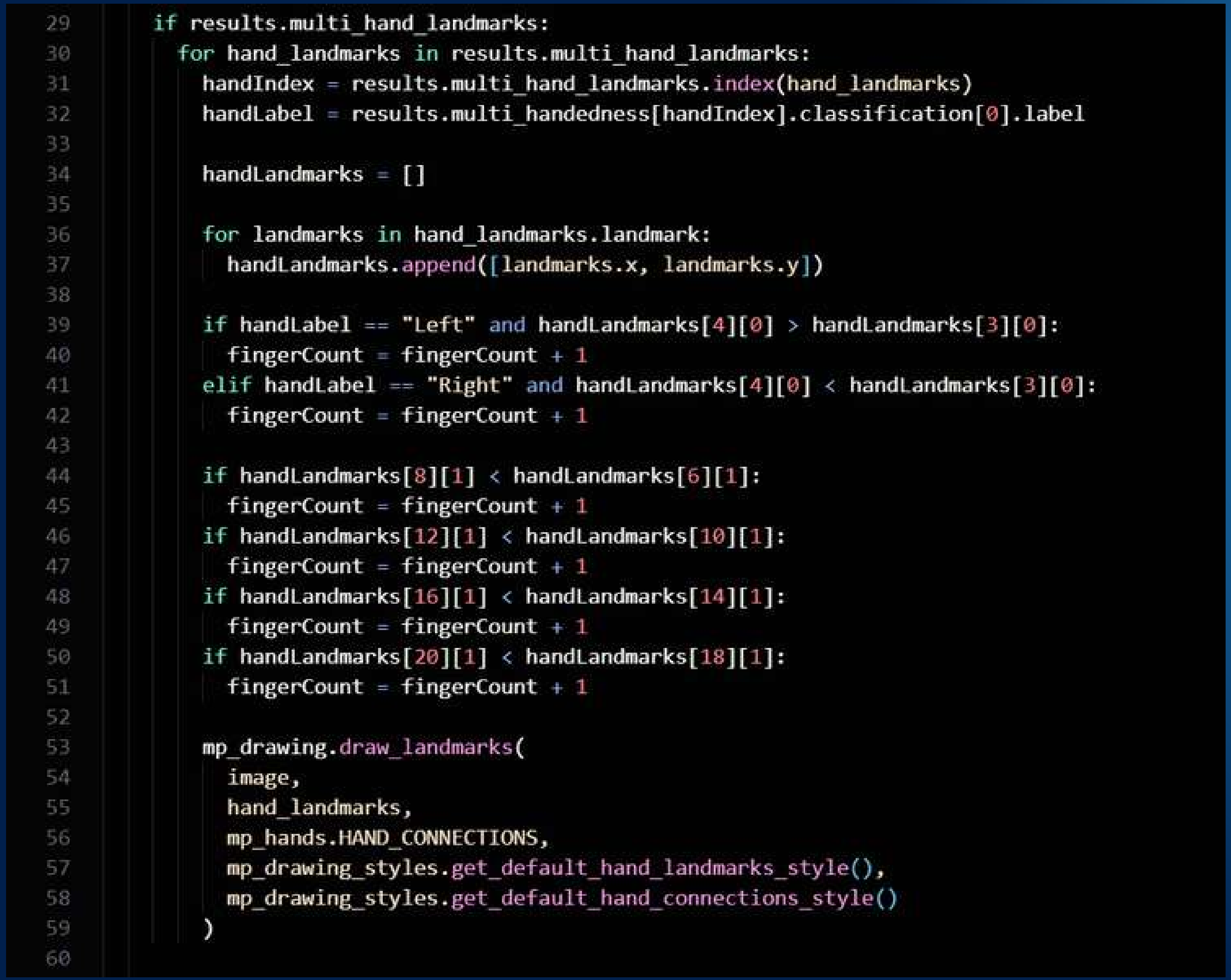
Q3 Hand Count Coding

Our Wisdom

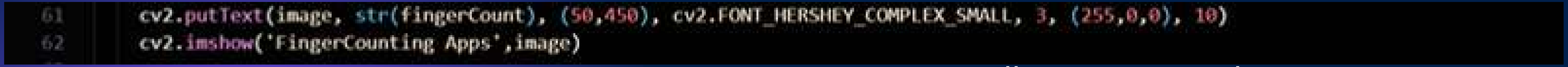


URL

```python
import cv2
import mediapipe as mp
import requests
url = 'http://127.0.0.1:1880/receive-data'

mp_drawing = mp.solutions.drawing_utils
mp_drawing_styles = mp.solutions.drawing_styles
mp_hands = mp.solutions.hands

capture = cv2.VideoCapture(0)
with mp_hands.Hands(
  model_complexity=0,
  min_detection_confidence=0.5,
  min_tracking_confidence=0.5) as hands:
  while capture.isOpened():
    success, image = capture.read()
    if not success:
      print('Ignored empty webcam\'s frame')
      continue
    image.flags.writeable = False
    image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
    results = hands.process(image)

    image.flags.writeable = True
    image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

    fingerCount = 0
```



```python
    if results.multi_hand_landmarks:
      for hand_landmarks in results.multi_hand_landmarks:
        handIndex = results.multi_hand_landmarks.index(hand_landmarks)
        handLabel = results.multi_handedness[handIndex].classification[0].label

        handLandmarks = []

        for landmarks in hand_landmarks.landmark:
          handLandmarks.append([landmarks.x, landmarks.y])

        if handLabel == "Left" and handLandmarks[4][0] > handLandmarks[3][0]:
          fingerCount = fingerCount + 1
        elif handLabel == "Right" and handLandmarks[4][0] < handLandmarks[3][0]:
          fingerCount = fingerCount + 1

        if handLandmarks[8][1] < handLandmarks[6][1]:
          fingerCount = fingerCount + 1
        if handLandmarks[12][1] < handLandmarks[10][1]:
          fingerCount = fingerCount + 1
        if handLandmarks[16][1] < handLandmarks[14][1]:
          fingerCount = fingerCount + 1
        if handLandmarks[20][1] < handLandmarks[18][1]:
          fingerCount = fingerCount + 1

        mp_drawing.draw_landmarks(
          image,
          hand_landmarks,
          mp_hands.HAND_CONNECTIONS,
          mp_drawing_styles.get_default_hand_landmarks_style(),
          mp_drawing_styles.get_default_hand_connections_style()
        )
```



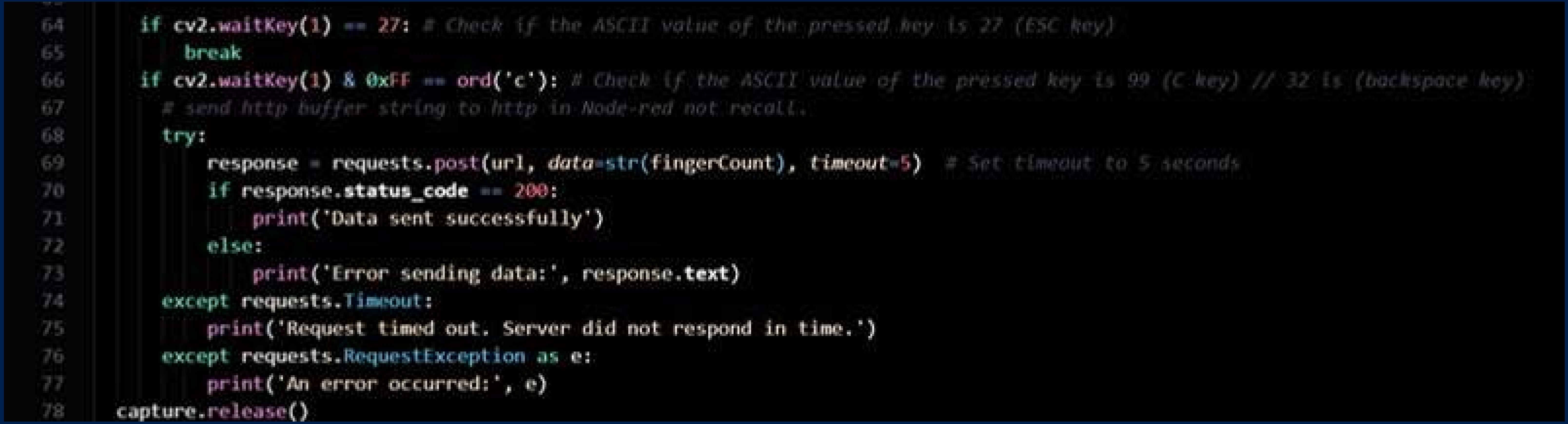
```python
    cv2.putText(image, str(fingerCount), (50,450), cv2.FONT_HERSHEY_COMPLEX_SMALL, 3, (255,0,0), 10)
    cv2.imshow('FingerCounting Apps',image)
```

youtube : https://www.youtube.com/watch?app=desktop&v=1iq9FxLxBIY

Q4

FingerCount Send To NodeRed Coding

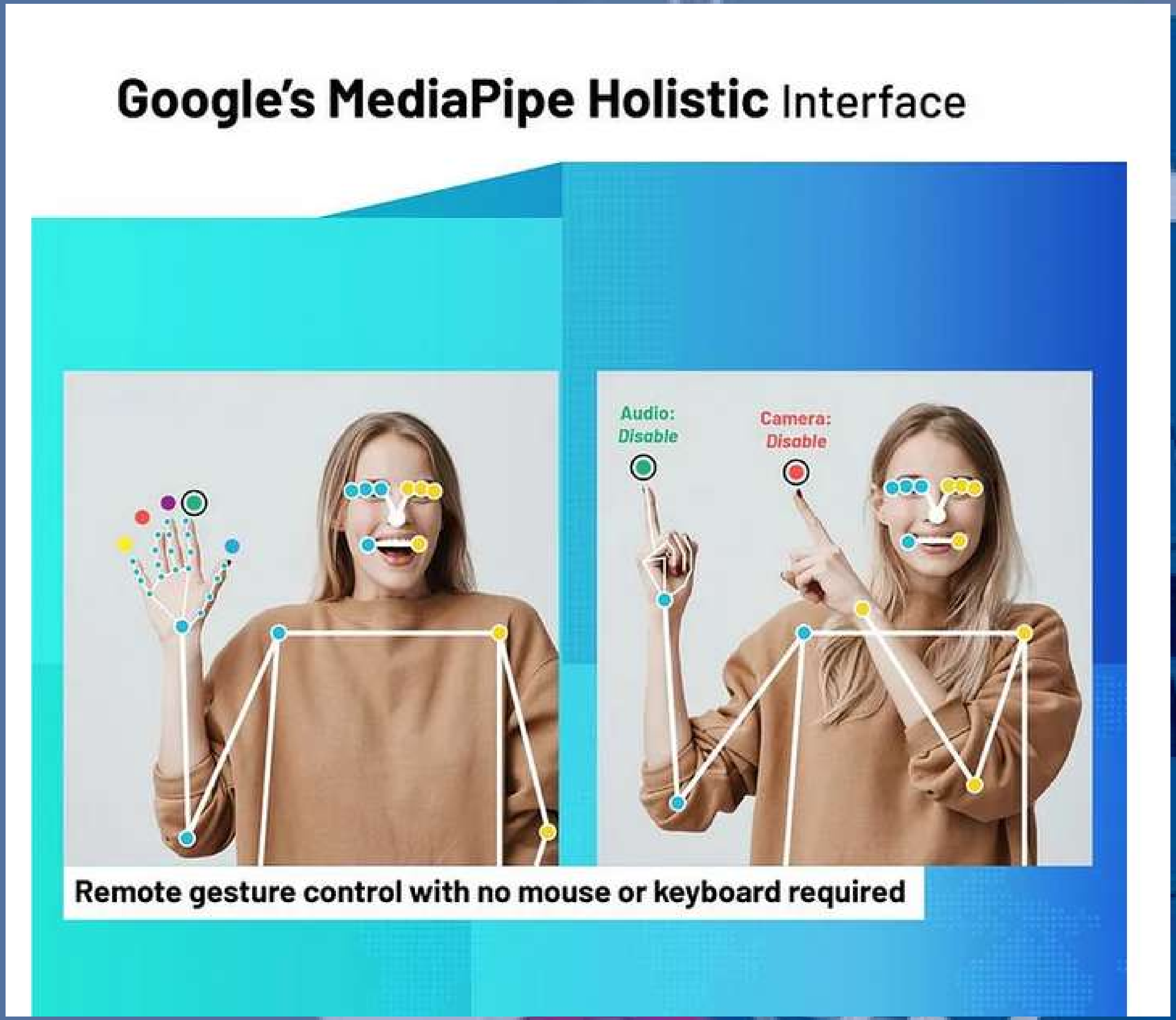
youtube : https://www.youtube.com/watch?app=desktop&v=1iq9FxLxBIY



```
 if cv2.waitKey(1) == 27: # Check if the ASCII value of the pressed key is 27 (ESC key)
   break
 if cv2.waitKey(1) & 0xFF == ord('c'): # Check if the ASCII value of the pressed key is 99 (C key) // 32 is (backspace key)
  # send http buffer string to http in Node-red not recall.
  try:
    response = requests.post(url, data=str(fingerCount), timeout=5)  # Set timeout to 5 seconds
    if response.status_code == 200:
      print('Data sent successfully')
    else:
      print('Error sending data:', response.text)
  except requests.Timeout:
    print('Request timed out. Server did not respond in time.')
  except requests.RequestException as e:
    print('An error occurred:', e)
capture.release()
```

github code : https://github.com/ThedBoyZ/CodeBotix_Camp_Image

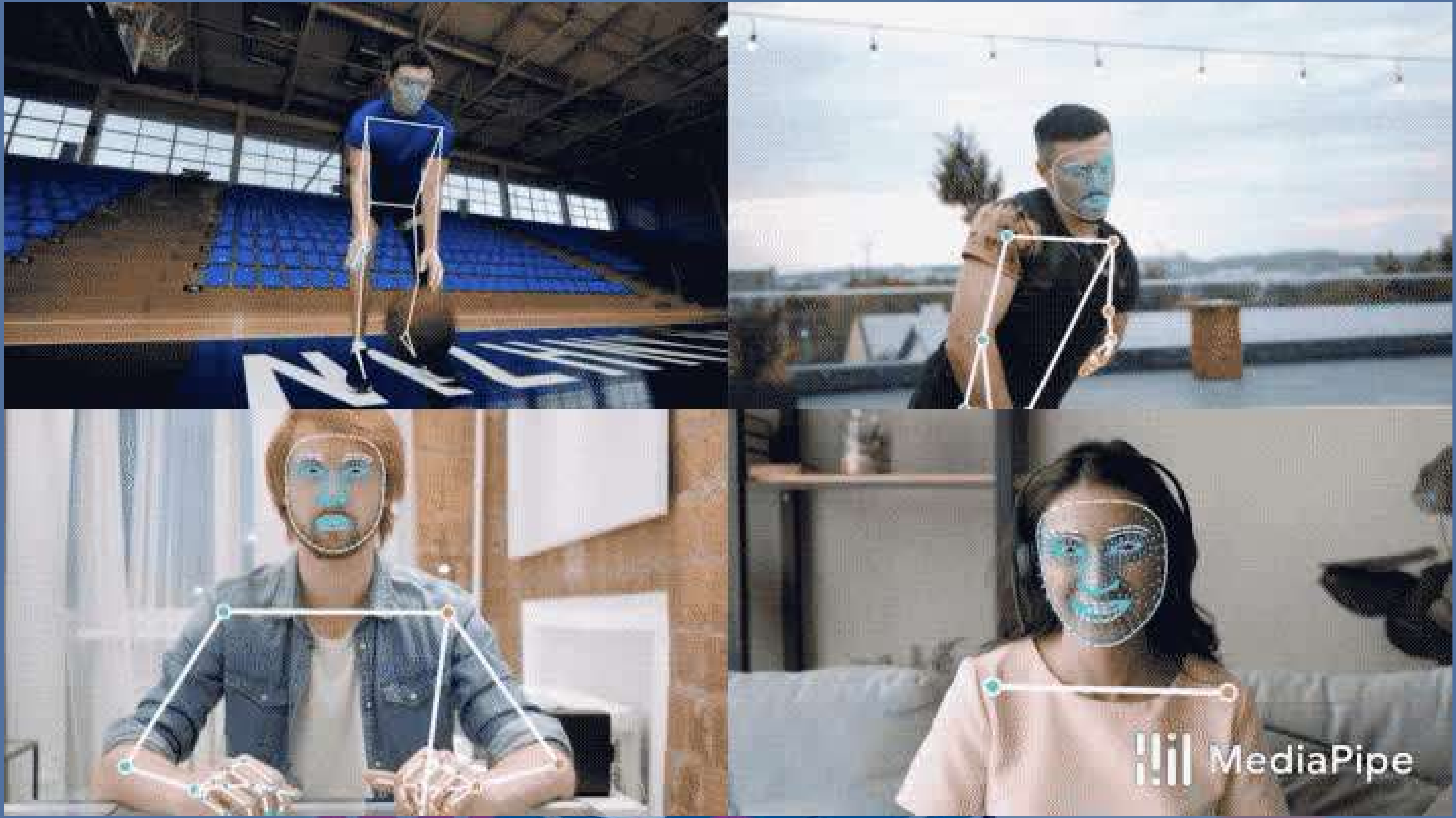
Intelligence


Google's MediaPipe Holistic Interface
Audio: Disable
Camera: Disable
Remote gesture control with no mouse or keyboard required

This gesture control and command technique will take us to the next level. And allow us to use new innovations that other devices cannot do

It can be tried on MediaPipe Holistic Interface from Google at:

https://mediapipe.dev/demo/holistic_remote/



https://mediapipe.dev/demo/holistic_remote/

Holistic demo

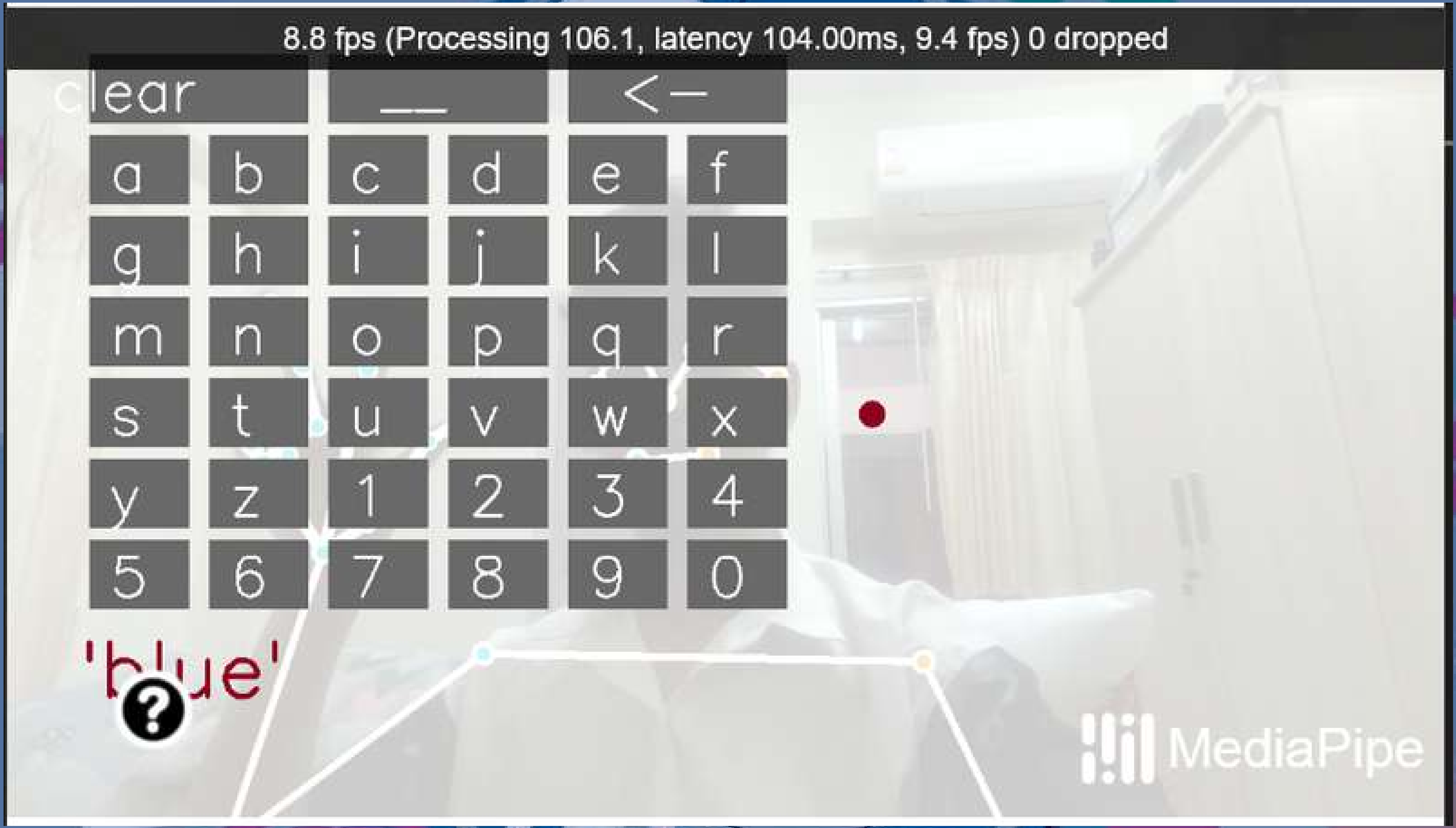
โหมดการใช้งานต่างๆ

1 — 1 นิ้ว มือซ้าย หรือ ขวา

2 — 3 นิ้ว มือซ้าย

3 — 3 นิ้ว มือขวา

Holistic demo

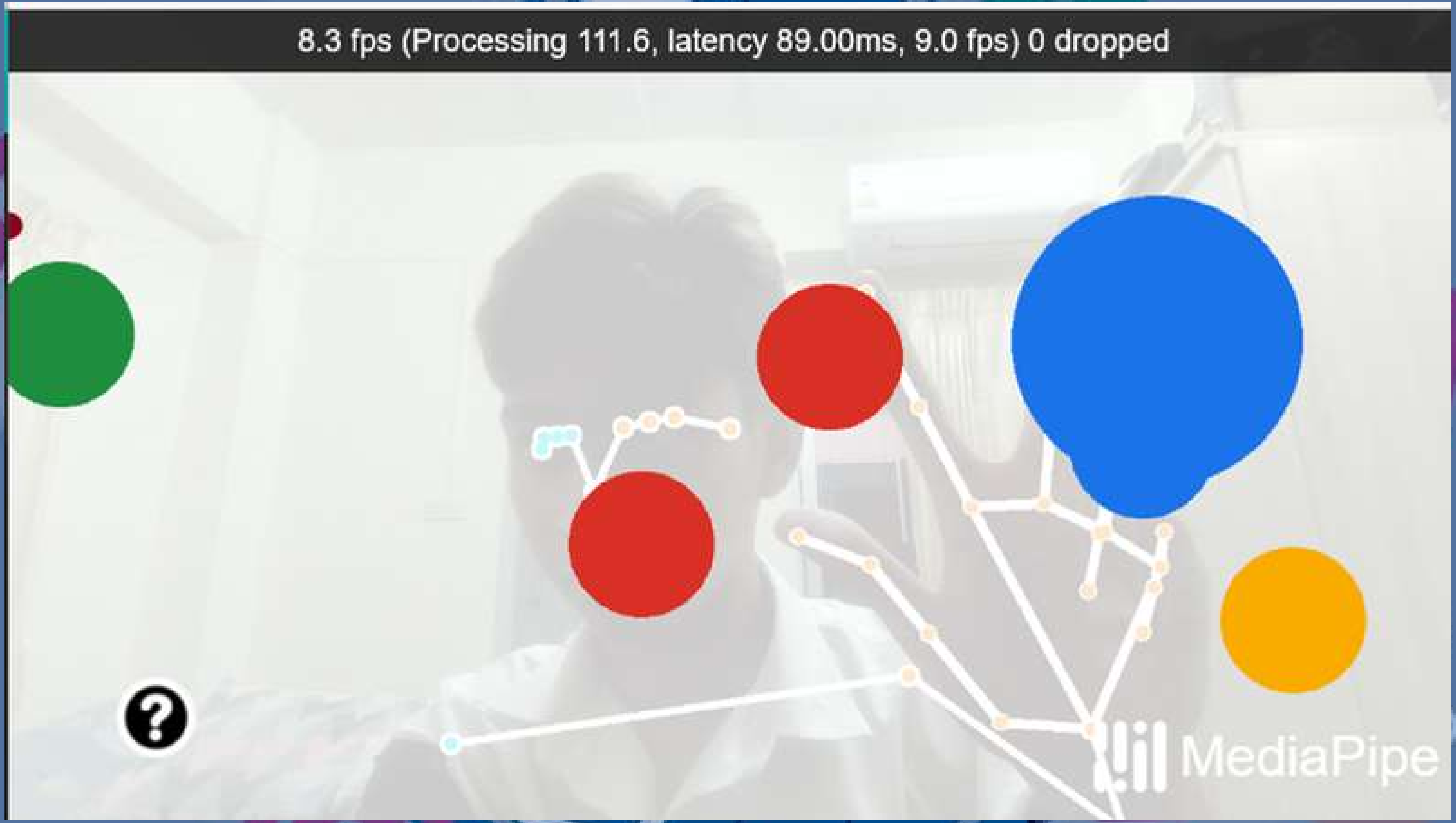


```
8.8 fps (Processing 106.1, latency 104.00ms, 9.4 fps) 0 dropped
```

'blue'

ลองเขียนชื่อตัวเอง เป็นภาษาอังกฤษ

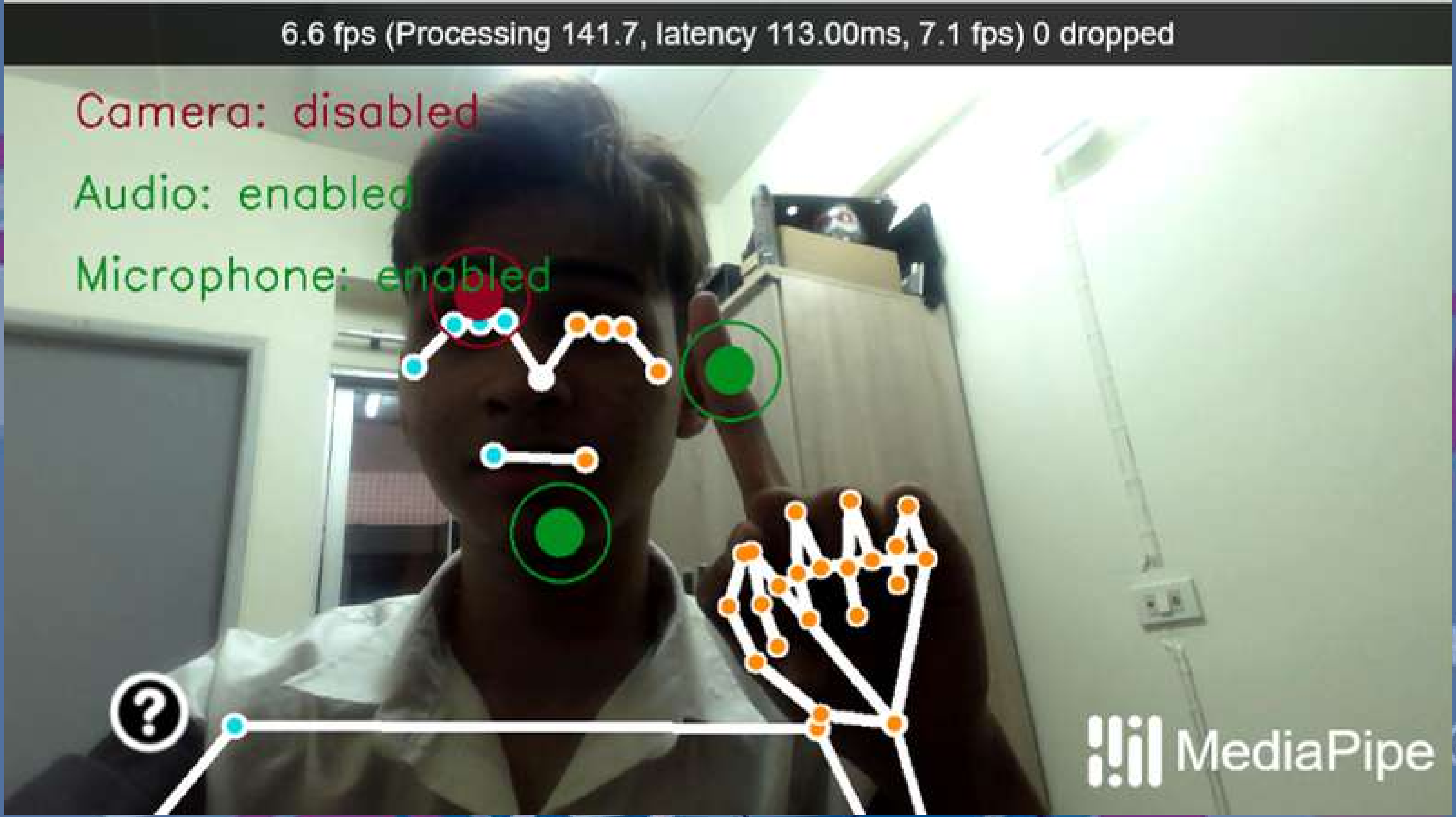
Holistic demo



8.3 fps (Processing 111.6, latency 89.00ms, 9.0 fps) 0 dropped

สามารถใช้มือแทน เมาส์ในการลากกรุ๊ปสีจัดหมวดหมู่ได้

Holistic demo



6.6 fps (Processing 141.7, latency 113.00ms, 7.1 fps) 0 dropped

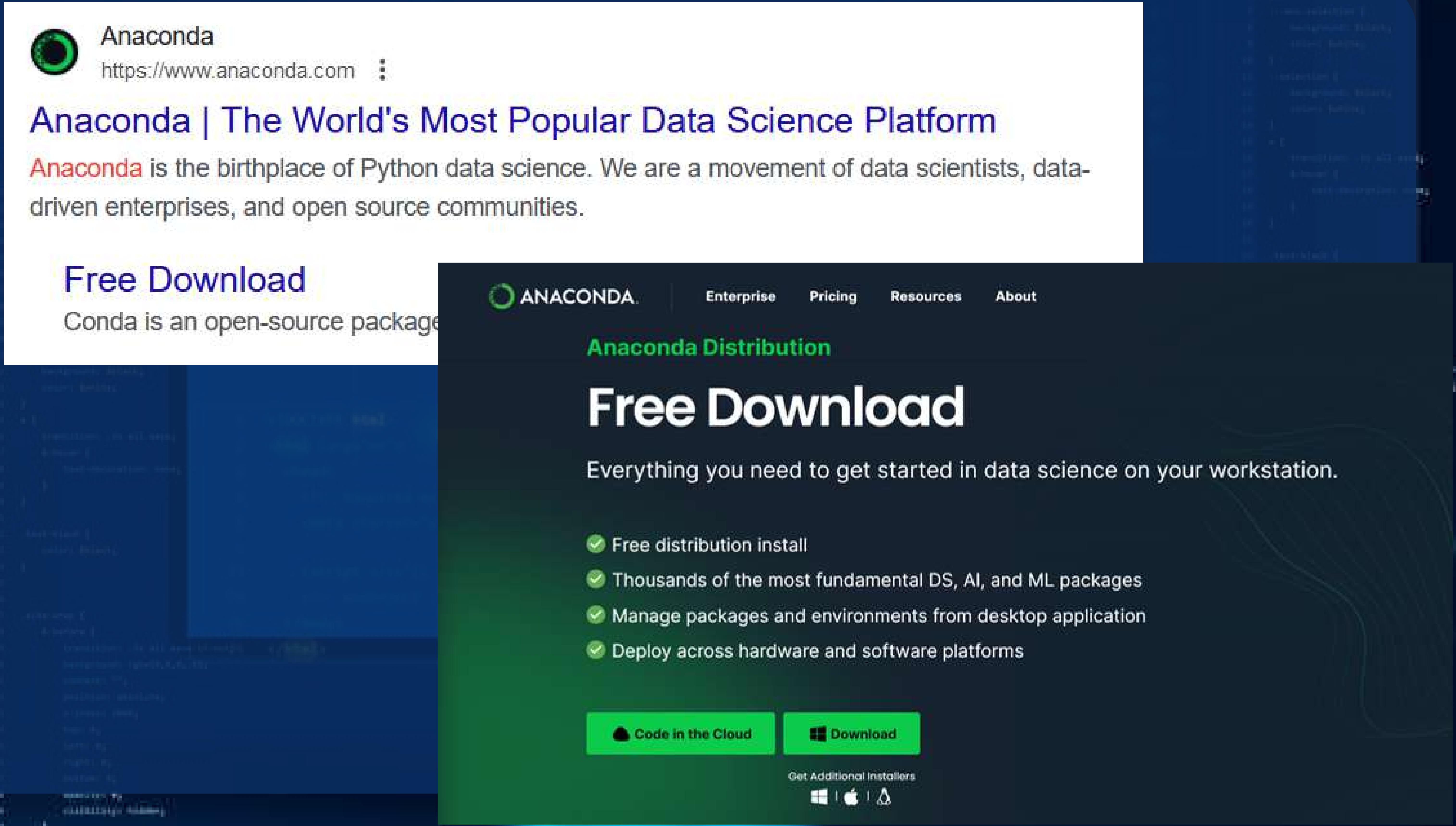
Camera: disabled

Audio: enabled

Microphone: enabled

Disable / Enable mode

Anaconda Navigator



Anaconda

https://www.anaconda.com ⋮

Anaconda | The World's Most Popular Data Science Platform

Anaconda is the birthplace of Python data science. We are a movement of data scientists, data-driven enterprises, and open source communities.

Free Download

Conda is an open-source package

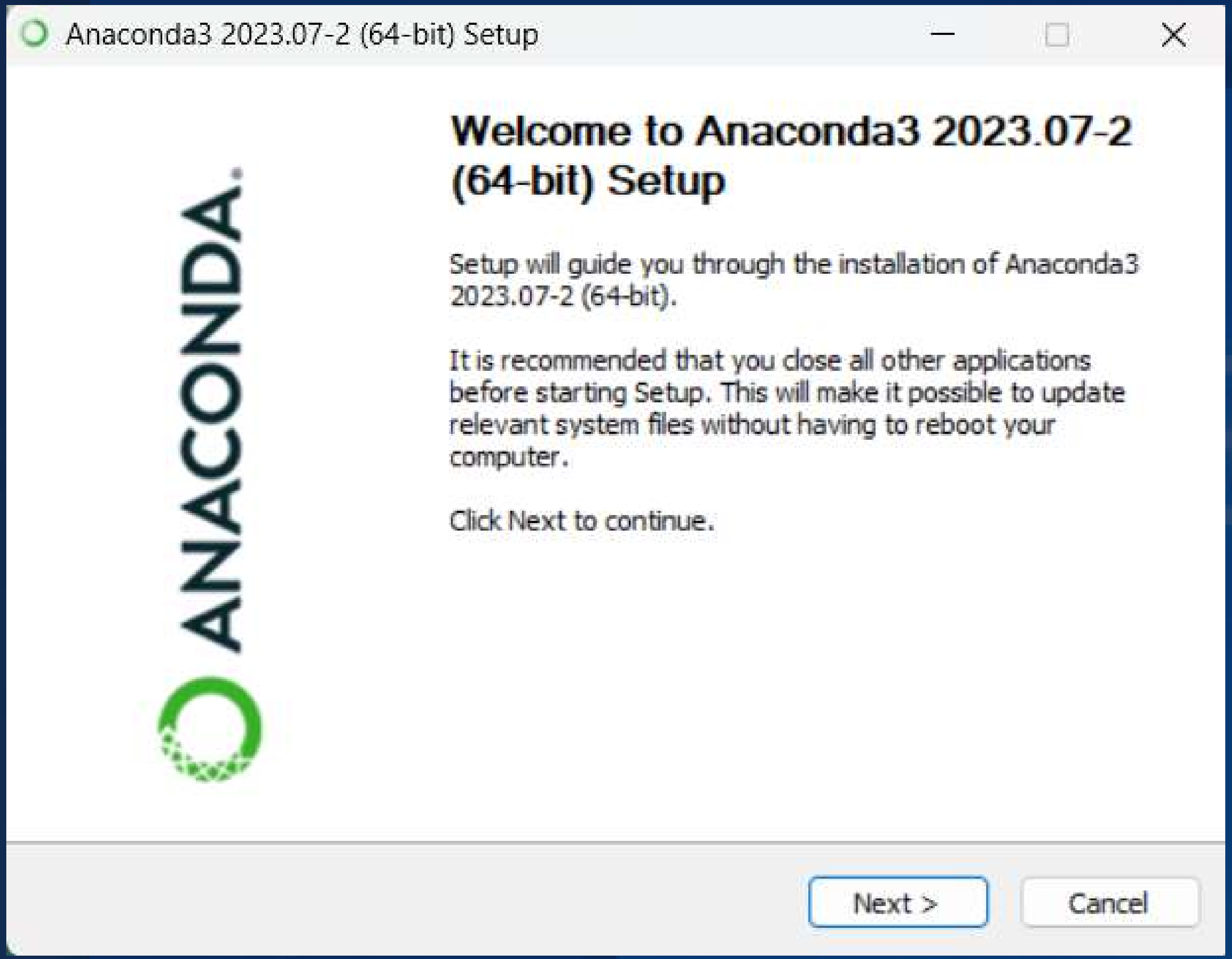
Anaconda Distribution

Free Download

Everything you need to get started in data science on your workstation.

- ✓ Free distribution install
- ✓ Thousands of the most fundamental DS, AI, and ML packages
- ✓ Manage packages and environments from desktop application
- ✓ Deploy across hardware and software platforms

Anaconda Navigator



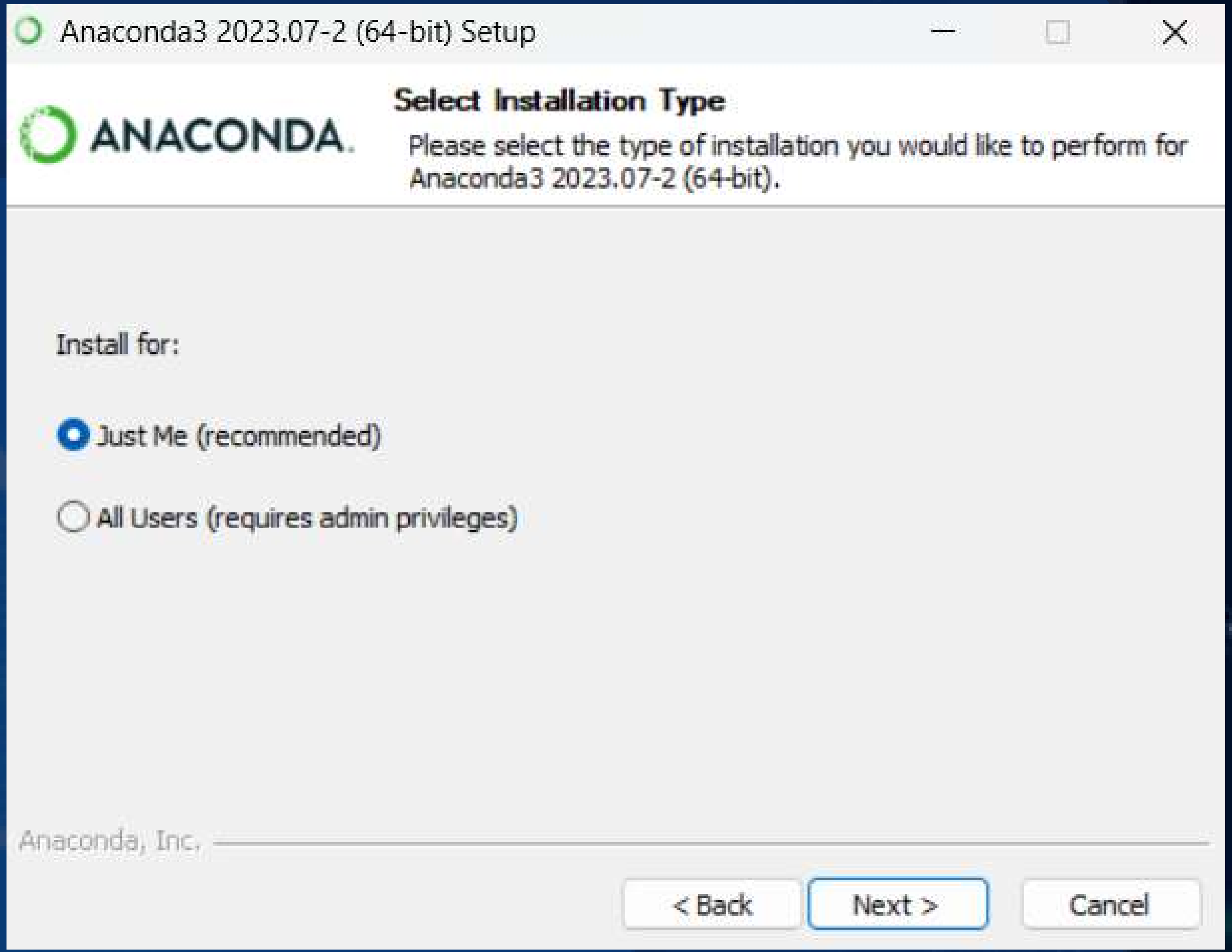
Anaconda3 2023.07-2 (64-bit) Setup

Welcome to Anaconda3 2023.07-2 (64-bit) Setup

Setup will guide you through the installation of Anaconda3 2023.07-2 (64-bit).

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.



Anaconda3 2023.07-2 (64-bit) Setup

Select Installation Type

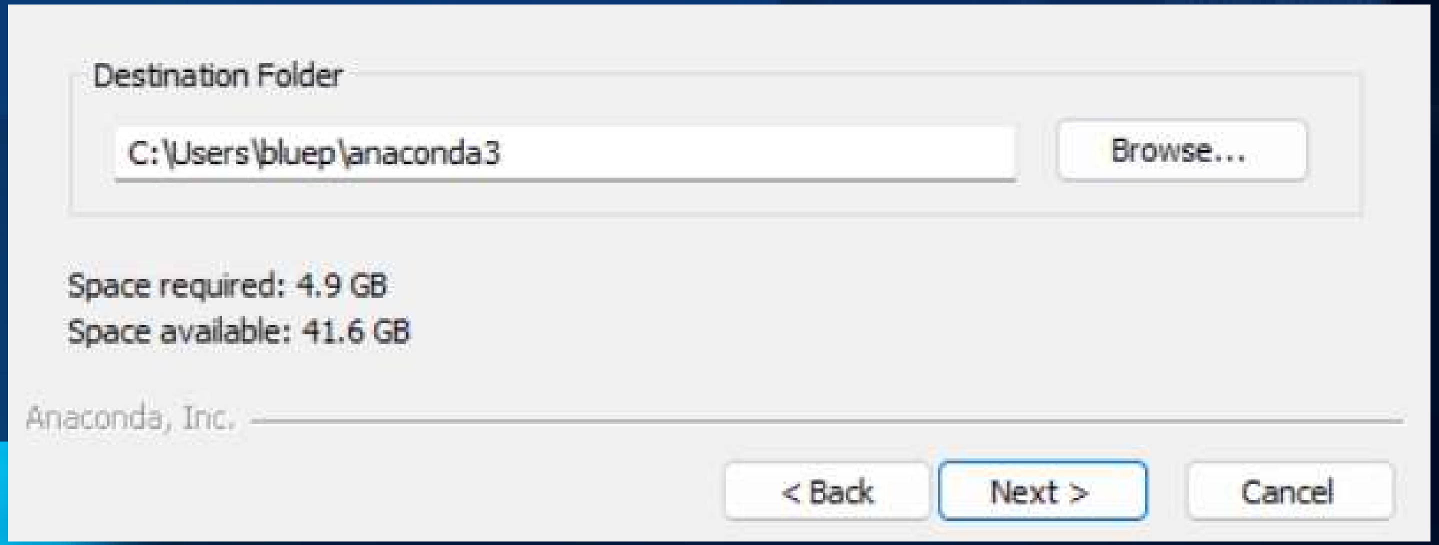
Please select the type of installation you would like to perform for Anaconda3 2023.07-2 (64-bit).

Install for:

● Just Me (recommended)

○ All Users (requires admin privileges)

Anaconda, Inc.



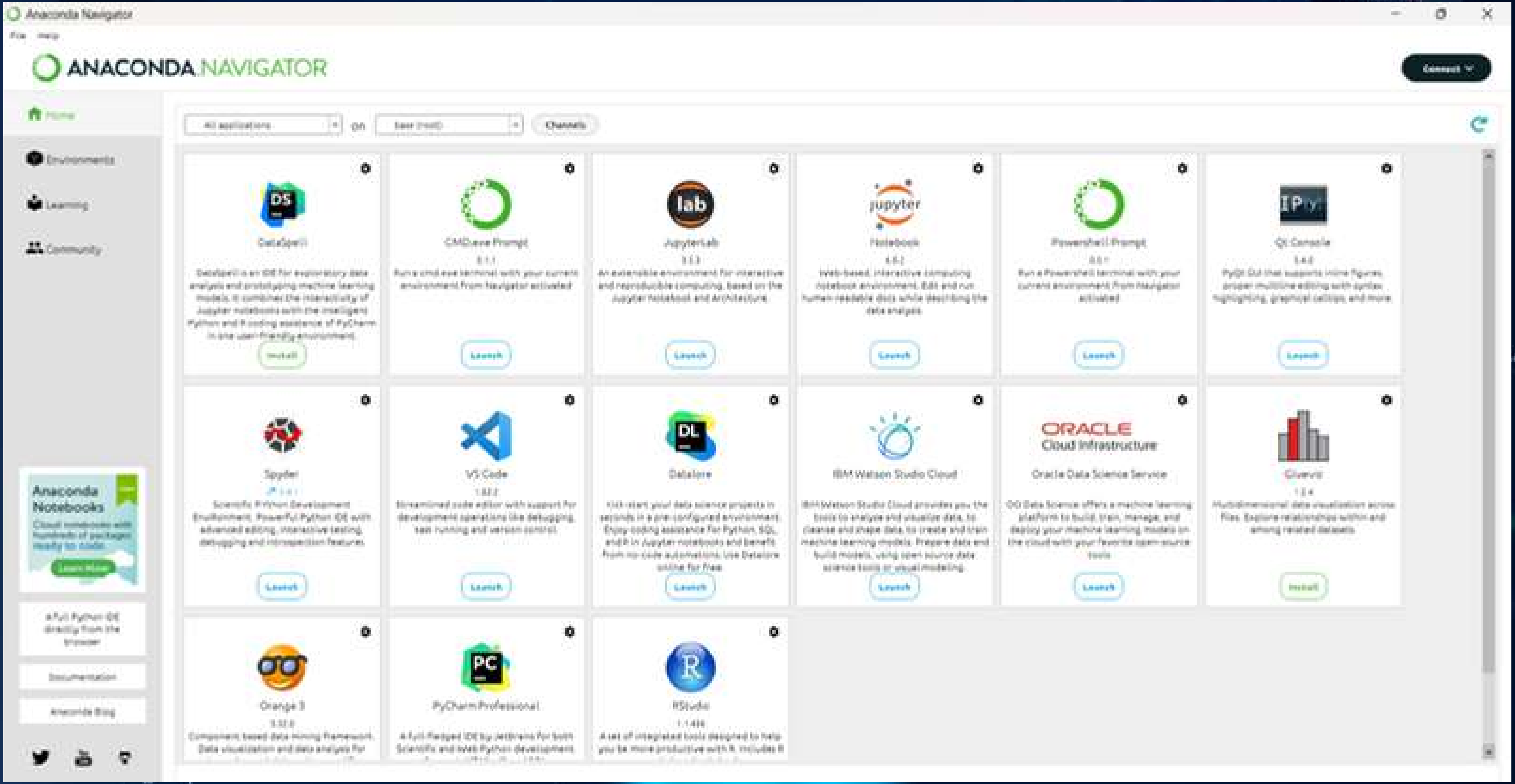
Destination Folder

C:\Users\bluep\anaconda3

Space required: 4.9 GB
Space available: 41.6 GB

Anaconda, Inc.

Anaconda Navigator



DataSpell

DataSpell is an IDE for exploratory data analysis and prototyping machine learning models. It combines the interactivity of Jupyter notebooks with the intelligent Python and R coding assistance of PyCharm in one user-friendly environment.

CMD.exe Prompt

0.1.1

Run a cmd.exe terminal with your current environment from Navigator activated

JupyterLab

3.5.3

An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

Notebook

6.5.2

Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.

Powershell Prompt

0.0.1

Run a Powershell terminal with your current environment from Navigator activated

Qt Console

5.4.0

PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.

Spyder

5.4.1

Scientific PYthon Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features.

VS Code

1.82.2

Streamlined code editor with support for development operations like debugging, task running and version control.

Datalore

Kick-start your data science projects in seconds in a pre-configured environment. Enjoy coding assistance for Python, SQL, and R in Jupyter notebooks and benefit from no-code automations. Use Datalore online for free.

IBM Watson Studio Cloud

IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.

Oracle Data Science Service

OCI Data Science offers a machine learning platform to build, train, manage, and deploy your machine learning models on the cloud with your favorite open-source tools

Glueviz

1.2.4

Multidimensional data visualization across files. Explore relationships within and among related datasets.

Orange 3

3.32.0

Component based data mining Framework. Data visualization and data analysis for

PyCharm Professional

A full-fledged IDE by JetBrains for both Scientific and Web Python development.

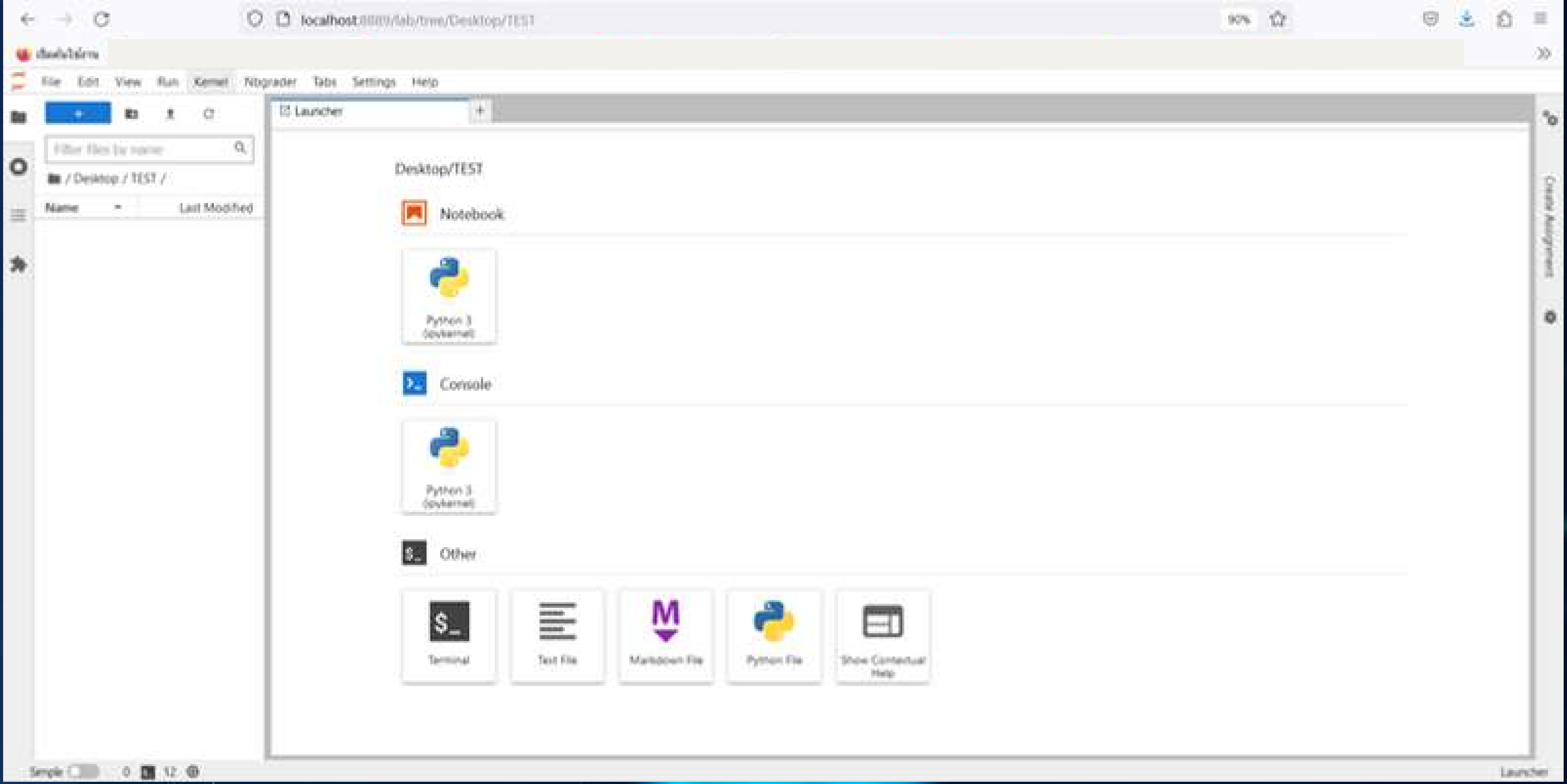
RStudio

1.1.456

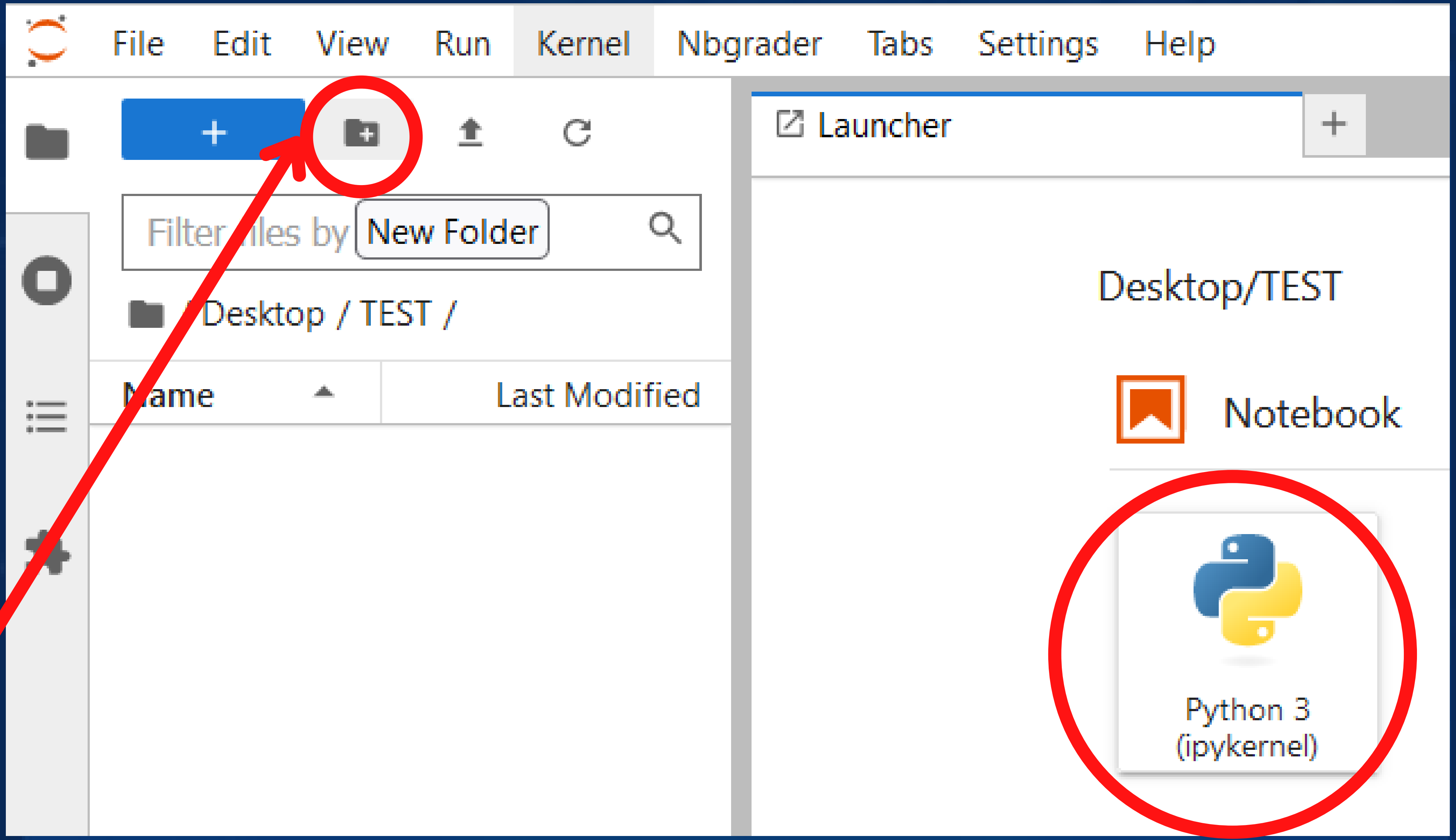
A set of integrated tools designed to help you be more productive with R. Includes R

Anaconda Notebooks
Cloud notebooks with hundreds of packages ready to code.
Learn More
A full Python IDE directly from the browser
Documentation
Anaconda Blog

Anaconda Navigator



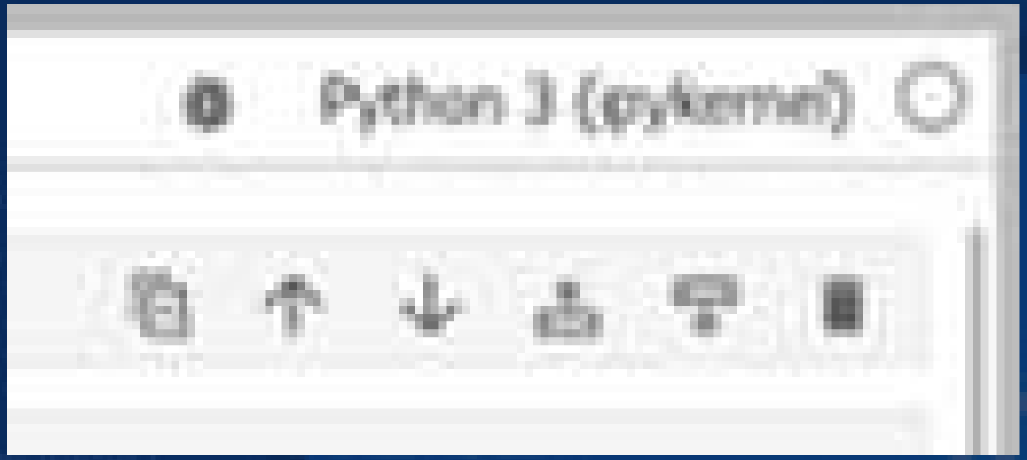
Anaconda Navigator



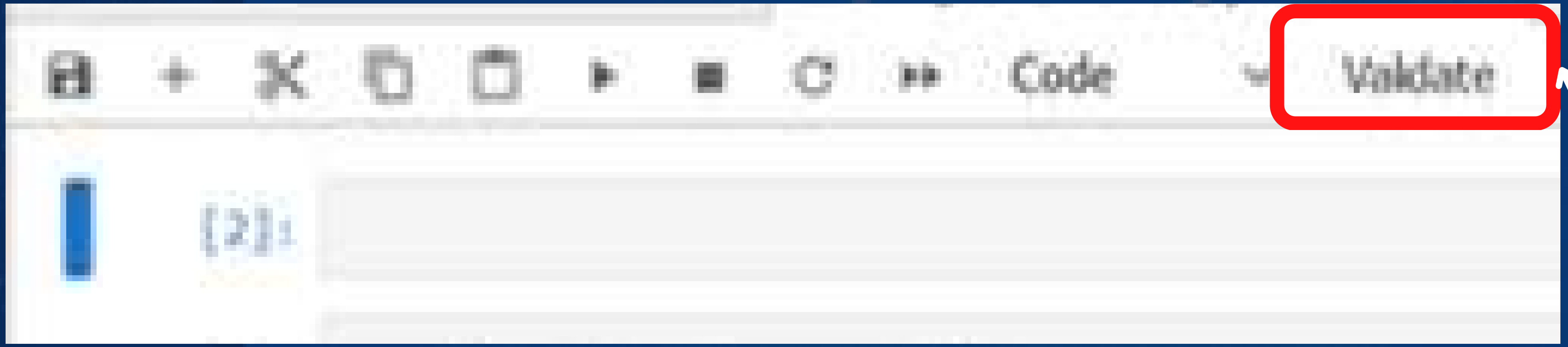
สร้าง Floder ใหม่

สร้าง สร้างไฟล์ .ipynb เพื่อเขียน
โปรแกรมใน jupyter notebook

Anaconda Navigator



python 3 (ipykernel) ในการรันโค้ด



ไว้สำหรับการทดสอบ save ไฟล์
ตรวจสอบความถูกต้องทั้งหมด

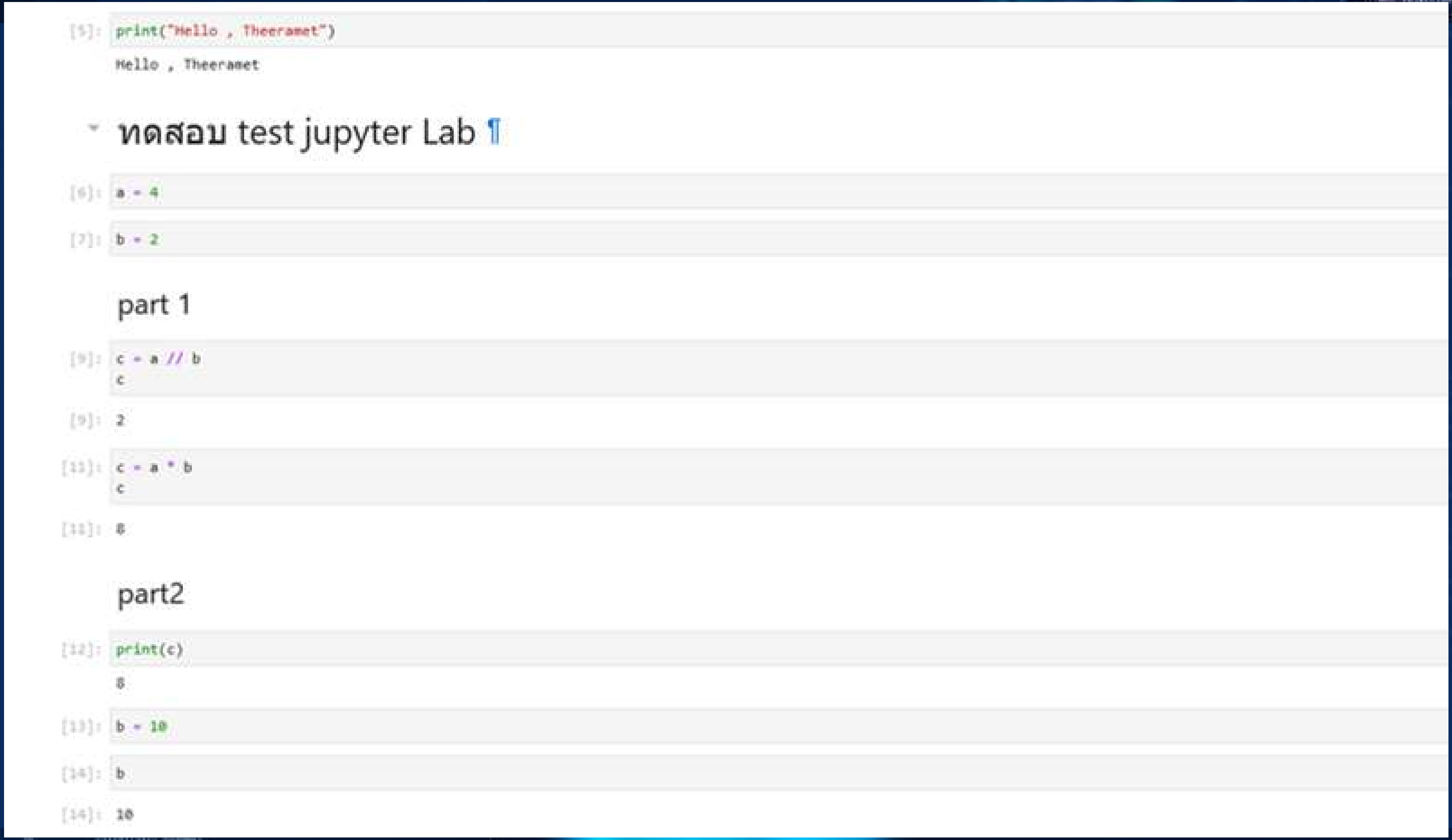
Jupyter Notebook

image processing

ch1_helloworld.ipynb

Jupyter Notebook

image processing



```
[5]: print("Hello , Theeramet")

     Hello , Theeramet
```

ทดสอบ test jupyter Lab ¶

```
[6]: a = 4

[7]: b = 2
```

part 1

```
[9]: c = a // b
     c

[9]: 2

[11]: c = a * b
      c

[11]: 8
```

part2

```
[12]: print(c)

      8

[13]: b = 10

[14]: b

[14]: 10
```

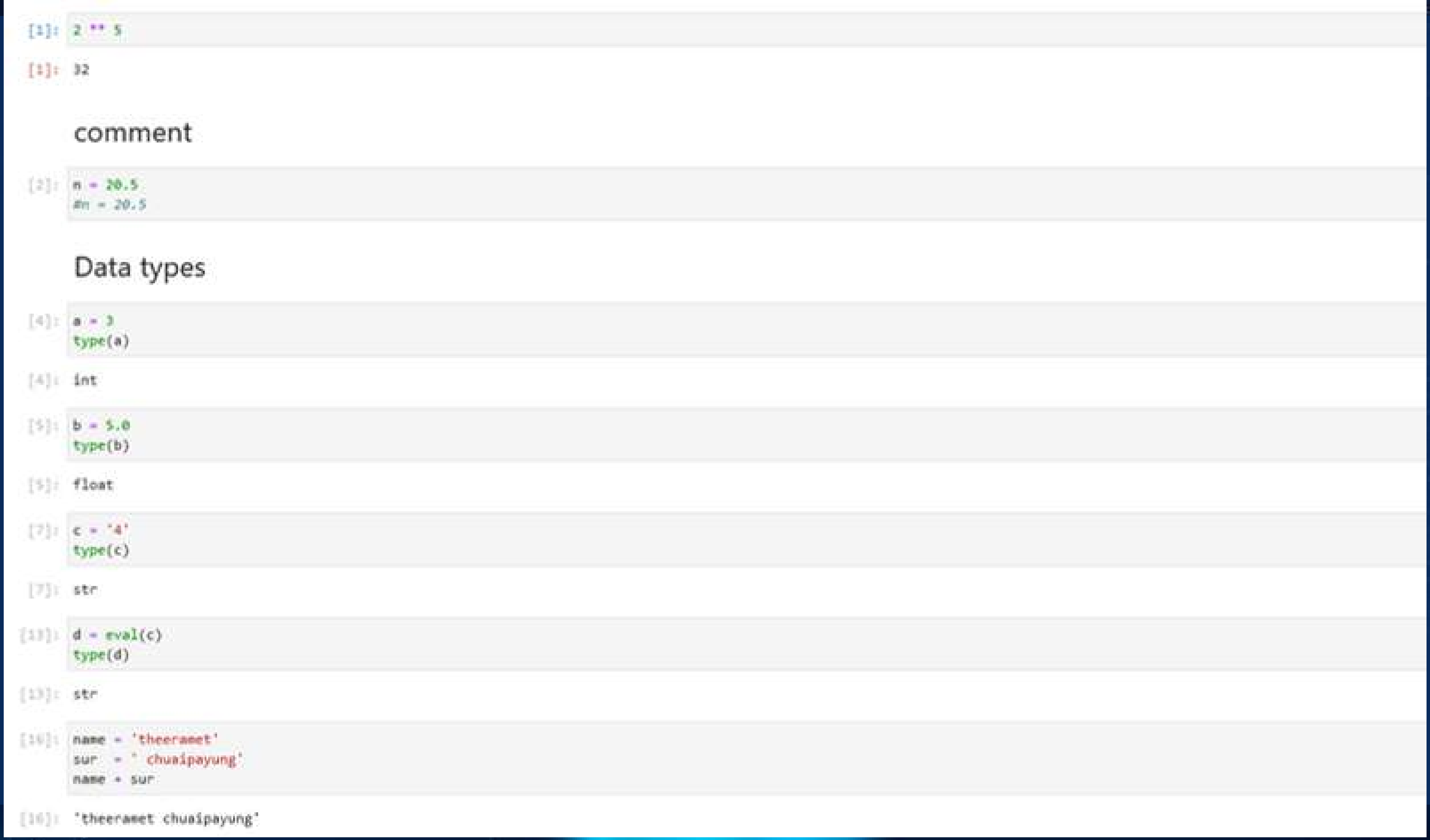
Jupyter Notebook

image processing

ch2_output_python.ipynb

Jupyter Notebook

image processing



```
[1]: 2 ** 5

[1]: 32
```

comment

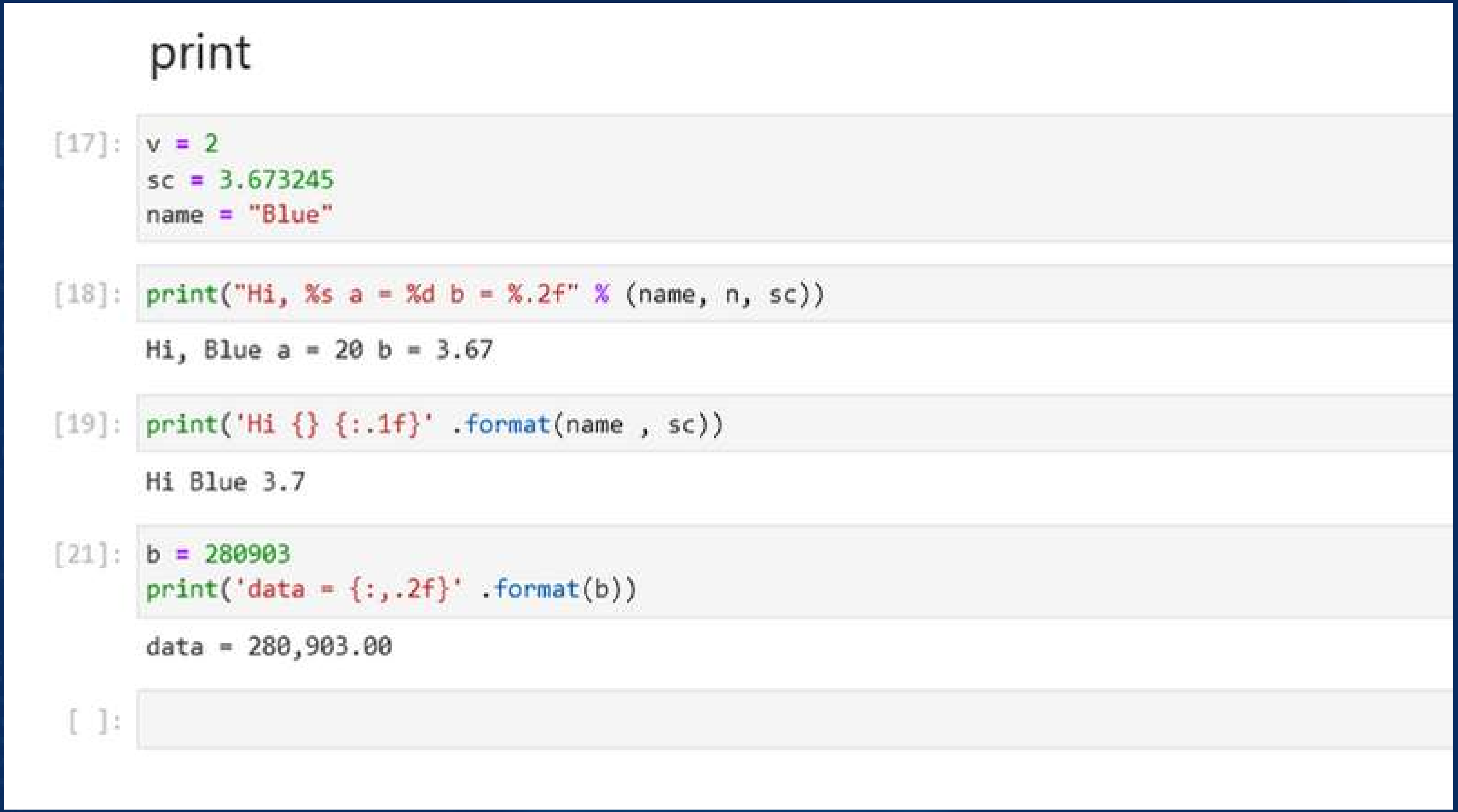
```
[2]: n = 20.5
     #n = 20.5
```

Data types

```
[4]: a = 3
     type(a)

[4]: int

[5]: b = 5.0
     type(b)

[5]: float

[7]: c = '4'
     type(c)

[7]: str

[13]: d = eval(c)
      type(d)

[13]: str

[16]: name = 'theeramet'
      sur  = ' chuaipayung'
      name + sur

[16]: 'theeramet chuaipayung'
```

Jupyter Notebook

image processing

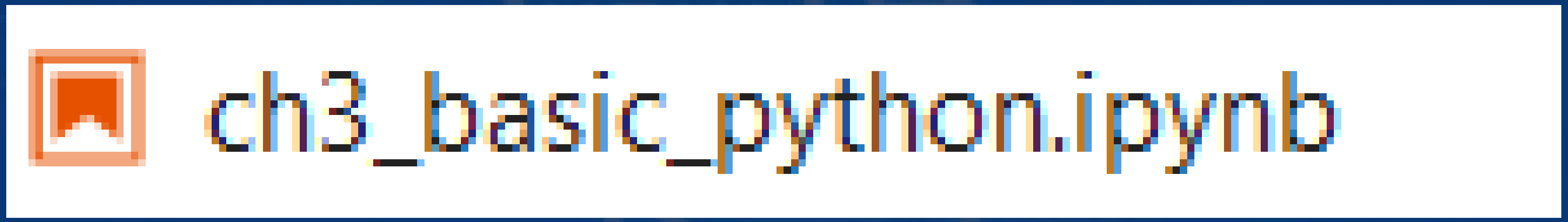


print

```
[17]: v = 2
      sc = 3.673245
      name = "Blue"

[18]: print("Hi, %s a = %d b = %.2f" % (name, n, sc))

      Hi, Blue a = 20 b = 3.67

[19]: print('Hi {} {:.1f}' .format(name , sc))

      Hi Blue 3.7

[21]: b = 280903
      print('data = {:,.2f}' .format(b))

      data = 280,903.00

[ ]:
```

Jupyter Notebook

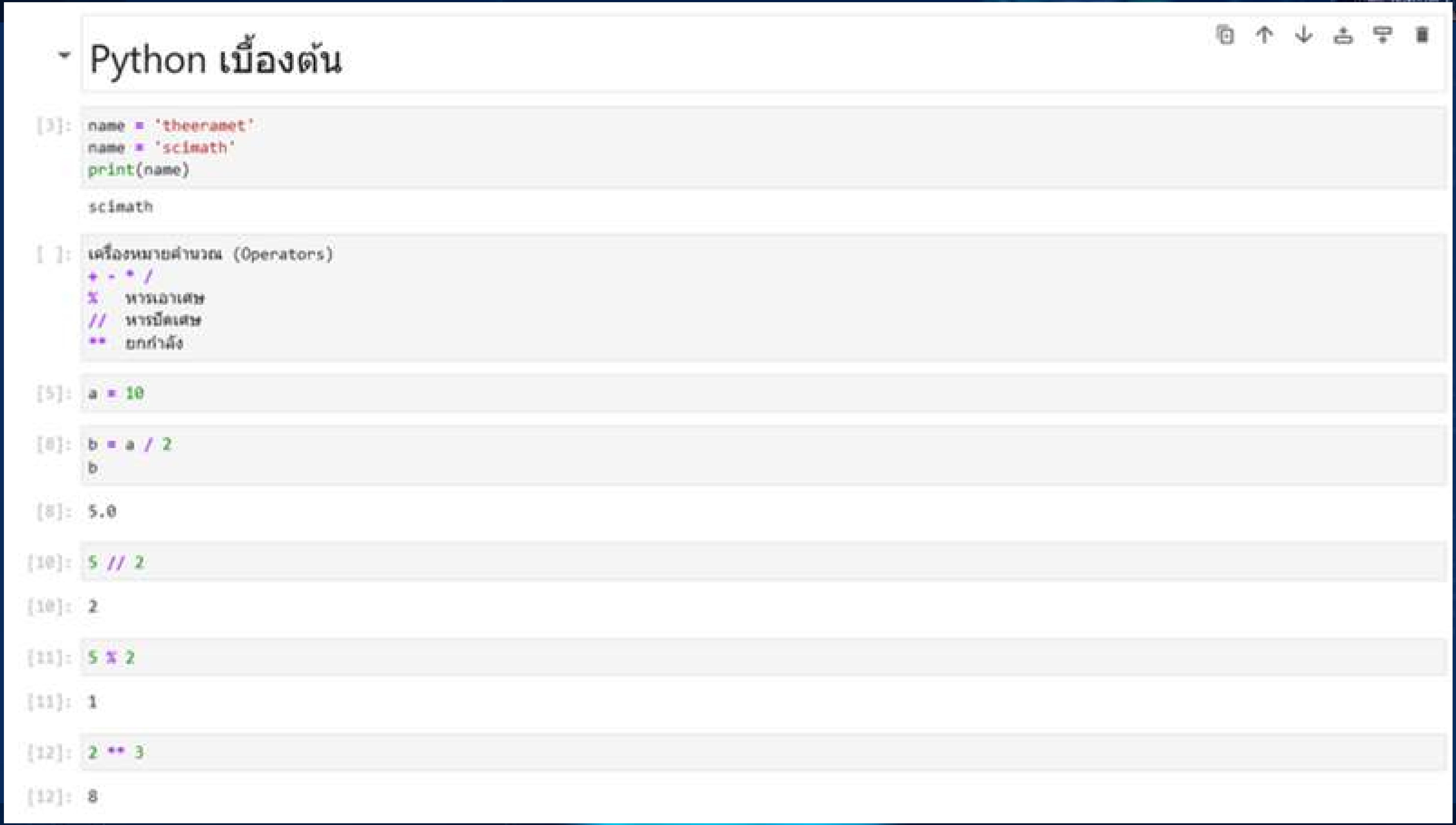
image processing



ch3_basic_python.ipynb

Jupyter Notebook

image processing

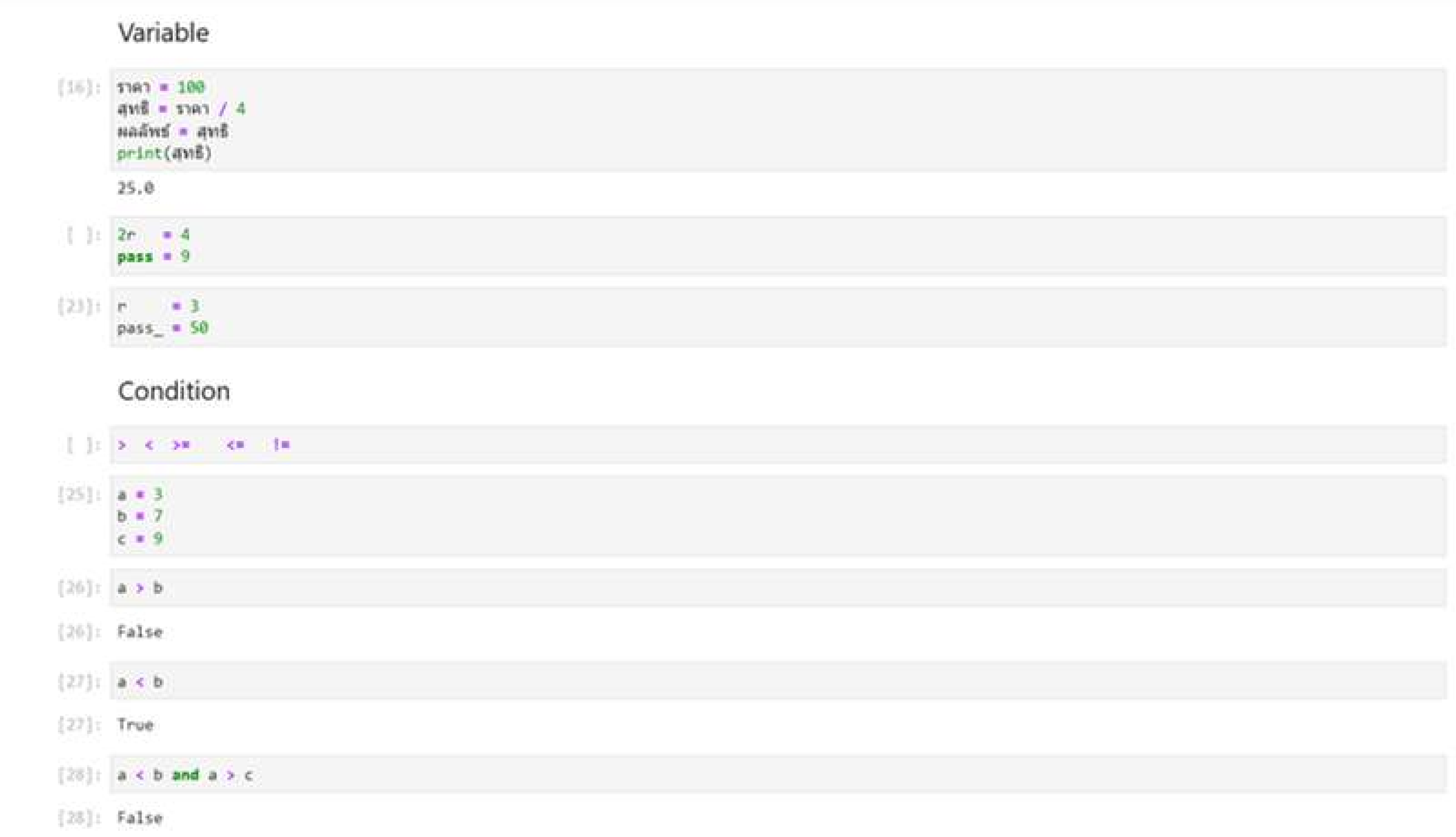


Python เบื้องต้น

```
[3]: name = 'theeramet'
     name = 'scimath'
     print(name)

     scimath

[ ]: เครื่องหมายคำนวณ (Operators)
     + - * /
     %   หารเอาเศษ
     //  หารปัดเศษ
     **  ยกกำลัง

[5]: a = 10

[8]: b = a / 2
     b

[8]: 5.0

[10]: 5 // 2

[10]: 2

[11]: 5 % 2

[11]: 1

[12]: 2 ** 3

[12]: 8
```

Jupyter Notebook

image processing



Variable

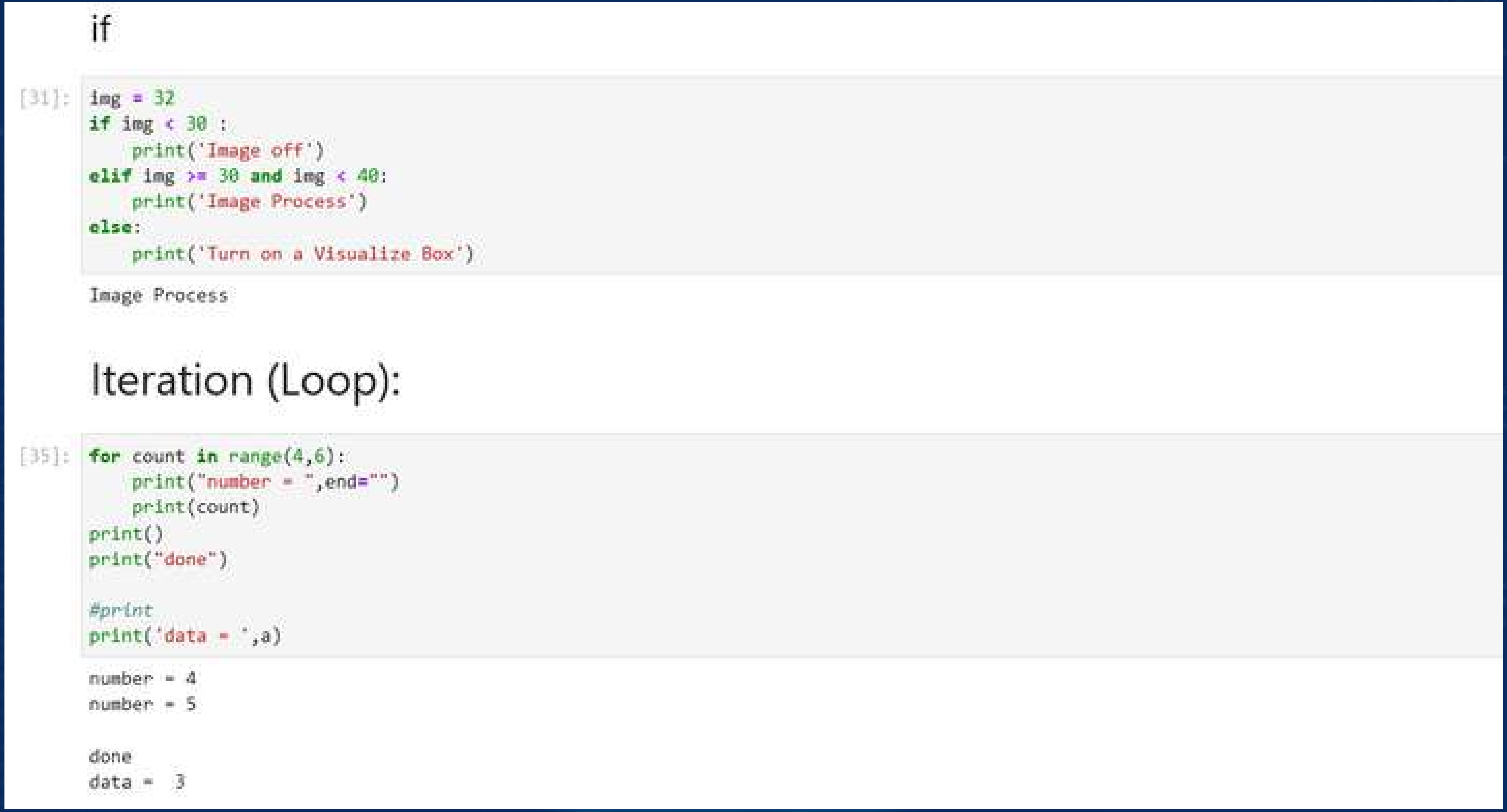
```
[16]: ราคา = 100
      สุทธิ = ราคา / 4
      ผลลัพธ์ = สุทธิ
      print(สุทธิ)

      25.0

[ ]:  2r   = 4
      pass = 9

[23]: r     = 3
      pass_ = 50
```

Condition

```
[ ]:  >  <  >=   <=   !=

[25]: a = 3
      b = 7
      c = 9

[26]: a > b

[26]: False

[27]: a < b

[27]: True

[28]: a < b and a > c

[28]: False
```

Jupyter Notebook

image processing



if

```
[31]: img = 32
      if img < 30 :
          print('Image off')
      elif img >= 30 and img < 40:
          print('Image Process')
      else:
          print('Turn on a Visualize Box')
```

```
Image Process
```

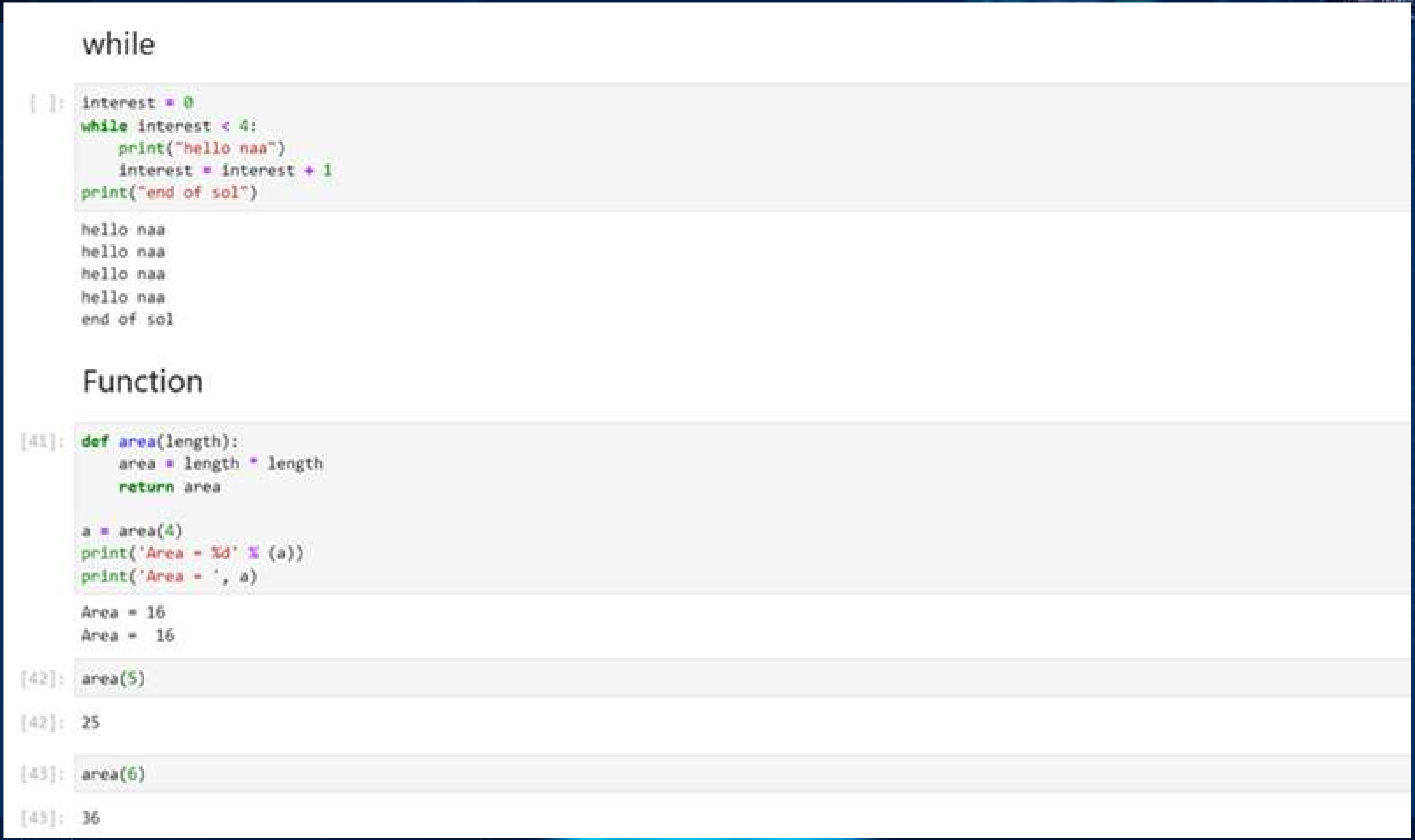
Iteration (Loop):

```
[35]: for count in range(4,6):
          print("number = ",end="")
          print(count)
      print()
      print("done")

      #print
      print('data = ',a)
```

```
number = 4
number = 5

done
data =  3
```

Jupyter Notebook

image processing



while

```
[ ]: interest = 0
     while interest < 4:
         print("hello naa")
         interest = interest + 1
     print("end of sol")
```

```
hello naa
hello naa
hello naa
hello naa
end of sol
```

Function

```
[41]: def area(length):
          area = length * length
          return area

      a = area(4)
      print('Area = %d' % (a))
      print('Area = ', a)
```

```
Area = 16
Area =  16
```

```
[42]: area(5)
```

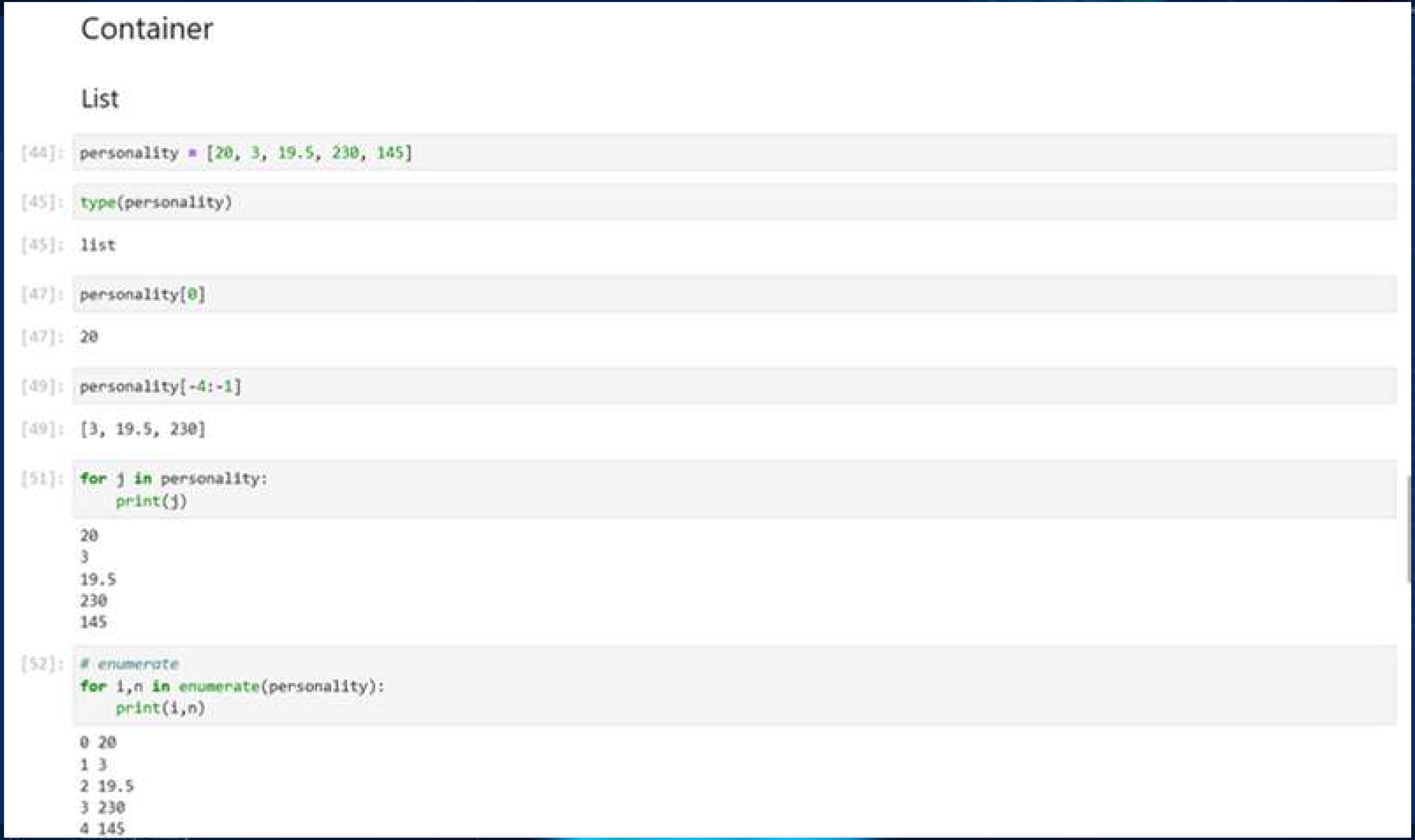
```
[42]: 25
```

```
[43]: area(6)
```

```
[43]: 36
```

Jupyter Notebook

image processing



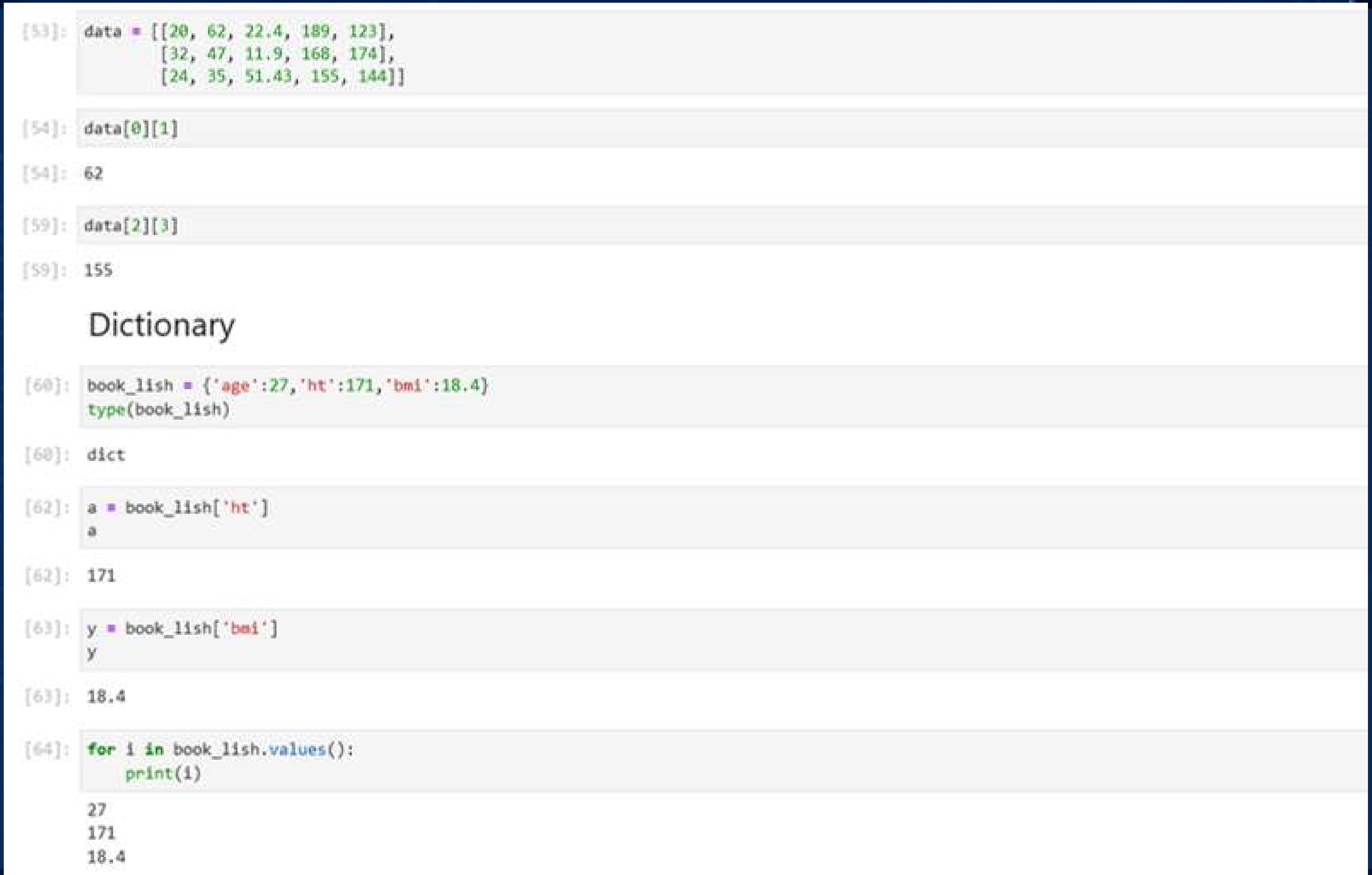
Container

List

```
[44]: personality = [20, 3, 19.5, 230, 145]

[45]: type(personality)

[45]: list

[47]: personality[0]

[47]: 20

[49]: personality[-4:-1]

[49]: [3, 19.5, 230]

[51]: for j in personality:
          print(j)

      20
      3
      19.5
      230
      145

[52]: # enumerate
      for i,n in enumerate(personality):
          print(i,n)

      0 20
      1 3
      2 19.5
      3 230
      4 145
```

Jupyter Notebook

image processing



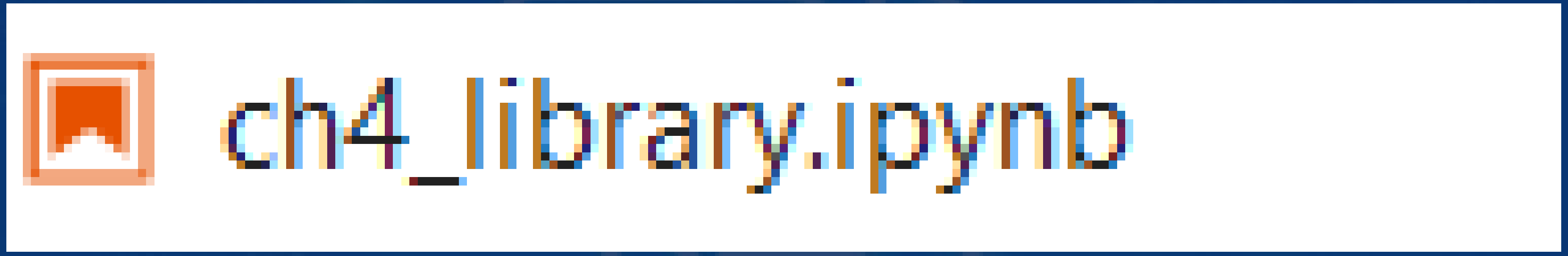
```
[53]: data = [[20, 62, 22.4, 189, 123],
              [32, 47, 11.9, 168, 174],
              [24, 35, 51.43, 155, 144]]

[54]: data[0][1]

[54]: 62

[59]: data[2][3]

[59]: 155
```

Dictionary

```
[60]: book_lish = {'age':27,'ht':171,'bmi':18.4}
      type(book_lish)

[60]: dict

[62]: a = book_lish['ht']
      a

[62]: 171

[63]: y = book_lish['bmi']
      y

[63]: 18.4

[64]: for i in book_lish.values():
          print(i)

      27
      171
      18.4
```

Jupyter Notebook

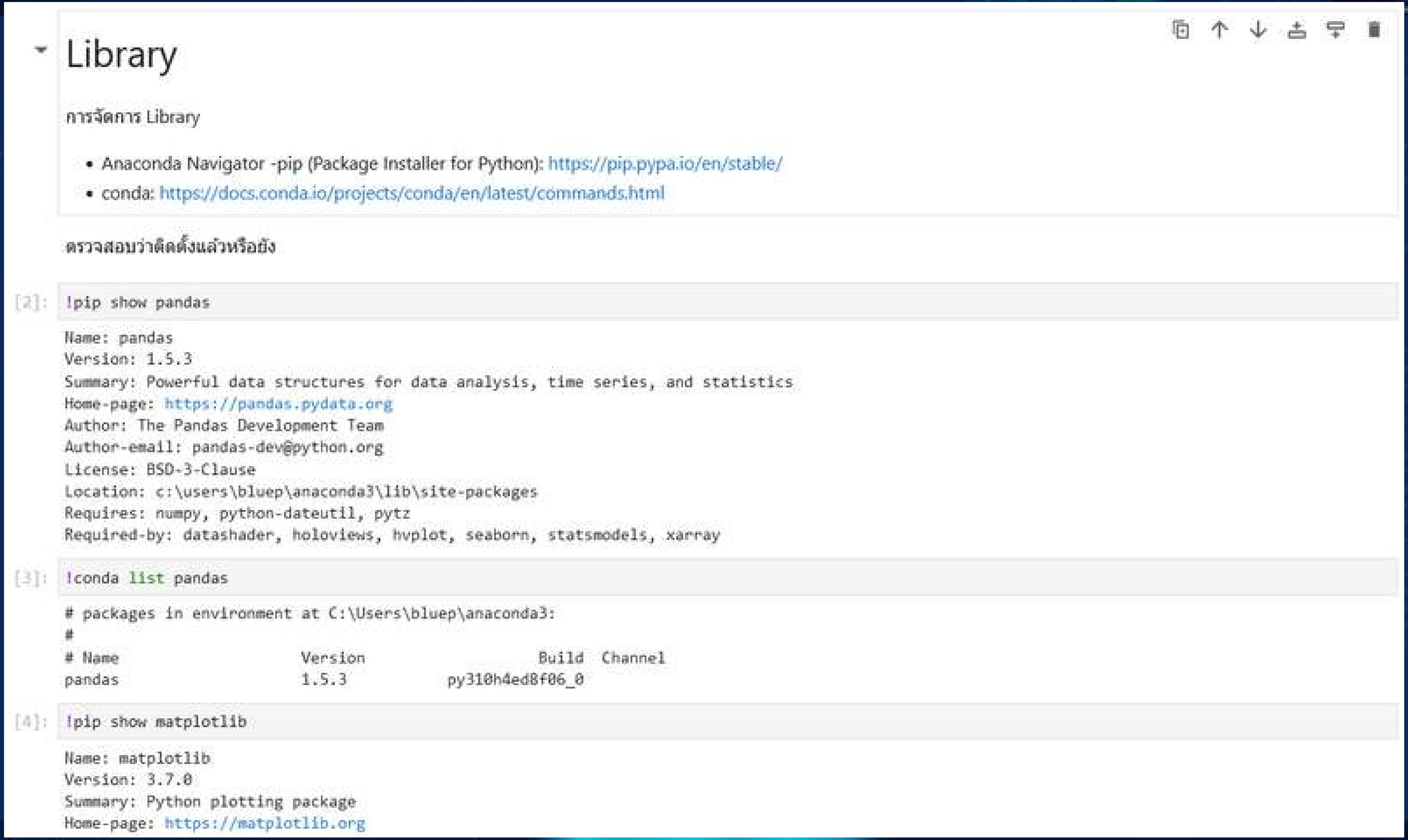
image processing



ch4_library.ipynb

Jupyter Notebook

image processing



Library

การจัดการ Library

- Anaconda Navigator -pip (Package Installer for Python): https://pip.pypa.io/en/stable/
- conda: https://docs.conda.io/projects/conda/en/latest/commands.html

ตรวจสอบว่าติดตั้งแล้วหรือยัง

[2]:
```
!pip show pandas
```

```
Name: pandas
Version: 1.5.3
Summary: Powerful data structures for data analysis, time series, and statistics
Home-page: https://pandas.pydata.org
Author: The Pandas Development Team
Author-email: pandas-dev@python.org
License: BSD-3-Clause
Location: c:\users\bluep\anaconda3\lib\site-packages
Requires: numpy, python-dateutil, pytz
Required-by: datashader, holoviews, hvplot, seaborn, statsmodels, xarray
```

[3]:
```
!conda list pandas
```

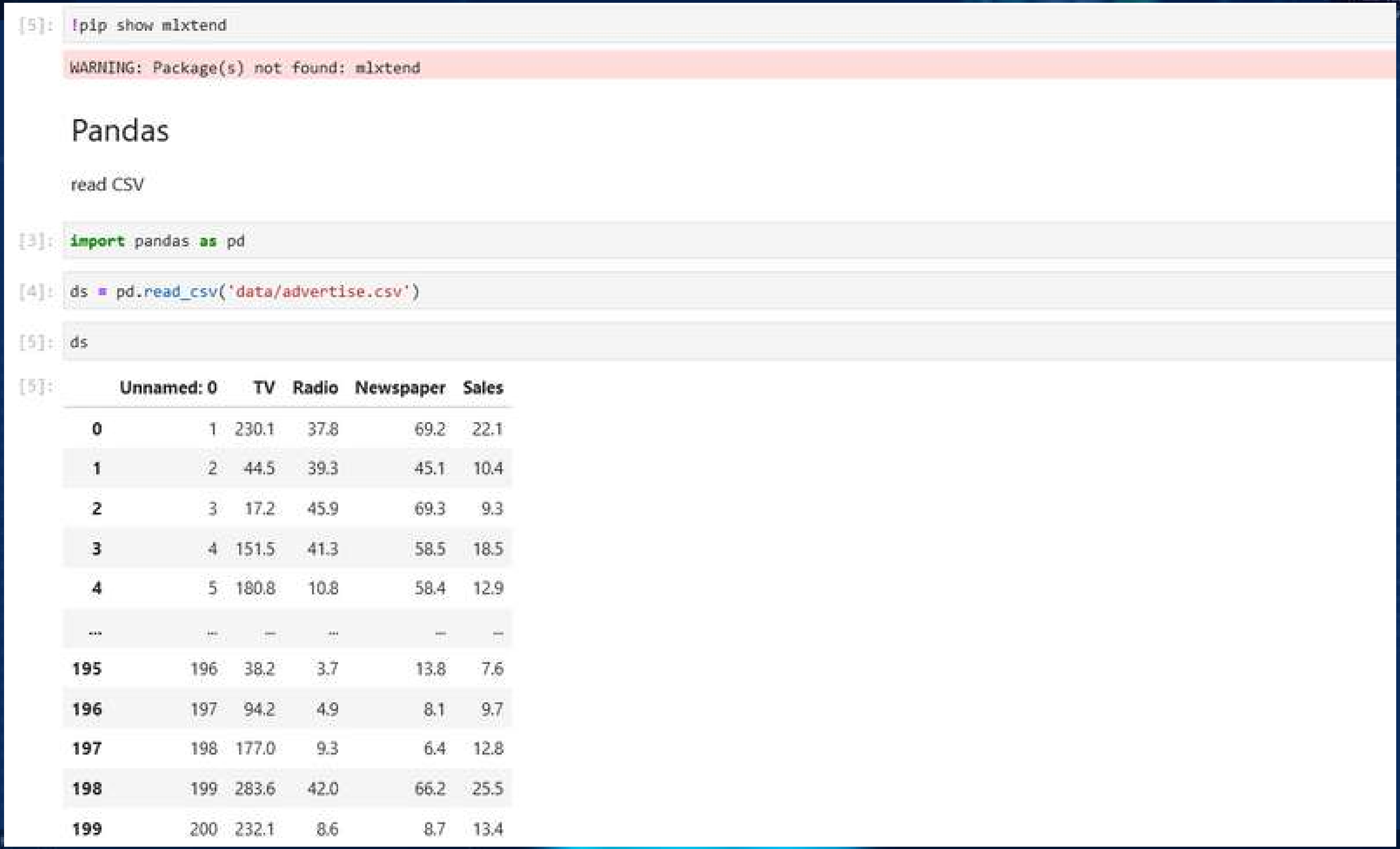
```
# packages in environment at C:\Users\bluep\anaconda3:
#
# Name                    Version                   Build  Channel
pandas                    1.5.3           py310h4ed8f06_0
```

[4]:
```
!pip show matplotlib
```

```
Name: matplotlib
Version: 3.7.0
Summary: Python plotting package
Home-page: https://matplotlib.org
```

Jupyter Notebook

image processing



```
[5]: !pip show mlxtend
```

```
WARNING: Package(s) not found: mlxtend
```

Pandas

read CSV

```
[3]: import pandas as pd
```

```
[4]: ds = pd.read_csv('data/advertise.csv')
```

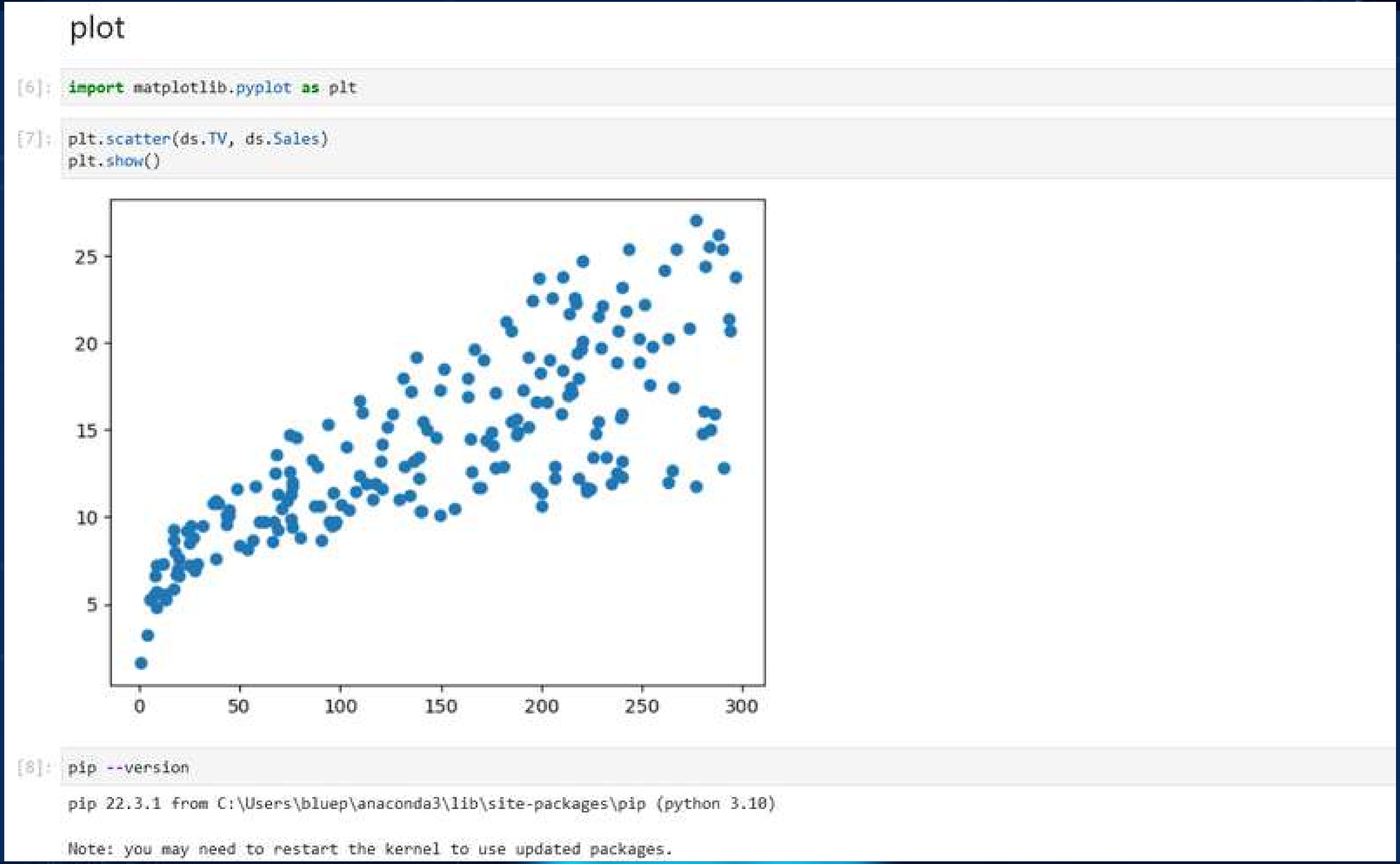
```
[5]: ds
```

[5]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
0	1	230.1	37.8	69.2	22.1
1	2	44.5	39.3	45.1	10.4
2	3	17.2	45.9	69.3	9.3
3	4	151.5	41.3	58.5	18.5
4	5	180.8	10.8	58.4	12.9
...	...	...	...	...	...
195	196	38.2	3.7	13.8	7.6
196	197	94.2	4.9	8.1	9.7
197	198	177.0	9.3	6.4	12.8
198	199	283.6	42.0	66.2	25.5
199	200	232.1	8.6	8.7	13.4

Jupyter Notebook

image processing



plot

```
[6]: import matplotlib.pyplot as plt
```

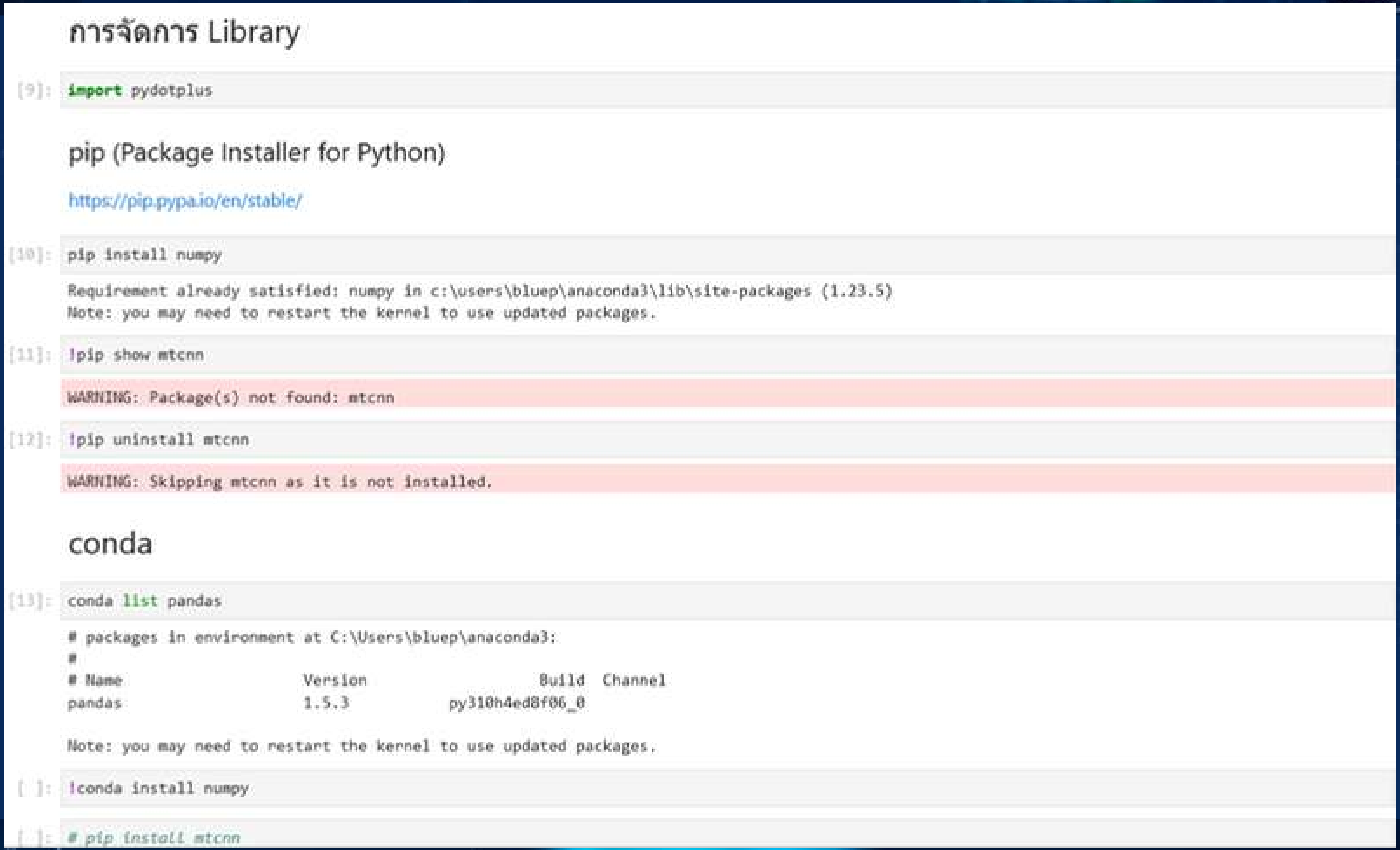
```
[7]: plt.scatter(ds.TV, ds.Sales)
     plt.show()
```

```
[8]: pip --version
```

```
pip 22.3.1 from C:\Users\bluep\anaconda3\lib\site-packages\pip (python 3.10)

Note: you may need to restart the kernel to use updated packages.
```

Jupyter Notebook

image processing



การจัดการ Library

```
[9]: import pydotplus
```

pip (Package Installer for Python)

https://pip.pypa.io/en/stable/

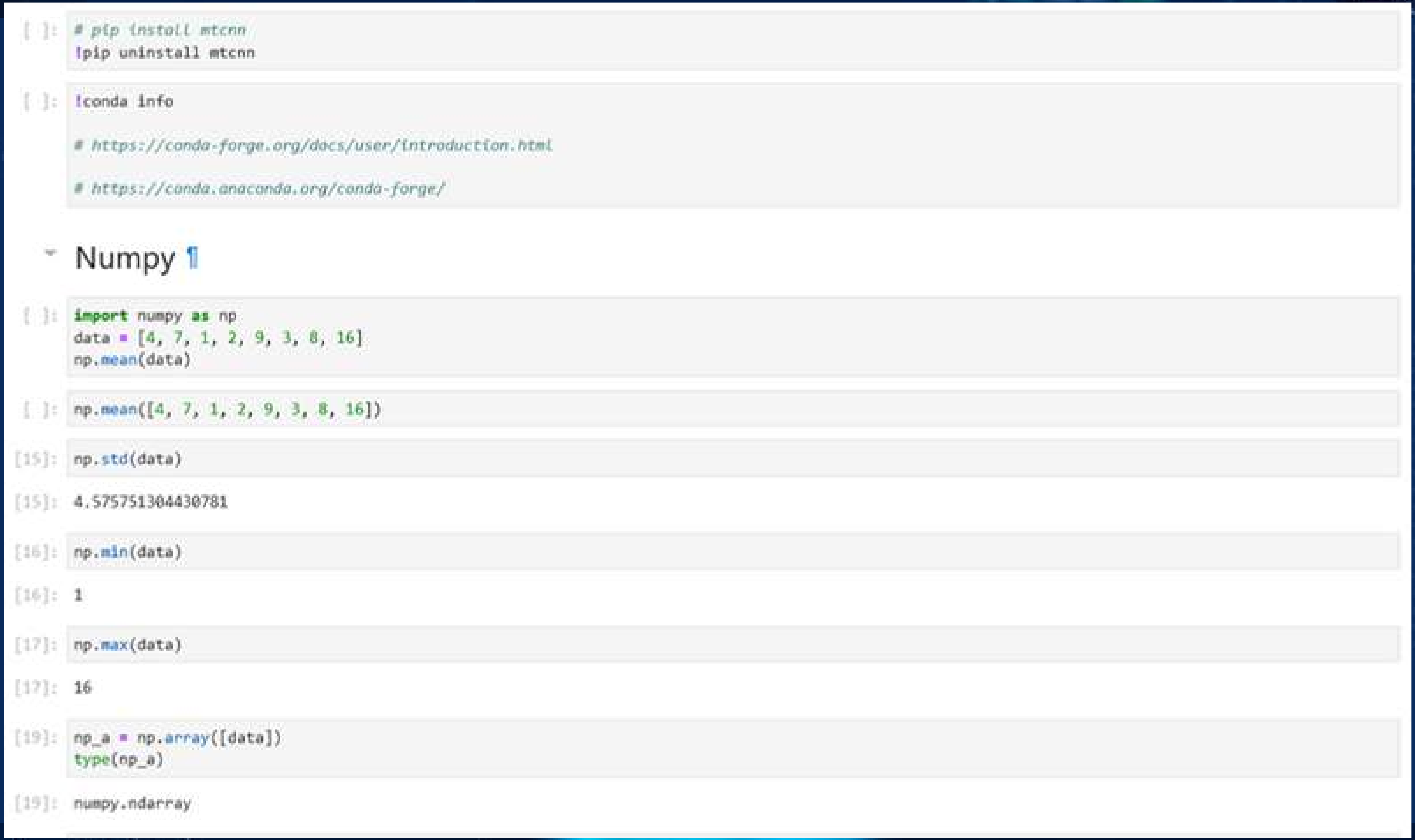
```
[10]: pip install numpy

Requirement already satisfied: numpy in c:\users\bluep\anaconda3\lib\site-packages (1.23.5)
Note: you may need to restart the kernel to use updated packages.

[11]: !pip show mtcnn

WARNING: Package(s) not found: mtcnn

[12]: !pip uninstall mtcnn

WARNING: Skipping mtcnn as it is not installed.
```

conda

```
[13]: conda list pandas

# packages in environment at C:\Users\bluep\anaconda3:
#
# Name                    Version                   Build  Channel
pandas                    1.5.3           py310h4ed8f06_0

Note: you may need to restart the kernel to use updated packages.

[ ]: !conda install numpy

[ ]: # pip install mtcnn
```

Jupyter Notebook

image processing



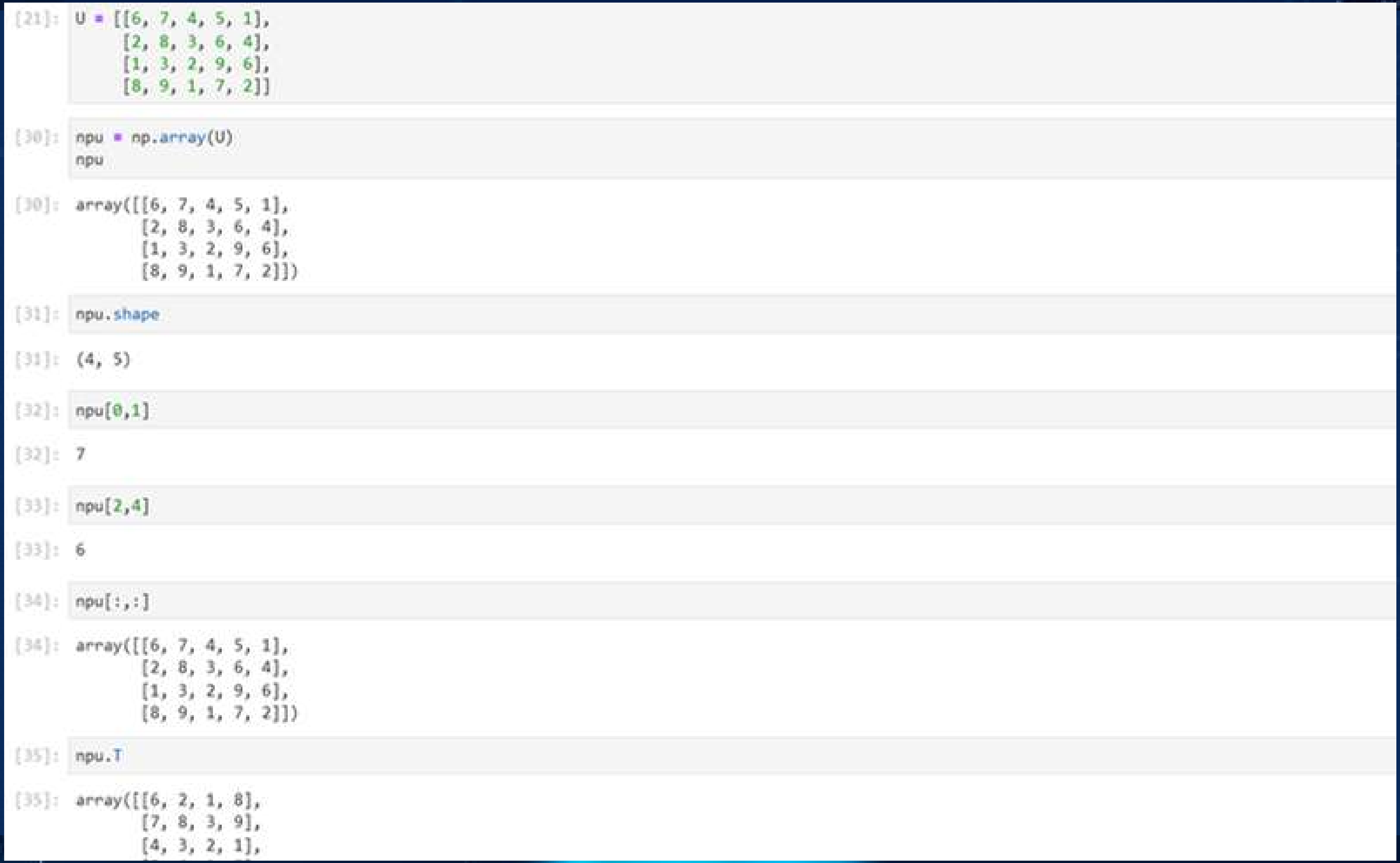
```
[ ]: # pip install mtcnn
     !pip uninstall mtcnn

[ ]: !conda info

     # https://conda-forge.org/docs/user/introduction.html

     # https://conda.anaconda.org/conda-forge/
```

Numpy ¶

```
[ ]: import numpy as np
     data = [4, 7, 1, 2, 9, 3, 8, 16]
     np.mean(data)

[ ]: np.mean([4, 7, 1, 2, 9, 3, 8, 16])

[15]: np.std(data)

[15]: 4.575751304430781

[16]: np.min(data)

[16]: 1

[17]: np.max(data)

[17]: 16

[19]: np_a = np.array([data])
      type(np_a)

[19]: numpy.ndarray
```

Jupyter Notebook

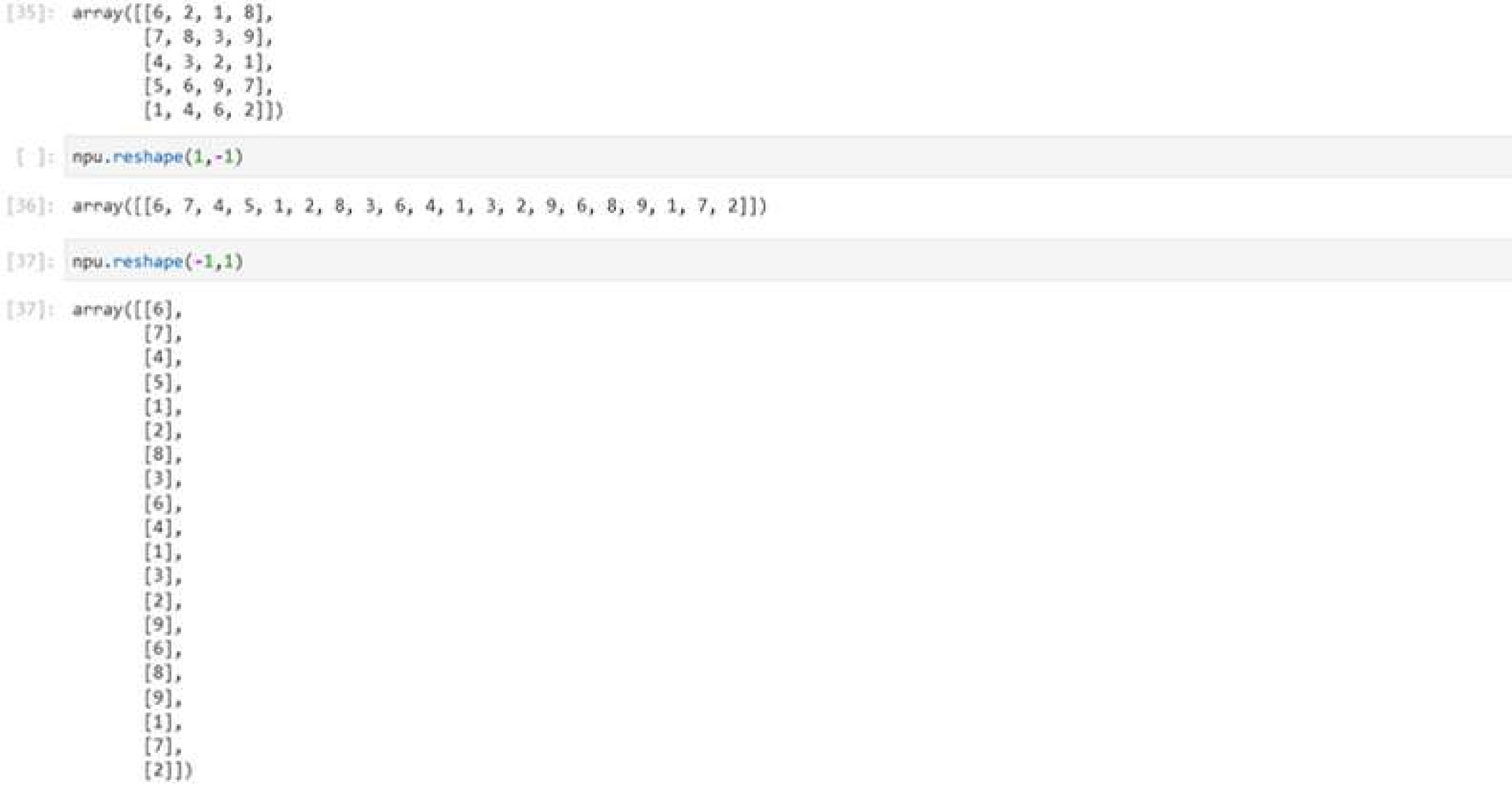
image processing



```
[21]: U = [[6, 7, 4, 5, 1],
          [2, 8, 3, 6, 4],
          [1, 3, 2, 9, 6],
          [8, 9, 1, 7, 2]]

[30]: npu = np.array(U)
      npu

[30]: array([[6, 7, 4, 5, 1],
             [2, 8, 3, 6, 4],
             [1, 3, 2, 9, 6],
             [8, 9, 1, 7, 2]])

[31]: npu.shape

[31]: (4, 5)

[32]: npu[0,1]

[32]: 7

[33]: npu[2,4]

[33]: 6

[34]: npu[:,:]

[34]: array([[6, 7, 4, 5, 1],
             [2, 8, 3, 6, 4],
             [1, 3, 2, 9, 6],
             [8, 9, 1, 7, 2]])

[35]: npu.T

[35]: array([[6, 2, 1, 8],
             [7, 8, 3, 9],
             [4, 3, 2, 1],
```

Jupyter Notebook

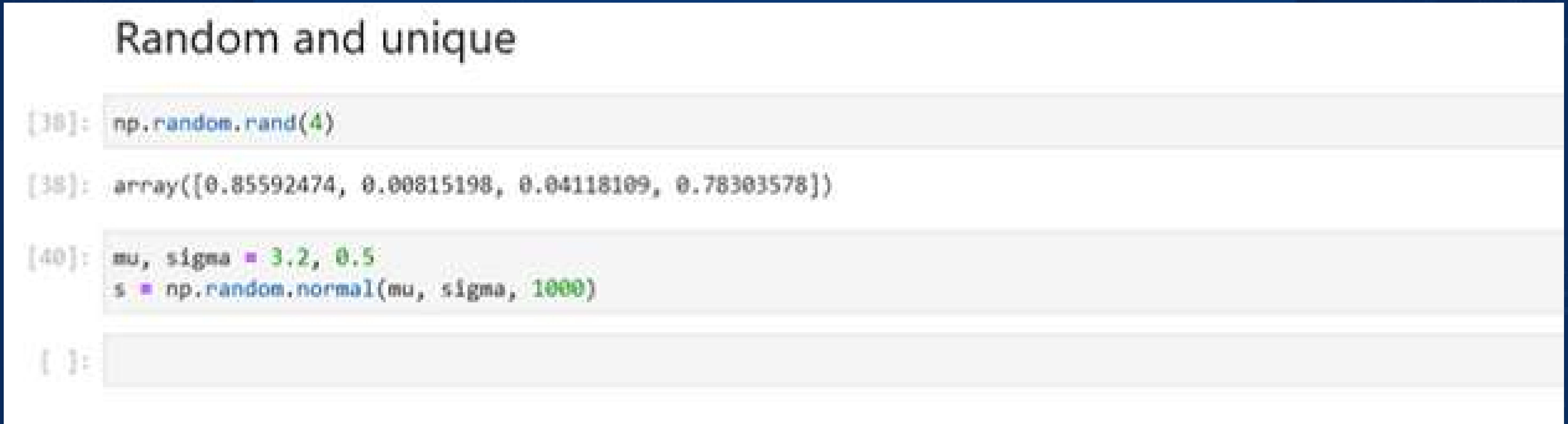
image processing



```
[35]: array([[6, 2, 1, 8],
             [7, 8, 3, 9],
             [4, 3, 2, 1],
             [5, 6, 9, 7],
             [1, 4, 6, 2]])

[ ]:  npu.reshape(1,-1)

[36]: array([[6, 7, 4, 5, 1, 2, 8, 3, 6, 4, 1, 3, 2, 9, 6, 8, 9, 1, 7, 2]])

[37]: npu.reshape(-1,1)

[37]: array([[6],
             [7],
             [4],
             [5],
             [1],
             [2],
             [8],
             [3],
             [6],
             [4],
             [1],
             [3],
             [2],
             [9],
             [6],
             [8],
             [9],
             [1],
             [7],
             [2]])
```

Jupyter Notebook

image processing



Random and unique

```
[38]: np.random.rand(4)

[38]: array([0.85592474, 0.00815198, 0.04118109, 0.78303578])

[40]: mu, sigma = 3.2, 0.5
      s = np.random.normal(mu, sigma, 1000)

[ ]:
```

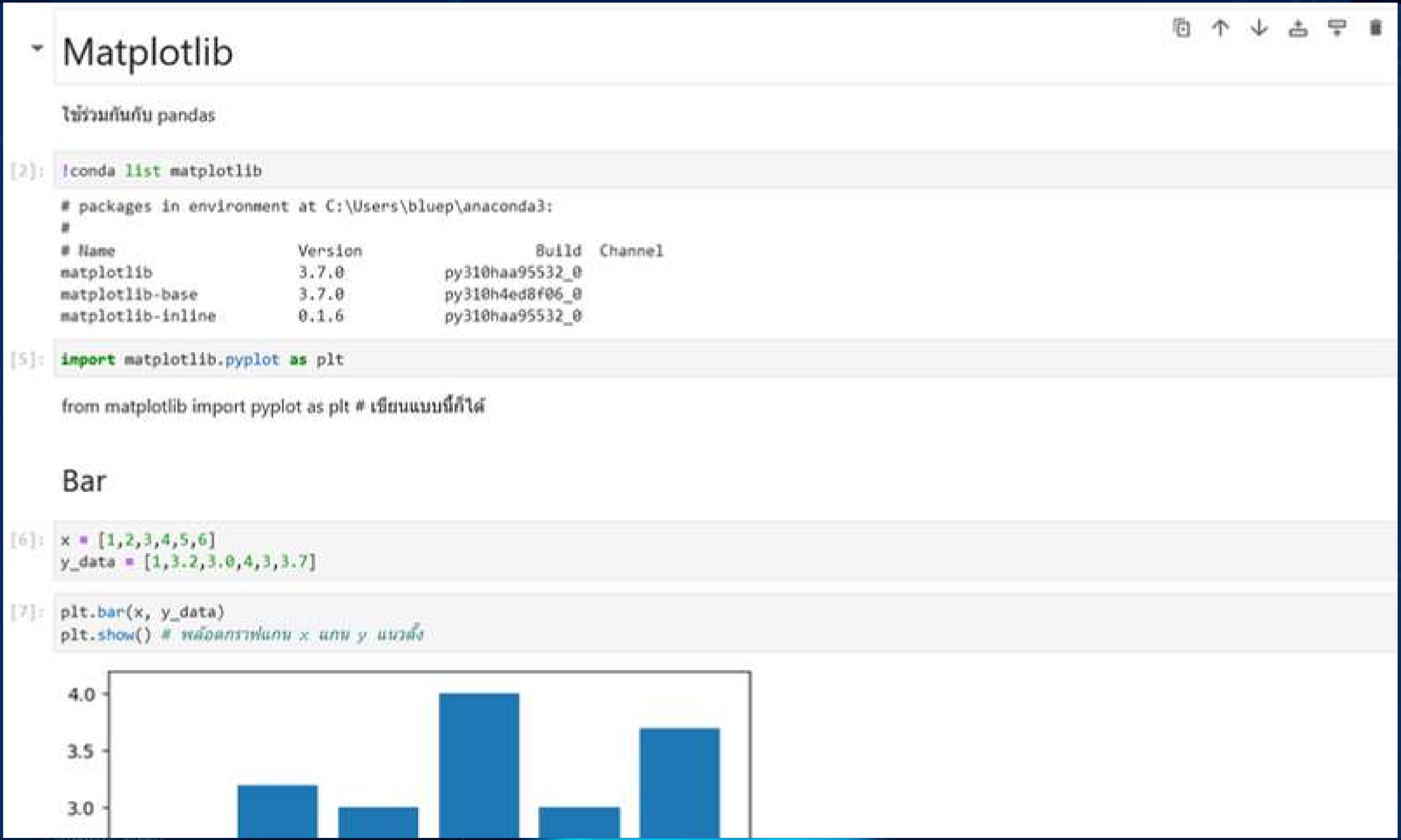
Jupyter Notebook

image processing

ch5_matplotlib.ipynb

Jupyter Notebook

image processing



Matplotlib

ใช้ร่วมกันกับ pandas

```
[2]: !conda list matplotlib
```

```
# packages in environment at C:\Users\bluep\anaconda3:
#
# Name                    Version                   Build  Channel
matplotlib                3.7.0           py310haa95532_0
matplotlib-base           3.7.0           py310h4ed8f06_0
matplotlib-inline         0.1.6           py310haa95532_0
```

```
[5]: import matplotlib.pyplot as plt
```

from matplotlib import pyplot as plt # เขียนแบบนี้ก็ได้

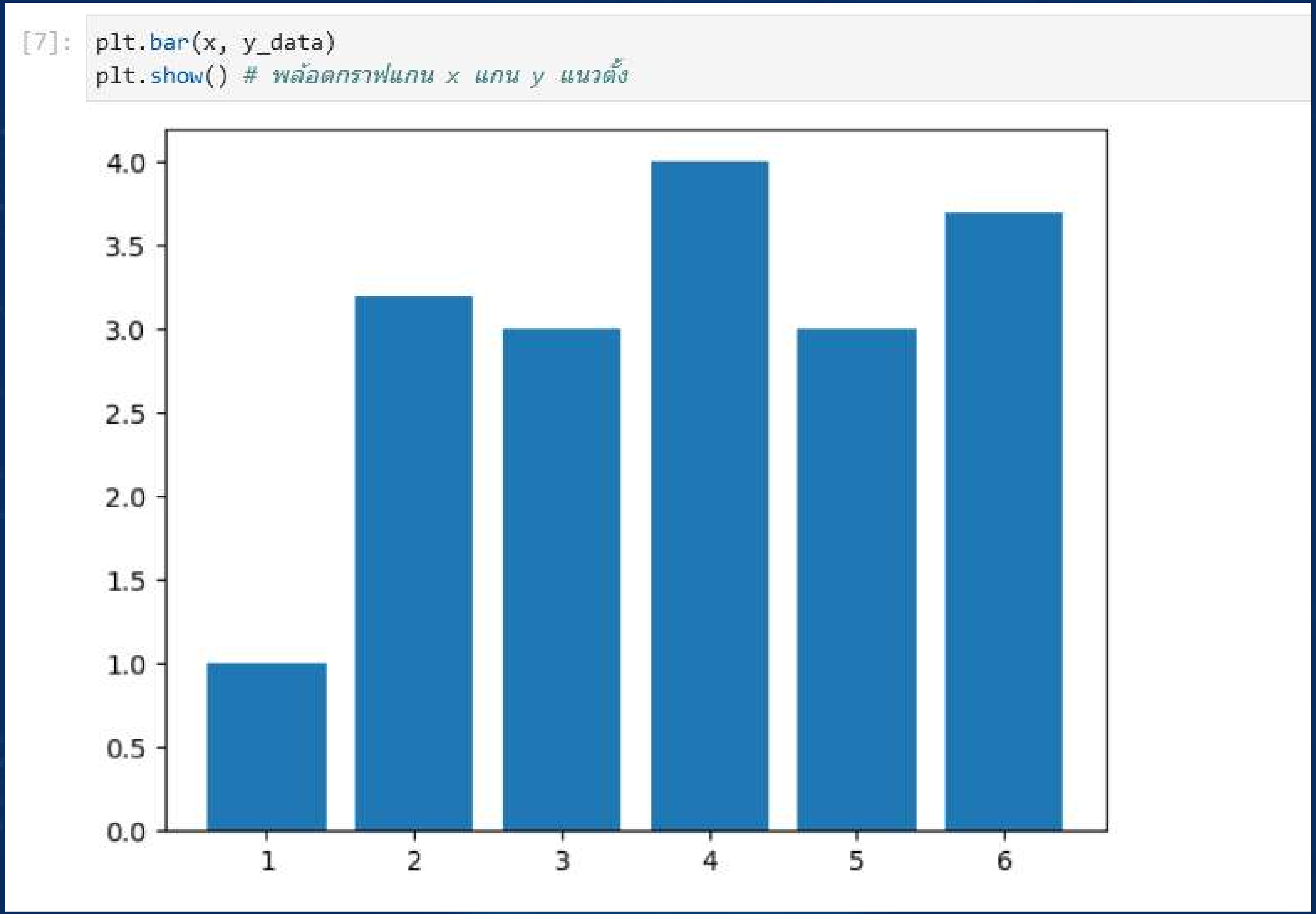
Bar

```
[6]: x = [1,2,3,4,5,6]
     y_data = [1,3.2,3.0,4,3,3.7]
```

```
[7]: plt.bar(x, y_data)
     plt.show() # พล็อตกราฟแกน x แกน y แนวตั้ง
```

Jupyter Notebook

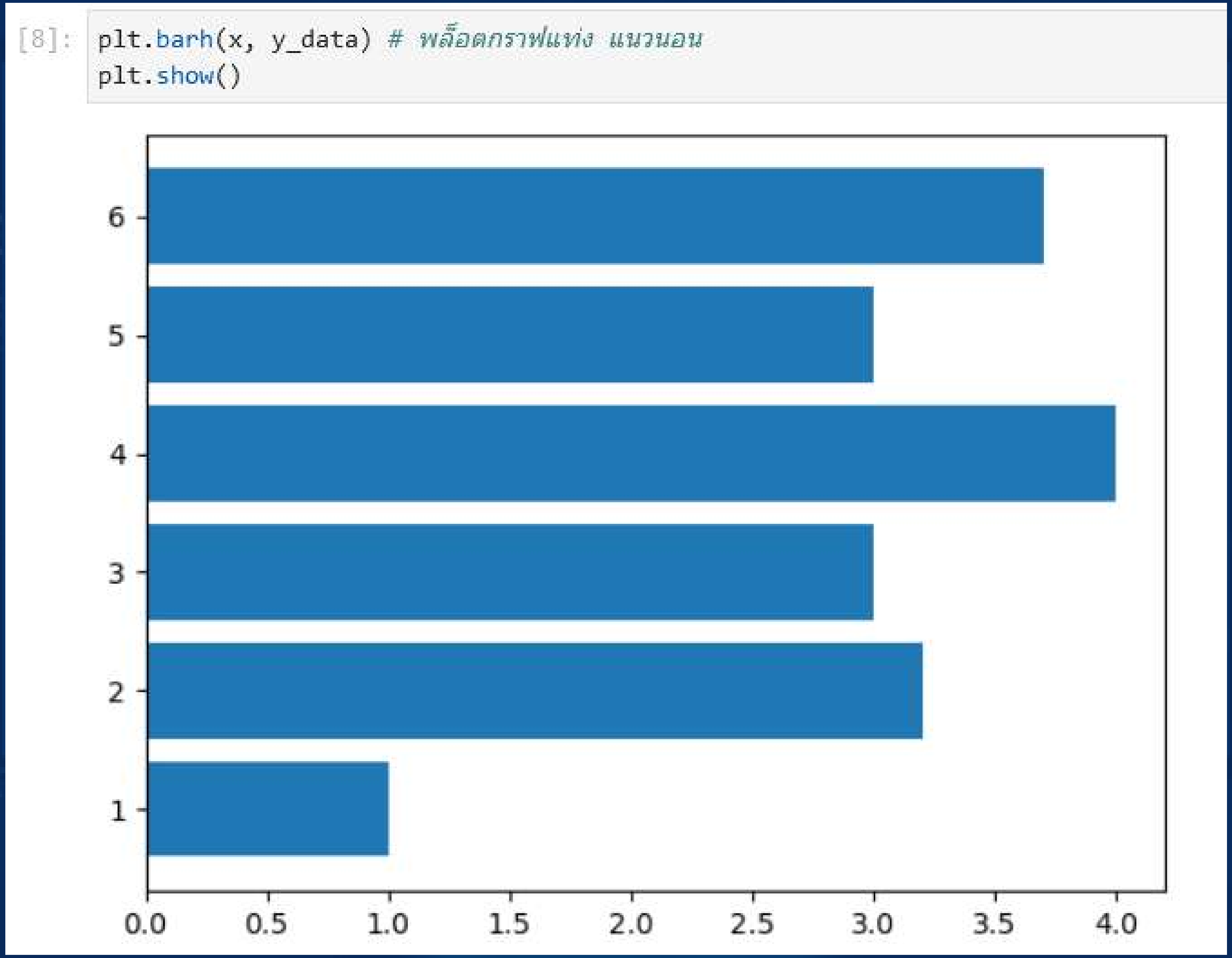
image processing



```
[7]: plt.bar(x, y_data)
     plt.show() # พล้อตกราฟแกน x แกน y แนวตั้ง
```

Jupyter Notebook

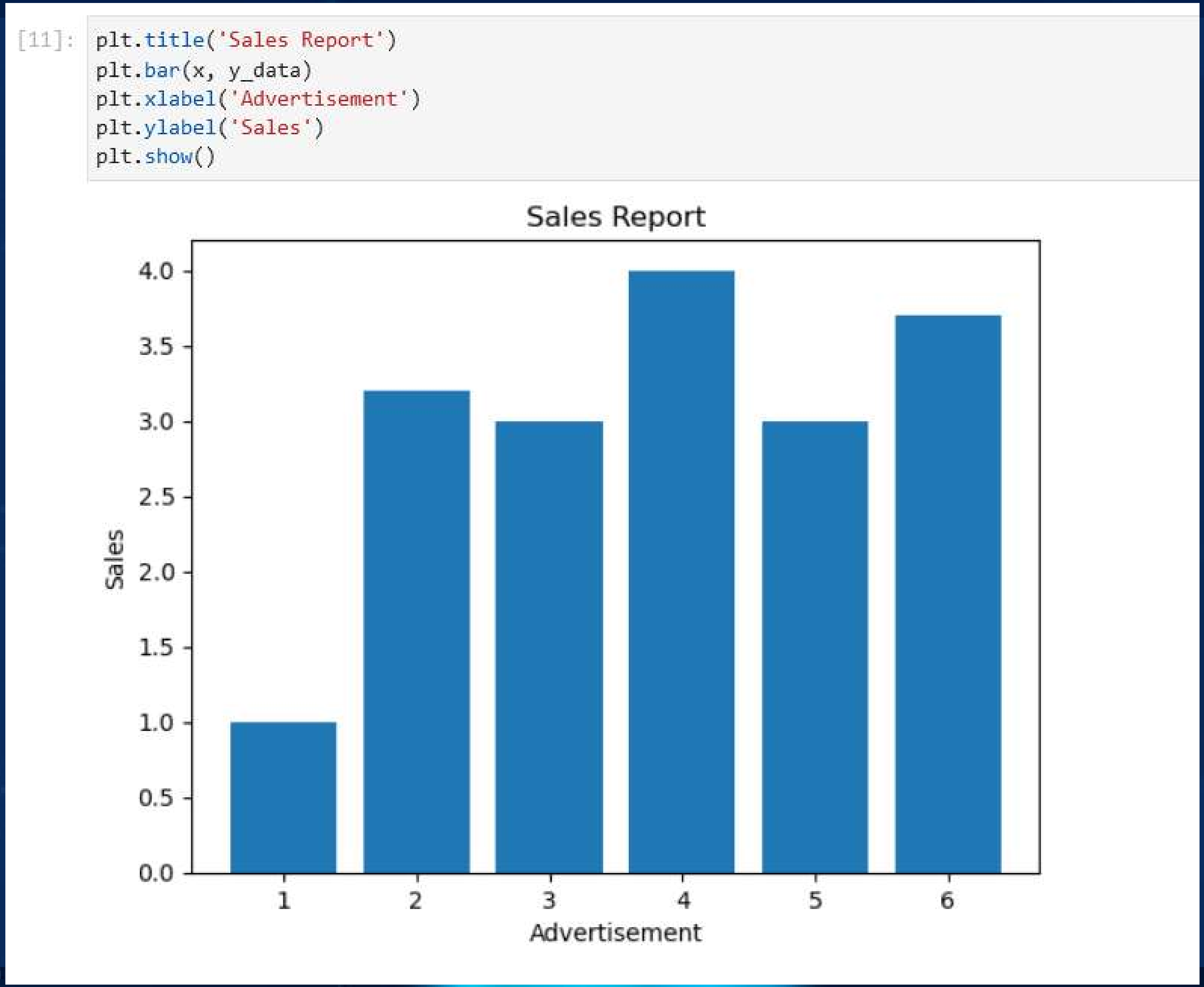
image processing



```
[8]: plt.barh(x, y_data) # พล็อตกราฟแท่ง แนวนอน
     plt.show()
```

Jupyter Notebook

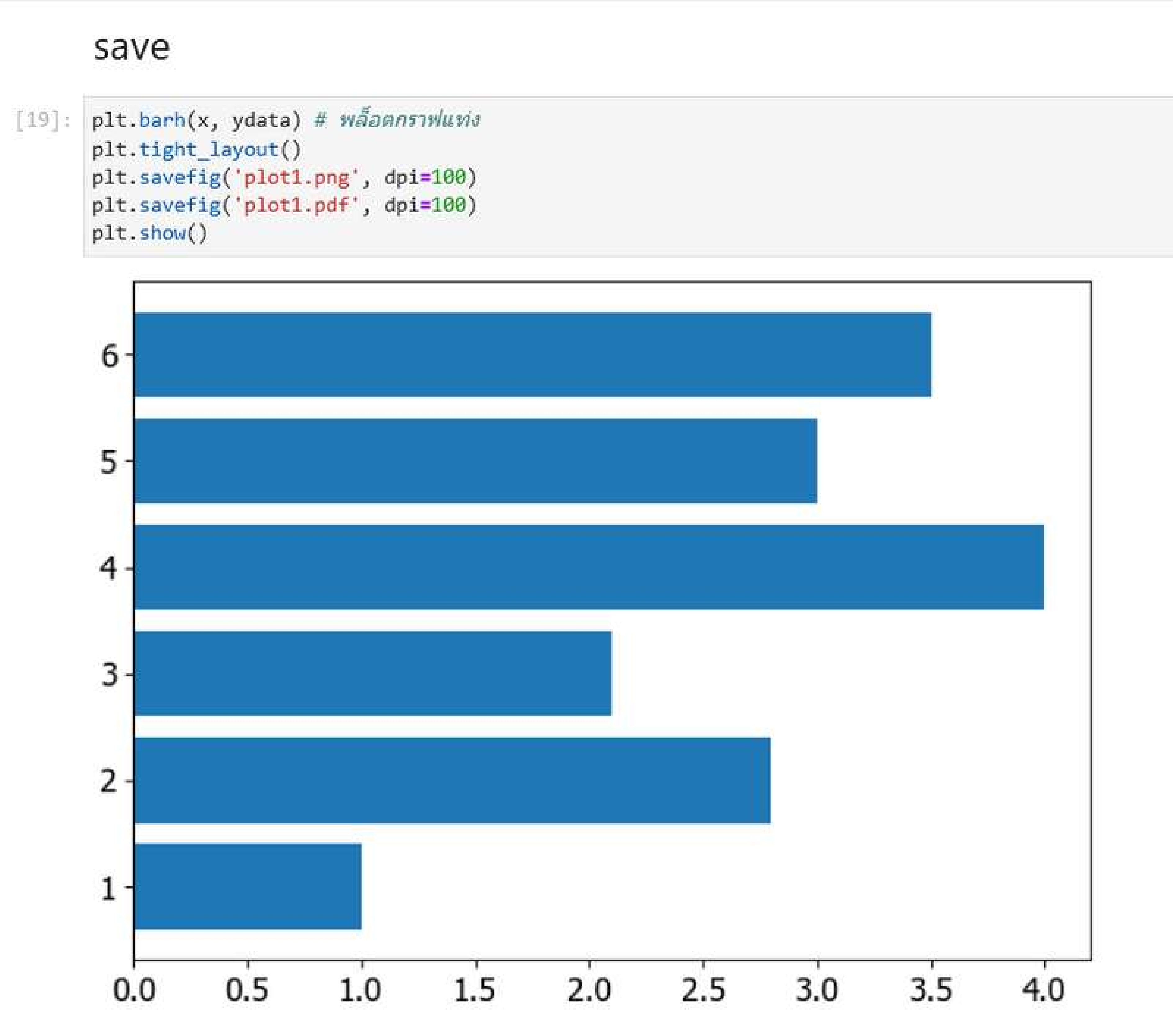
image processing



```
[11]: plt.title('Sales Report')
      plt.bar(x, y_data)
      plt.xlabel('Advertisement')
      plt.ylabel('Sales')
      plt.show()
```

Jupyter Notebook

image processing



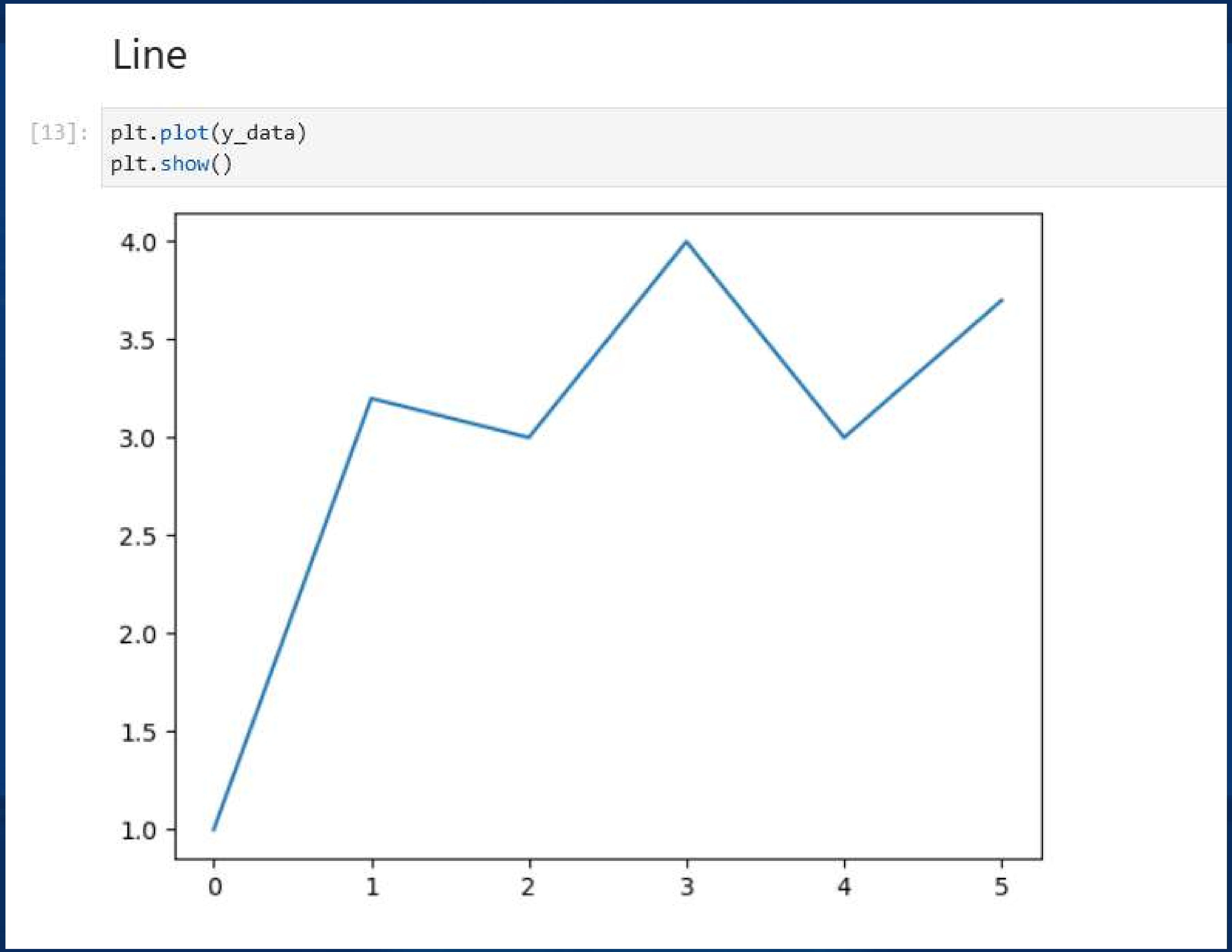
save

[19]:

```
plt.barh(x, ydata) # พล็อตกราฟแท่ง
plt.tight_layout()
plt.savefig('plot1.png', dpi=100)
plt.savefig('plot1.pdf', dpi=100)
plt.show()
```

Jupyter Notebook

image processing



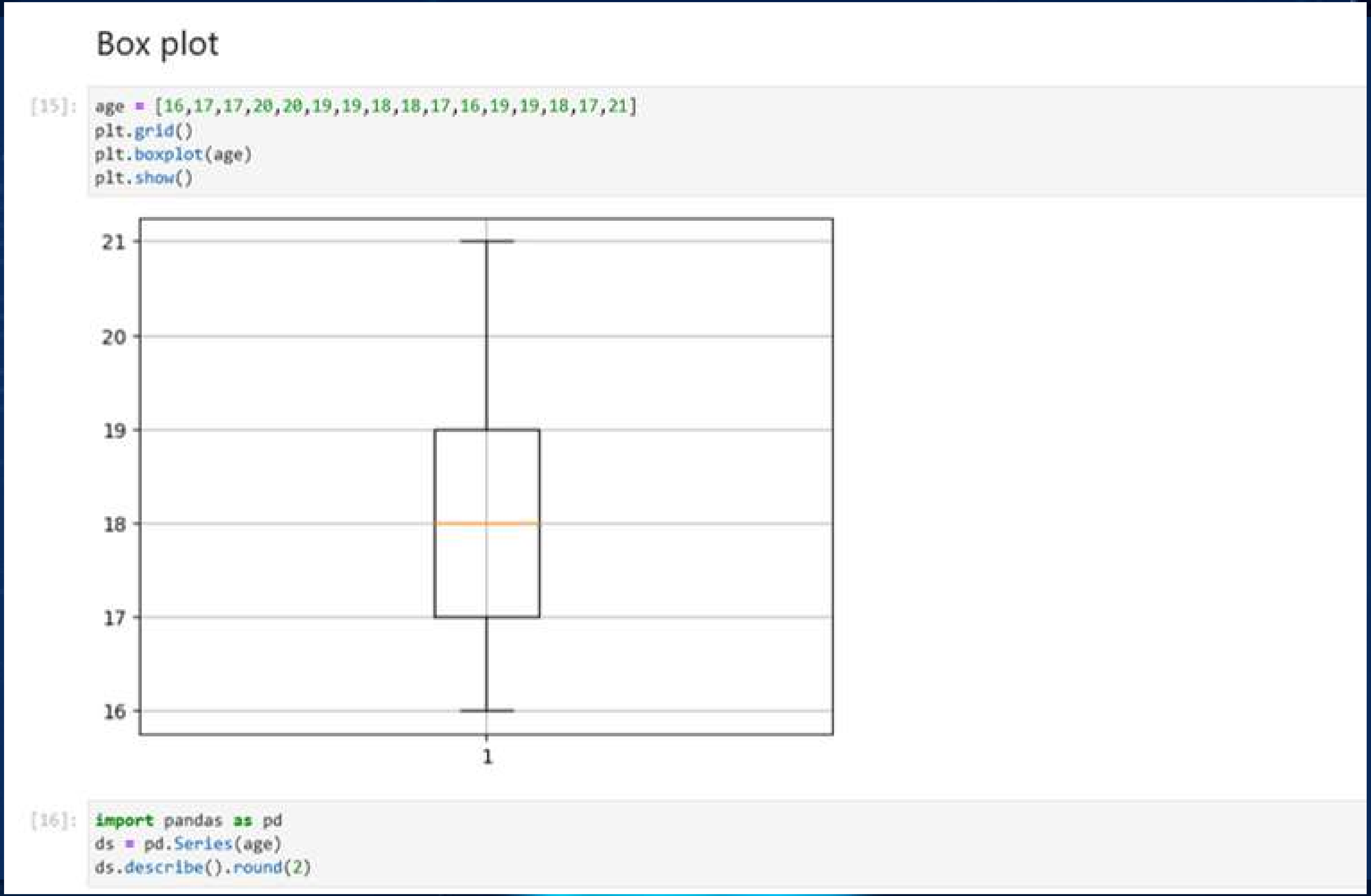
Line

[13]:

```
plt.plot(y_data)
plt.show()
```

Jupyter Notebook

image processing



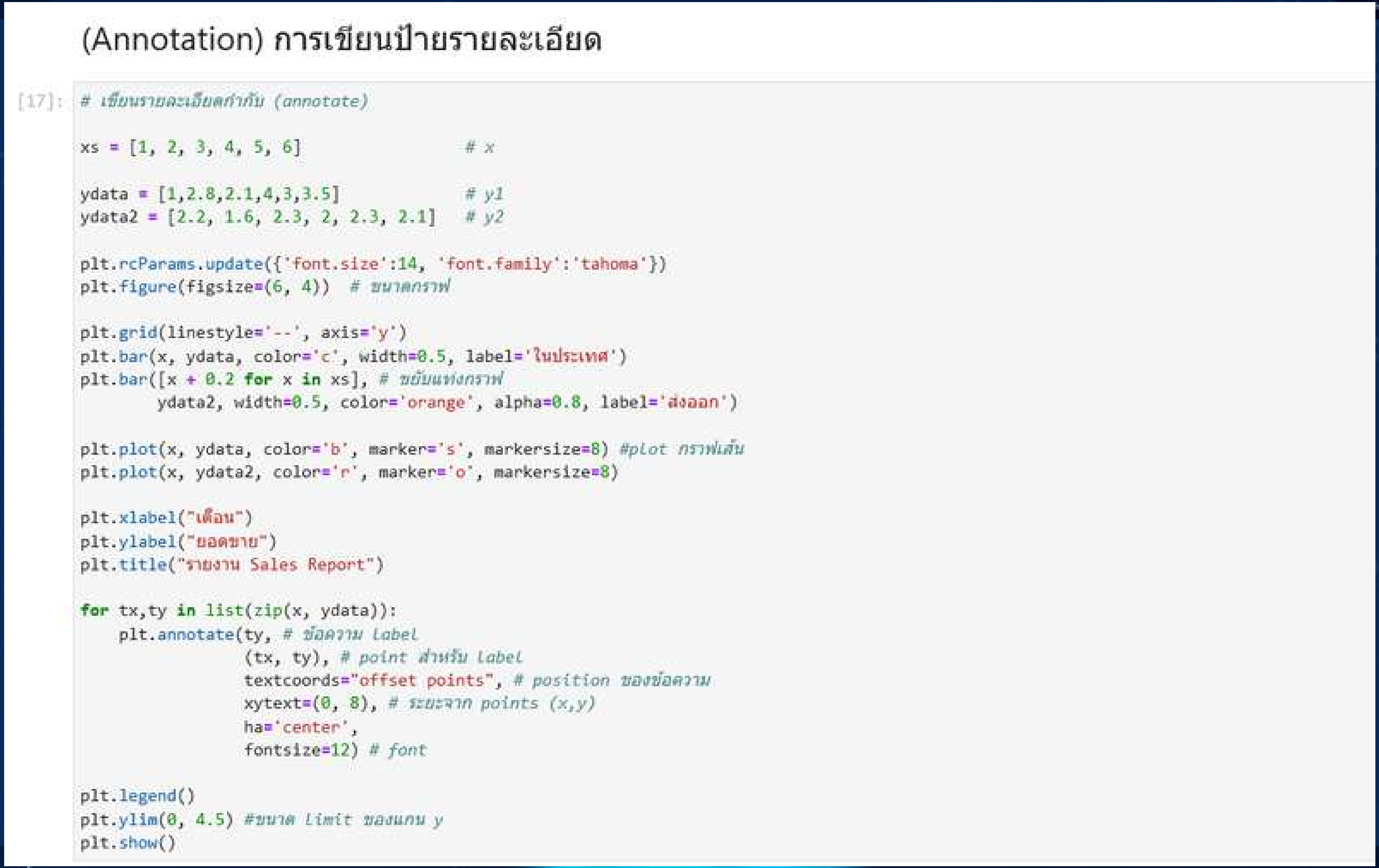
Box plot

```
[15]: age = [16,17,17,20,20,19,19,18,18,17,16,19,19,18,17,21]
      plt.grid()
      plt.boxplot(age)
      plt.show()
```

```
[16]: import pandas as pd
      ds = pd.Series(age)
      ds.describe().round(2)
```

Jupyter Notebook

image processing

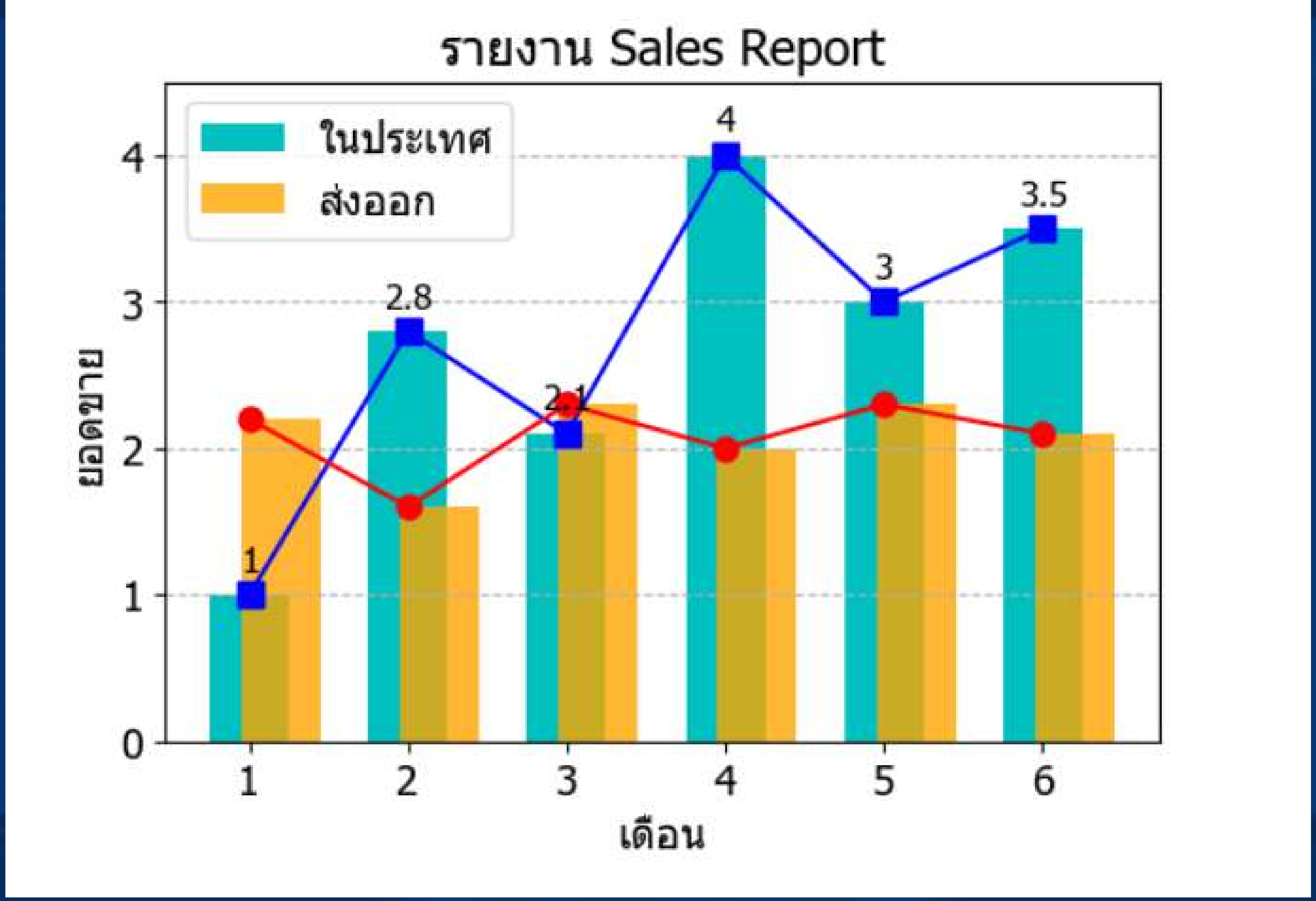


(Annotation) การเขียนป้ายรายละเอียด

```
[17]: # เขียนรายละเอียดกำกับ (annotate)

xs = [1, 2, 3, 4, 5, 6]                 # x

ydata = [1,2.8,2.1,4,3,3.5]             # y1
ydata2 = [2.2, 1.6, 2.3, 2, 2.3, 2.1]   # y2

plt.rcParams.update({'font.size':14, 'font.family':'tahoma'})
plt.figure(figsize=(6, 4))  # ขนาดกราฟ

plt.grid(linestyle='--', axis='y')
plt.bar(x, ydata, color='c', width=0.5, label='ในประเทศ')
plt.bar([x + 0.2 for x in xs], # ขยับแท่งกราฟ
        ydata2, width=0.5, color='orange', alpha=0.8, label='ส่งออก')

plt.plot(x, ydata, color='b', marker='s', markersize=8) #plot กราฟเส้น
plt.plot(x, ydata2, color='r', marker='o', markersize=8)

plt.xlabel("เดือน")
plt.ylabel("ยอดขาย")
plt.title("รายงาน Sales Report")

for tx,ty in list(zip(x, ydata)):
    plt.annotate(ty, # ข้อความ label
                 (tx, ty), # point สำหรับ label
                 textcoords="offset points", # position ของข้อความ
                 xytext=(0, 8), # ระยะจาก points (x,y)
                 ha='center',
                 fontsize=12) # font

plt.legend()
plt.ylim(0, 4.5) #ขนาด limit ของแกน y
plt.show()
```

Jupyter Notebook

image processing



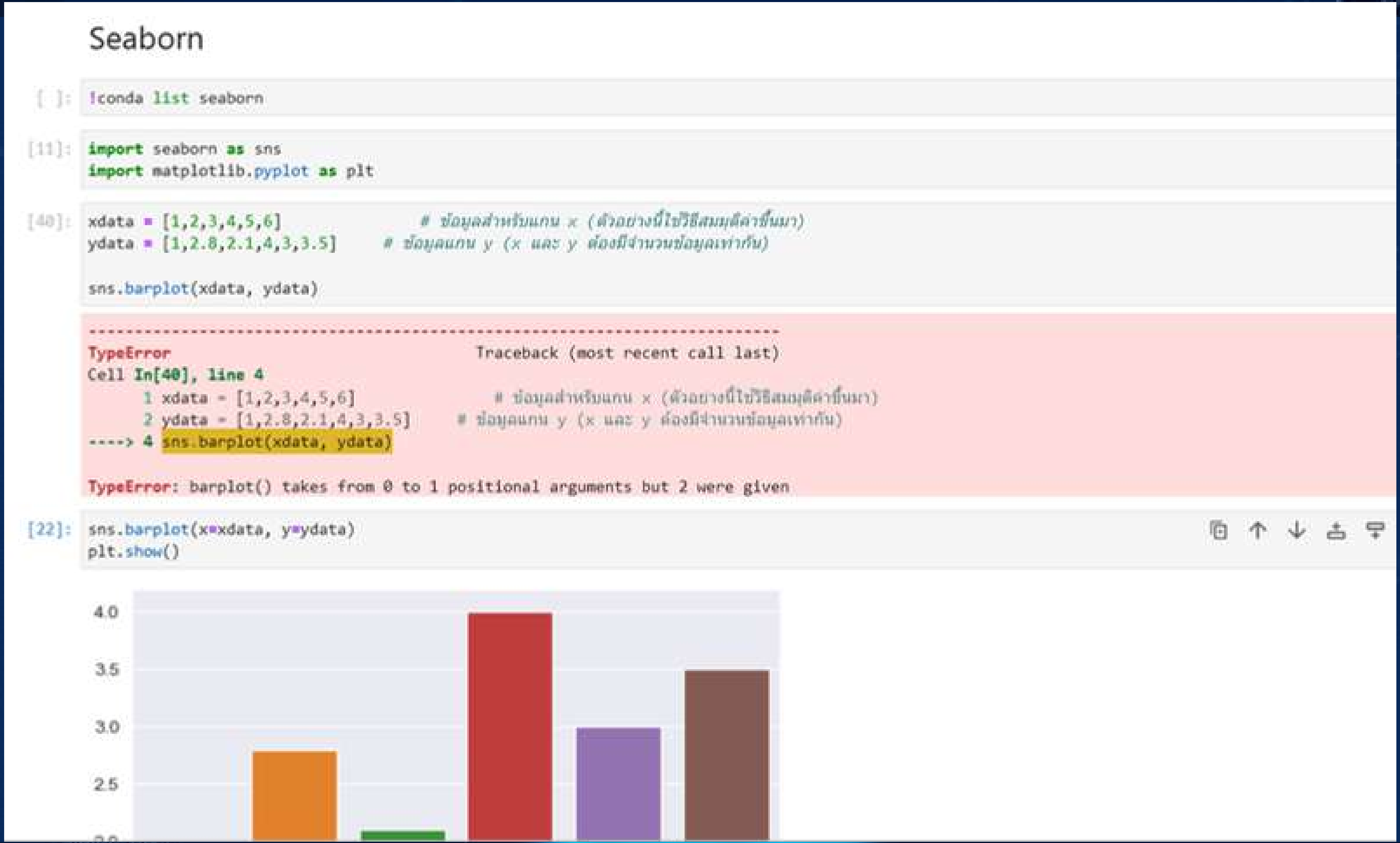
Jupyter Notebook

image processing

ch6 seaborn.ipynb

Jupyter Notebook

image processing



Seaborn

```
[ ]: !conda list seaborn
```

```
[11]: import seaborn as sns
      import matplotlib.pyplot as plt
```

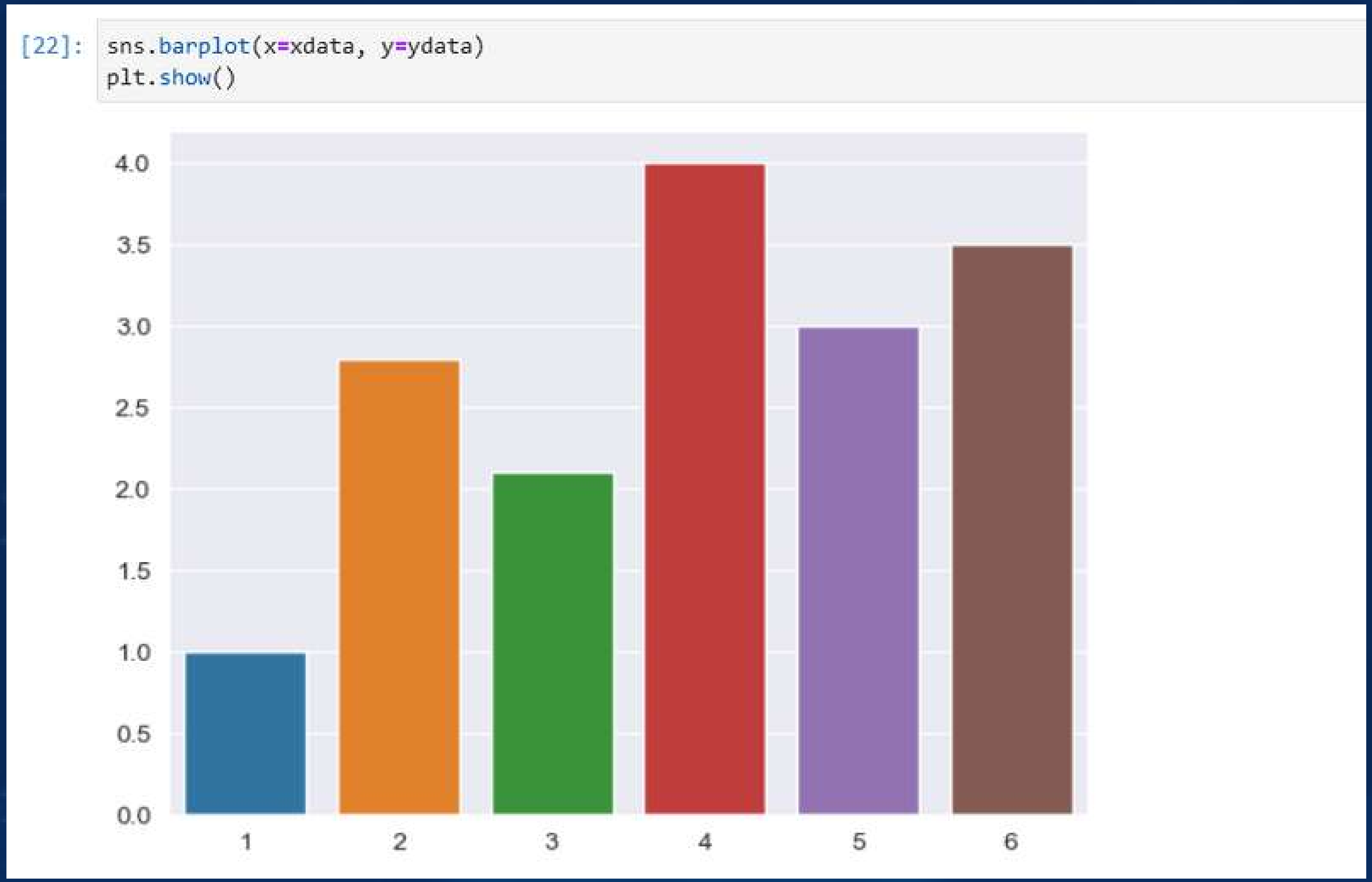
```
[40]: xdata = [1,2,3,4,5,6]              # ข้อมูลสำหรับแกน x (ตัวอย่างนี้ใช้วิธีสมมุติค่าขึ้นมา)
      ydata = [1,2.8,2.1,4,3,3.5]      # ข้อมูลแกน y (x และ y ต้องมีจำนวนข้อมูลเท่ากัน)

      sns.barplot(xdata, ydata)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[40], line 4
      1 xdata = [1,2,3,4,5,6]              # ข้อมูลสำหรับแกน x (ตัวอย่างนี้ใช้วิธีสมมุติค่าขึ้นมา)
      2 ydata = [1,2.8,2.1,4,3,3.5]      # ข้อมูลแกน y (x และ y ต้องมีจำนวนข้อมูลเท่ากัน)
----> 4 sns.barplot(xdata, ydata)

TypeError: barplot() takes from 0 to 1 positional arguments but 2 were given
```

```
[22]: sns.barplot(x=xdata, y=ydata)
      plt.show()
```

Jupyter Notebook

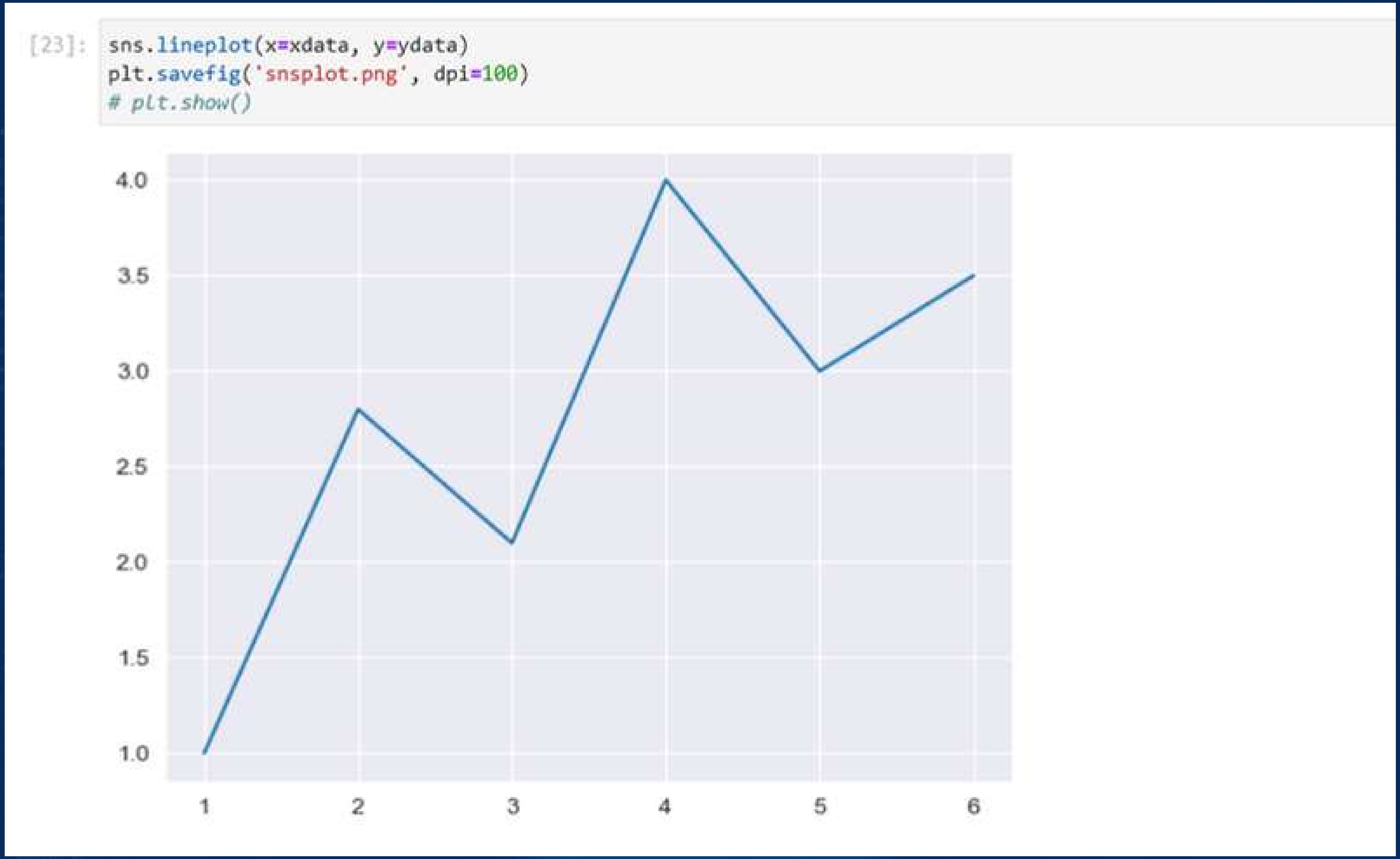
image processing



```
[22]: sns.barplot(x=xdata, y=ydata)
      plt.show()
```

Jupyter Notebook

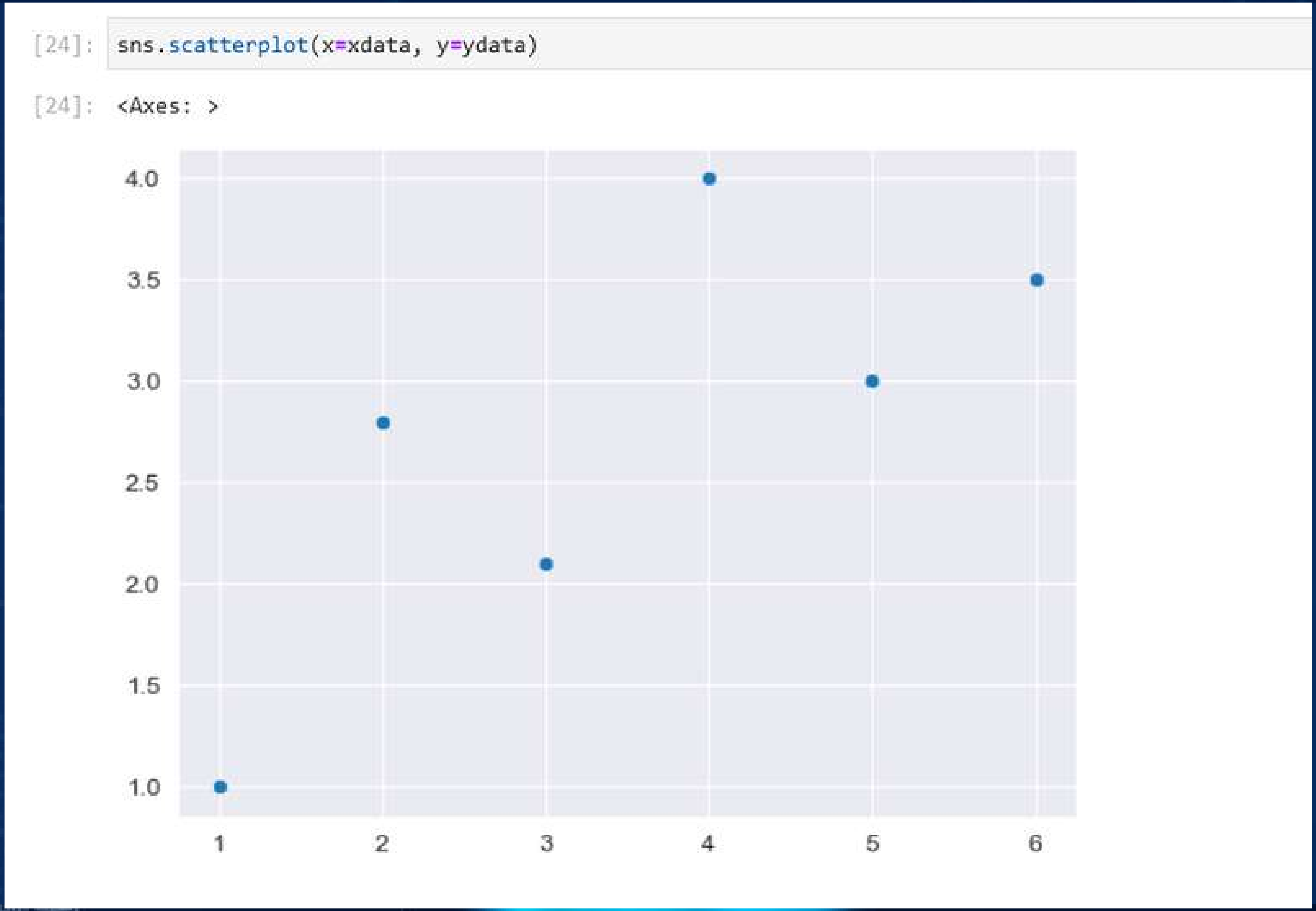
image processing



```
[23]: sns.lineplot(x=xdata, y=ydata)
      plt.savefig('snsplot.png', dpi=100)
      # plt.show()
```

Jupyter Notebook

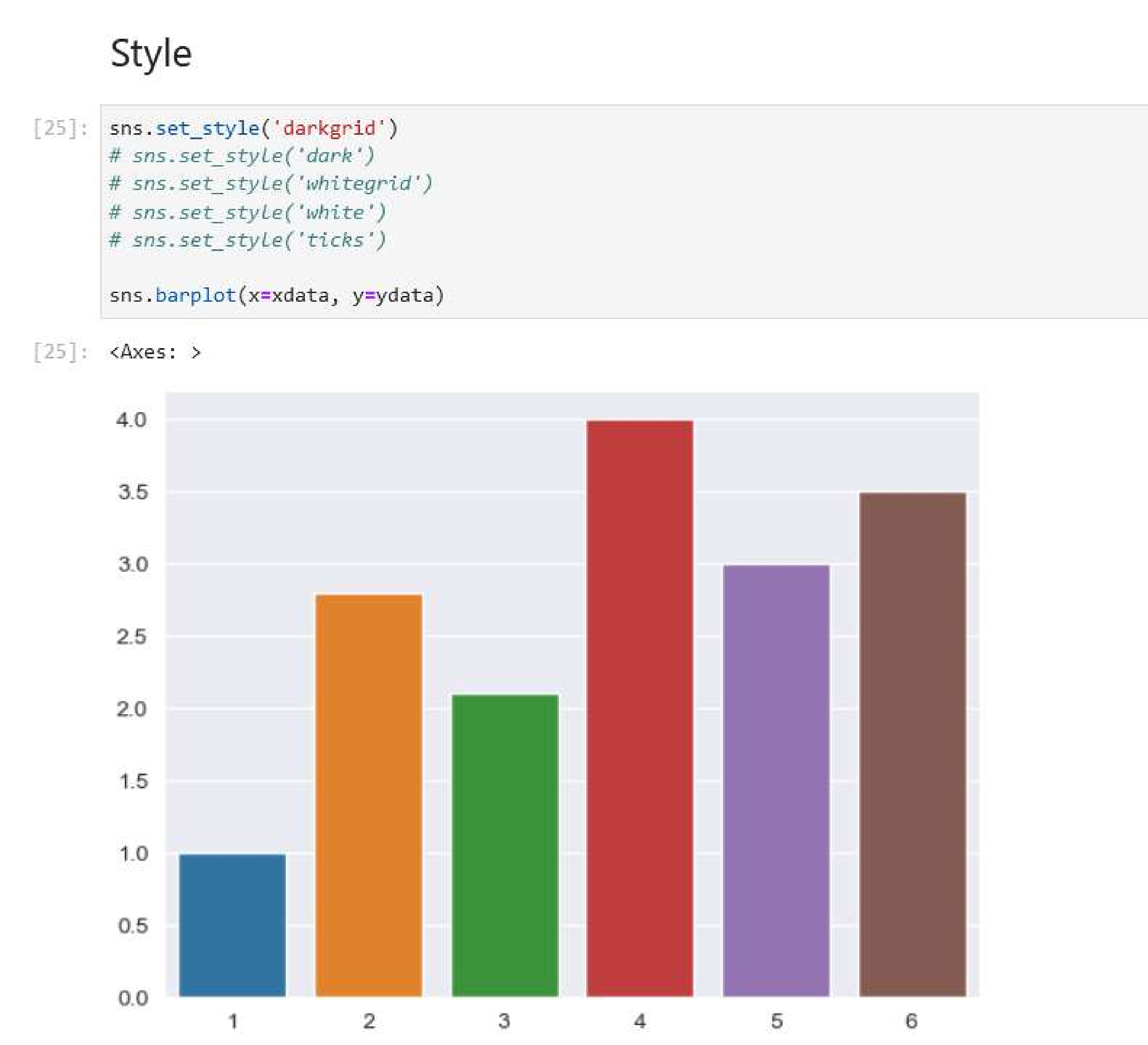
image processing



```
[24]: sns.scatterplot(x=xdata, y=ydata)

[24]: <Axes: >
```

Jupyter Notebook

image processing



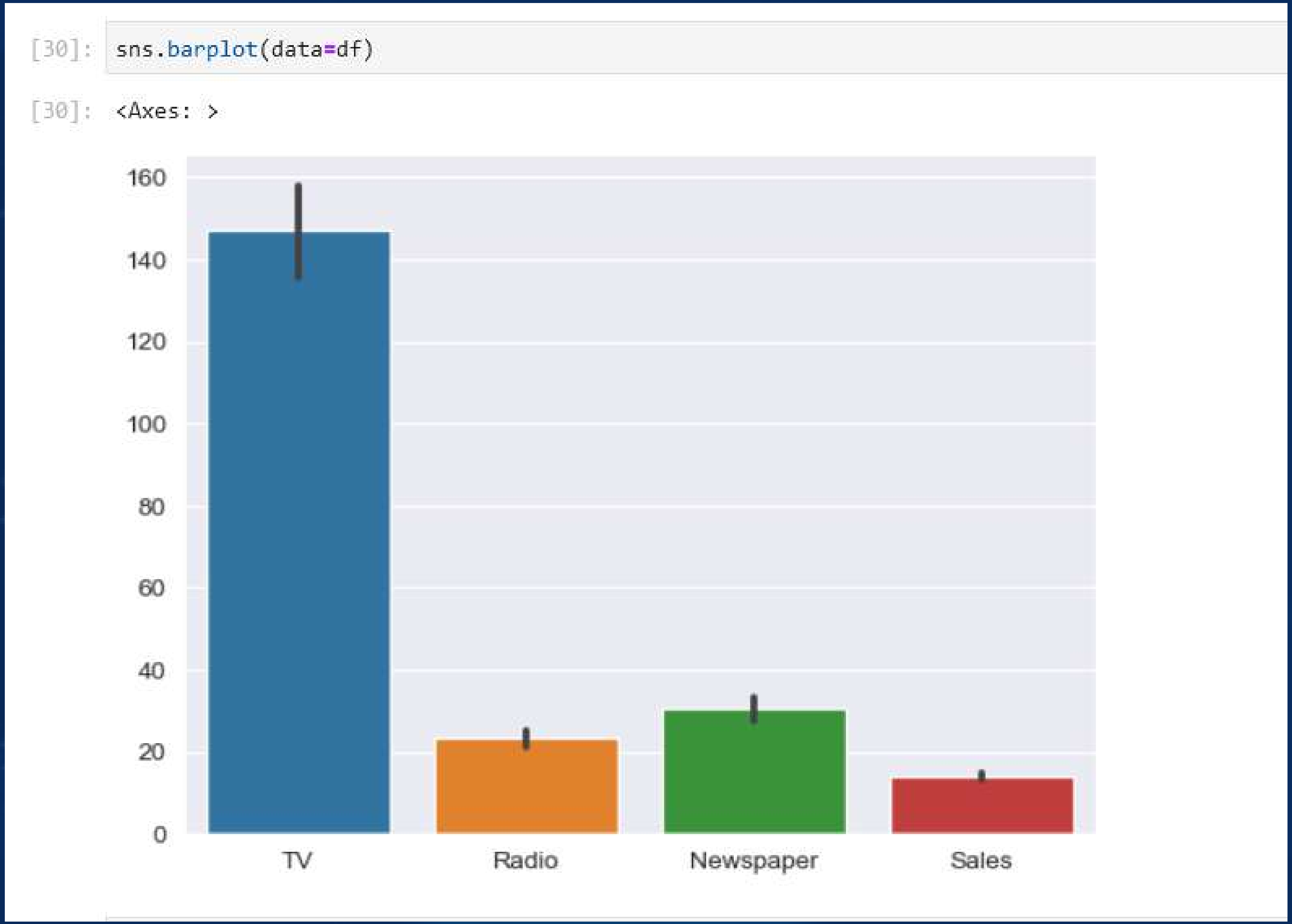
Style

```
[25]: sns.set_style('darkgrid')
      # sns.set_style('dark')
      # sns.set_style('whitegrid')
      # sns.set_style('white')
      # sns.set_style('ticks')

      sns.barplot(x=xdata, y=ydata)
```

```
[25]: <Axes: >
```

Jupyter Notebook

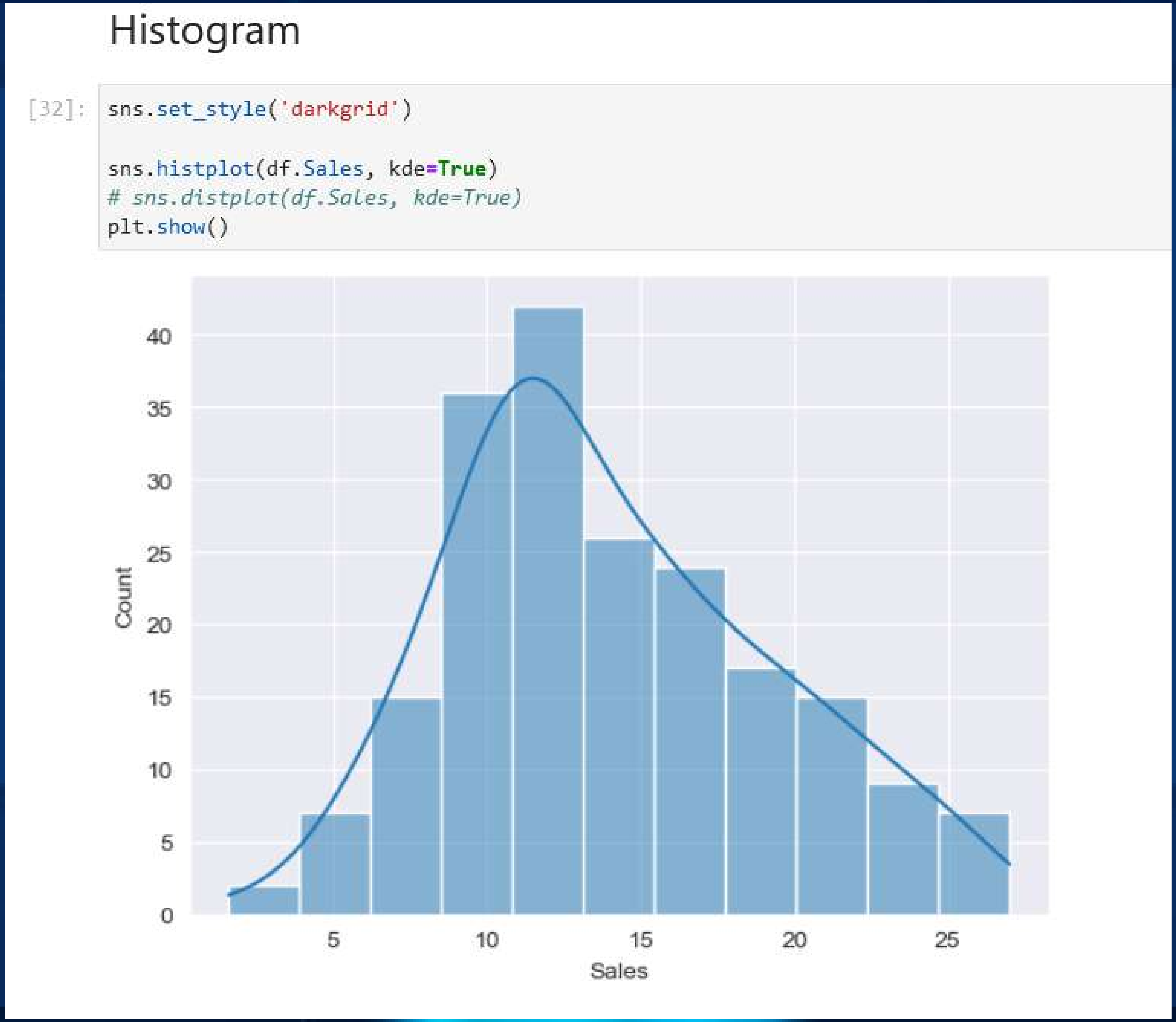
image processing



```
[30]: sns.barplot(data=df)

[30]: <Axes: >
```

Jupyter Notebook

image processing



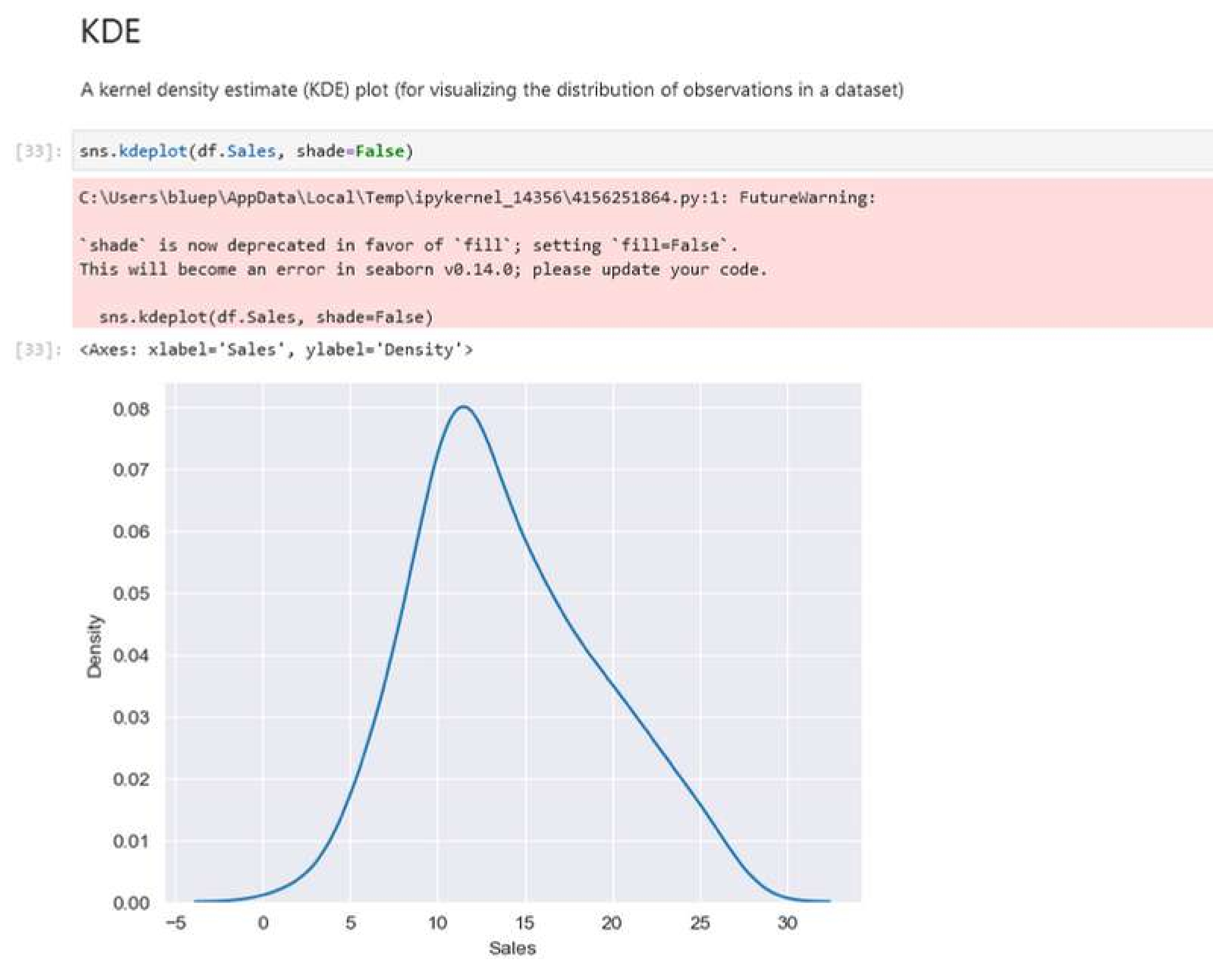
Histogram

[32]:

```
sns.set_style('darkgrid')

sns.histplot(df.Sales, kde=True)
# sns.distplot(df.Sales, kde=True)
plt.show()
```

Jupyter Notebook

image processing



KDE

A kernel density estimate (KDE) plot (for visualizing the distribution of observations in a dataset)

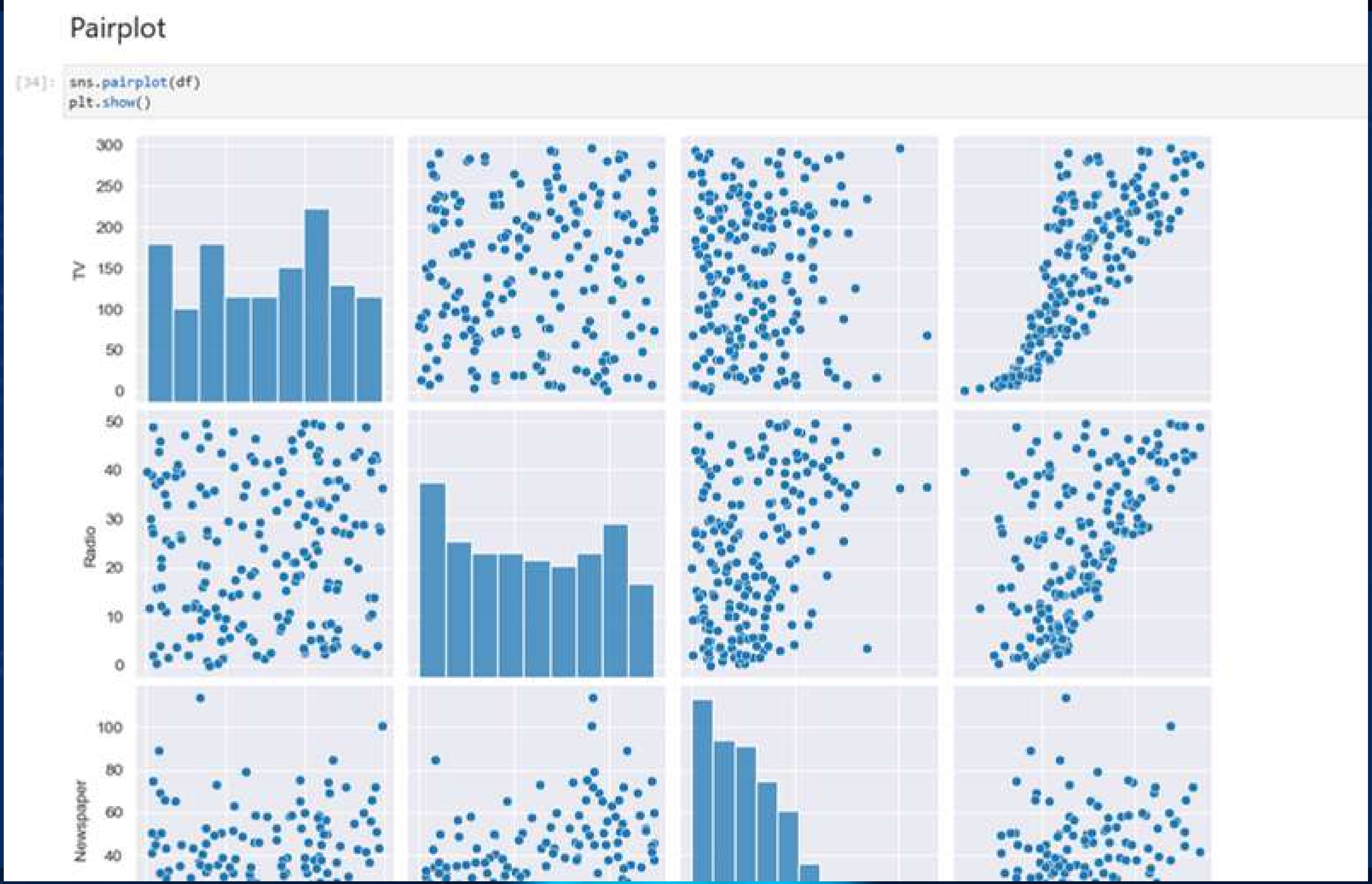
```
[33]: sns.kdeplot(df.Sales, shade=False)
```

```
C:\Users\bluep\AppData\Local\Temp\ipykernel_14356\4156251864.py:1: FutureWarning:

`shade` is now deprecated in favor of `fill`; setting `fill=False`.
This will become an error in seaborn v0.14.0; please update your code.

  sns.kdeplot(df.Sales, shade=False)
```

```
[33]: <Axes: xlabel='Sales', ylabel='Density'>
```

Jupyter Notebook

image processing

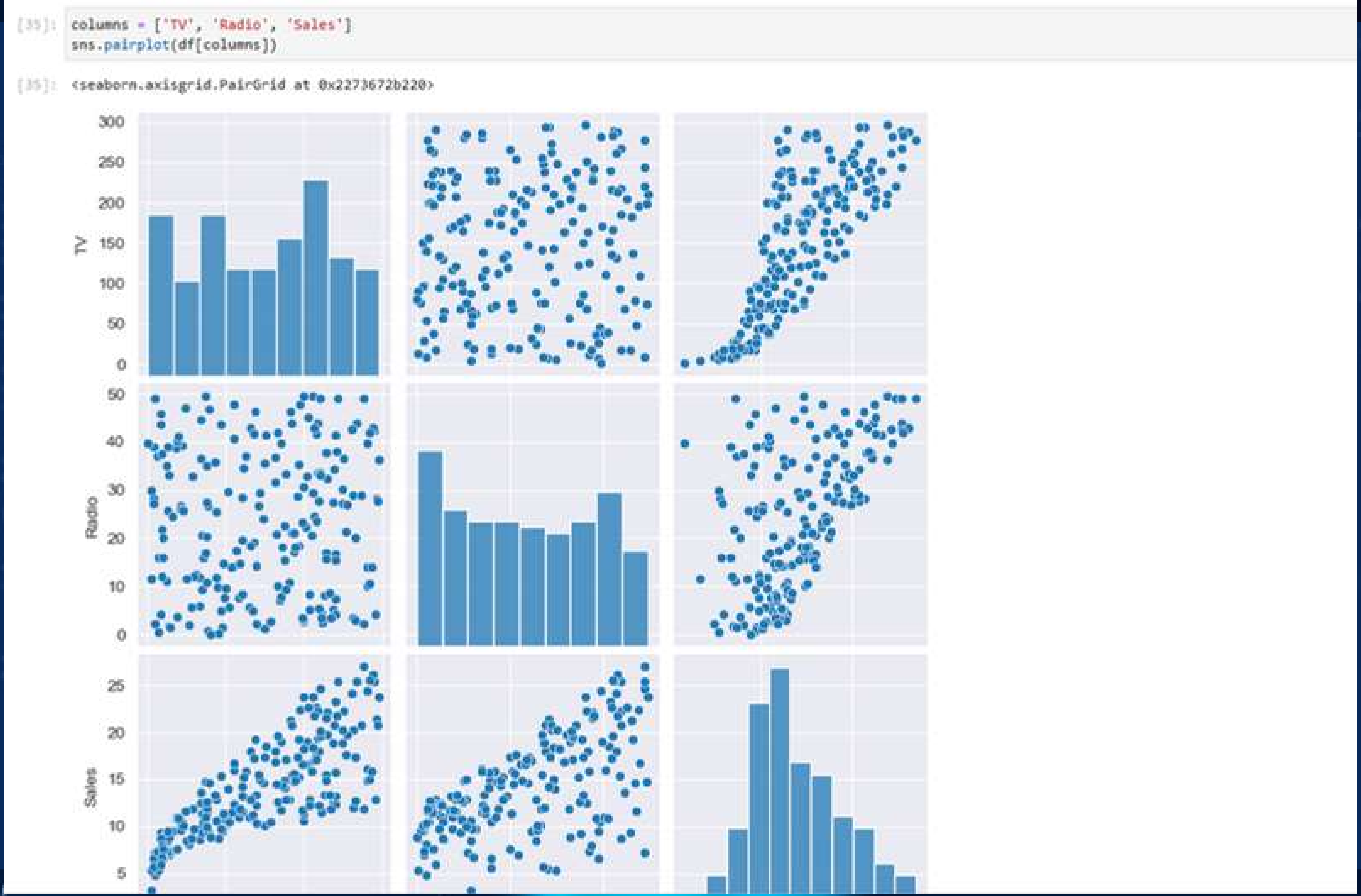


Pairplot

```
[34]: sns.pairplot(df)
      plt.show()
```

Jupyter Notebook

image processing

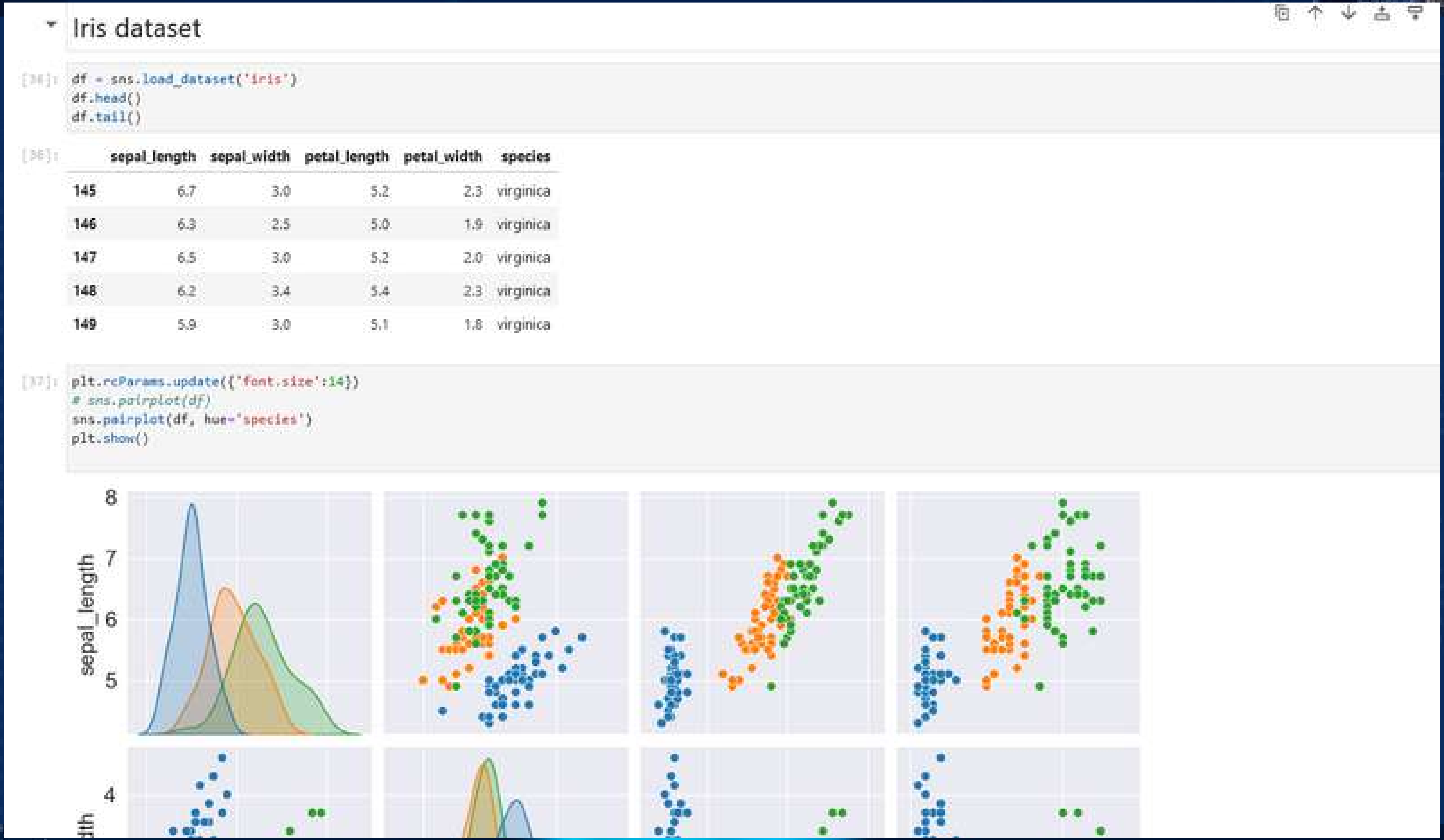


```
[35]: columns = ['TV', 'Radio', 'Sales']
      sns.pairplot(df[columns])
```

```
[35]: <seaborn.axisgrid.PairGrid at 0x2273672b220>
```

Jupyter Notebook

image processing



Iris dataset

[36]:
```
df = sns.load_dataset('iris')
df.head()
df.tail()
```

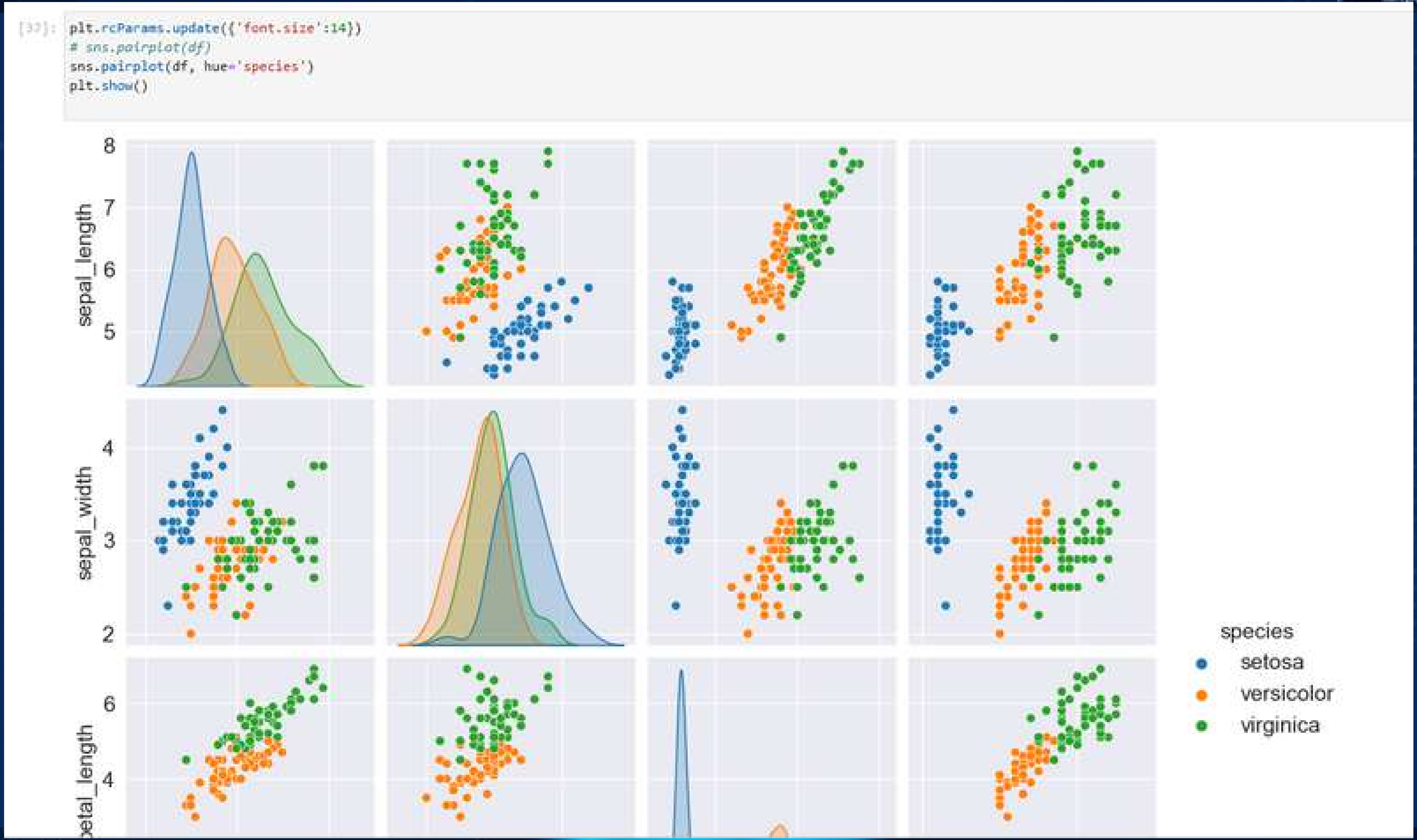
[36]:

	sepal_length	sepal_width	petal_length	petal_width	species
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

[37]:
```
plt.rcParams.update({'font.size':14})
# sns.pairplot(df)
sns.pairplot(df, hue='species')
plt.show()
```

Jupyter Notebook

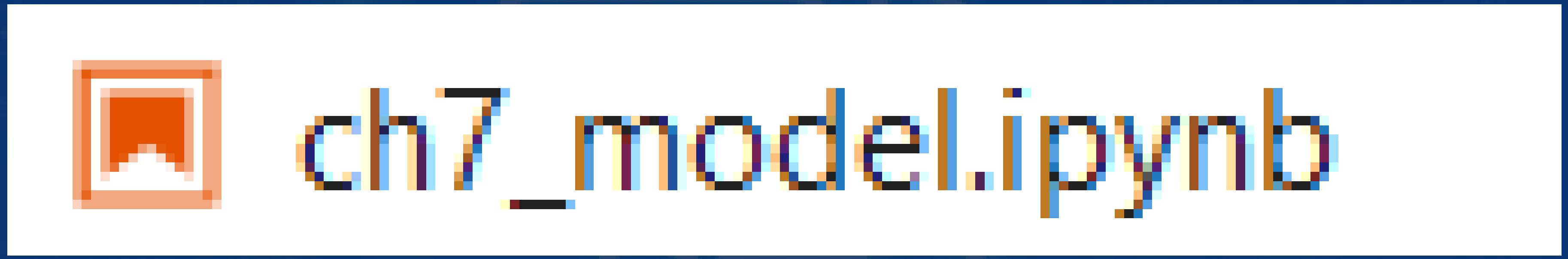
image processing



```
[32]: plt.rcParams.update({'font.size':14})
      # sns.pairplot(df)
      sns.pairplot(df, hue='species')
      plt.show()
```

Jupyter Notebook

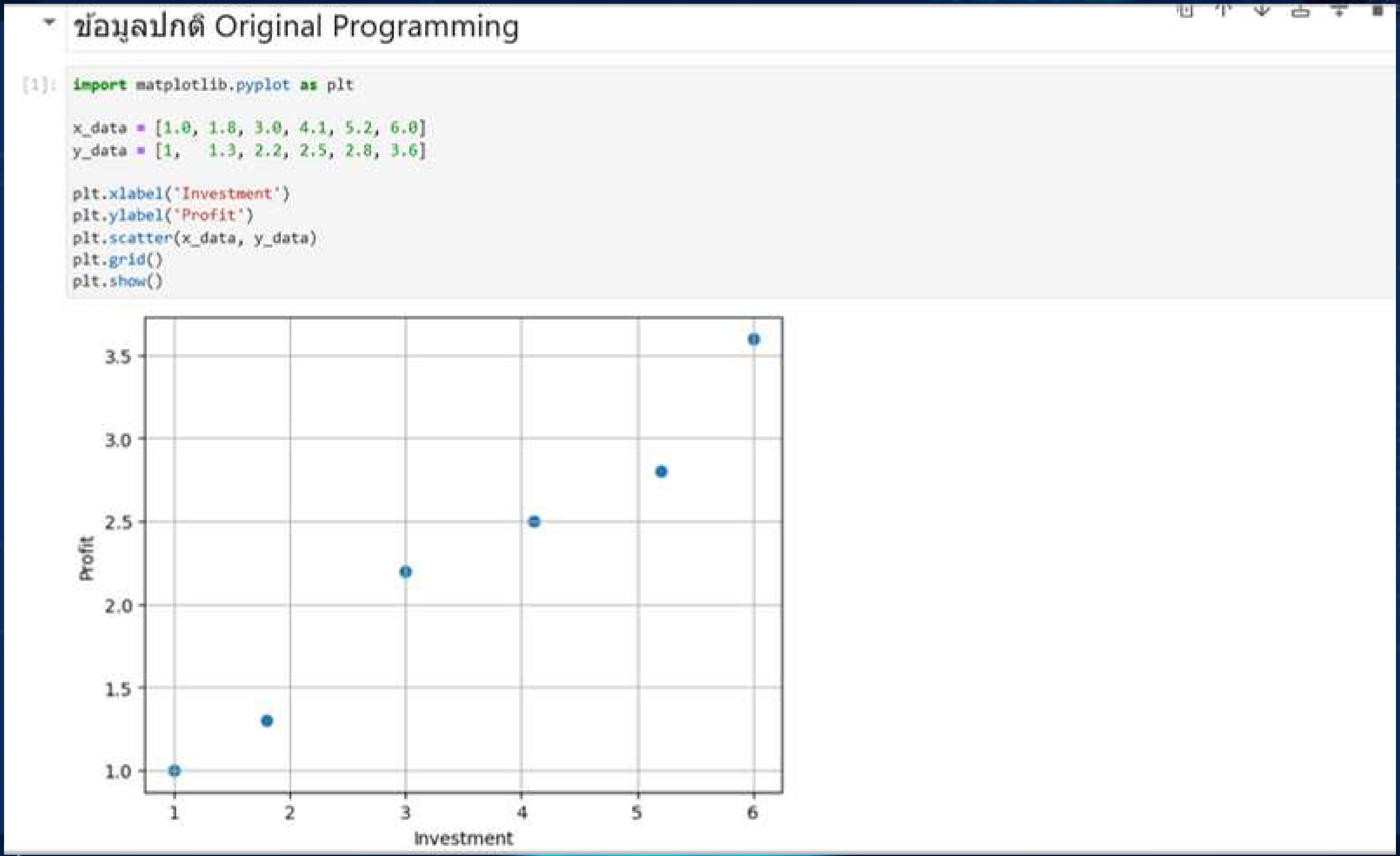
image processing



ch7_model.ipynb

Jupyter Notebook

image processing

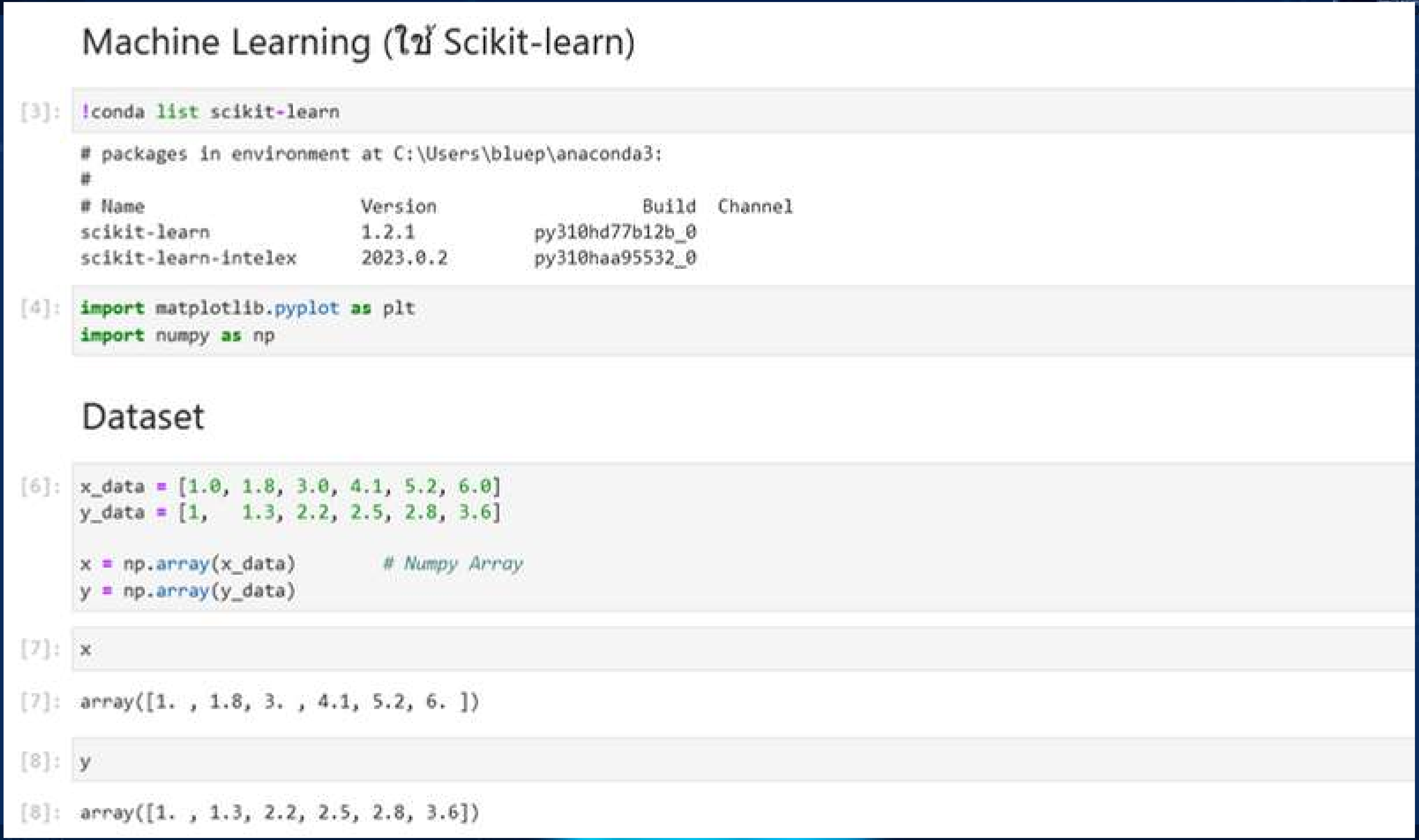


ข้อมูลปกติ Original Programming

```
[1]: import matplotlib.pyplot as plt

x_data = [1.0, 1.8, 3.0, 4.1, 5.2, 6.0]
y_data = [1,   1.3, 2.2, 2.5, 2.8, 3.6]

plt.xlabel('Investment')
plt.ylabel('Profit')
plt.scatter(x_data, y_data)
plt.grid()
plt.show()
```

Jupyter Notebook

image processing



Machine Learning (ใช้ Scikit-learn)

```
[3]: !conda list scikit-learn

# packages in environment at C:\Users\bluep\anaconda3:
#
# Name                    Version                   Build  Channel
scikit-learn              1.2.1           py310hd77b12b_0
scikit-learn-intelex      2023.0.2        py310haa95532_0
```

```
[4]: import matplotlib.pyplot as plt
     import numpy as np
```

Dataset

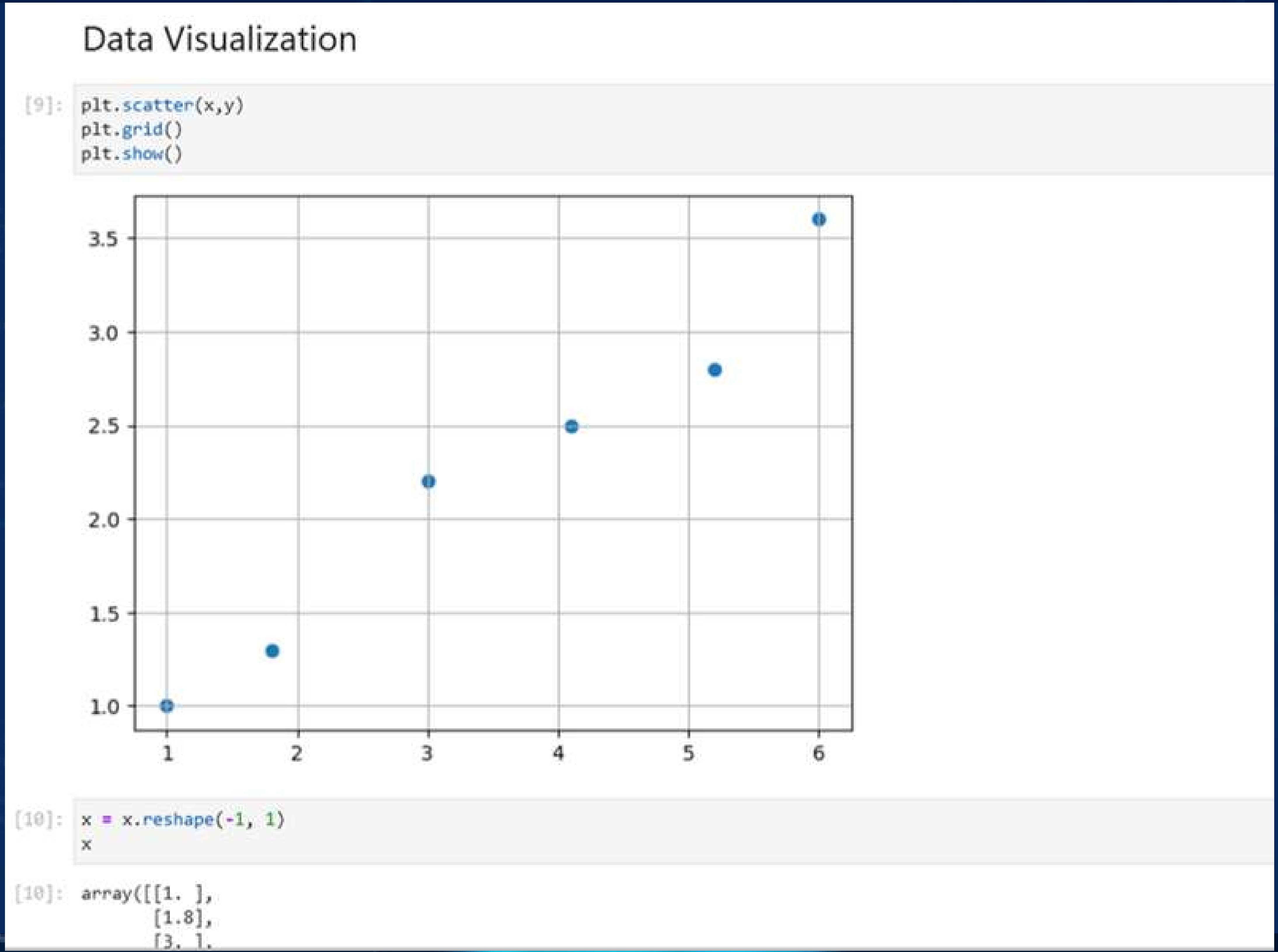
```
[6]: x_data = [1.0, 1.8, 3.0, 4.1, 5.2, 6.0]
     y_data = [1,   1.3, 2.2, 2.5, 2.8, 3.6]

     x = np.array(x_data)       # Numpy Array
     y = np.array(y_data)
```

```
[7]: x

[7]: array([1. , 1.8, 3. , 4.1, 5.2, 6. ])
```

```
[8]: y

[8]: array([1. , 1.3, 2.2, 2.5, 2.8, 3.6])
```

Jupyter Notebook

image processing



Data Visualization

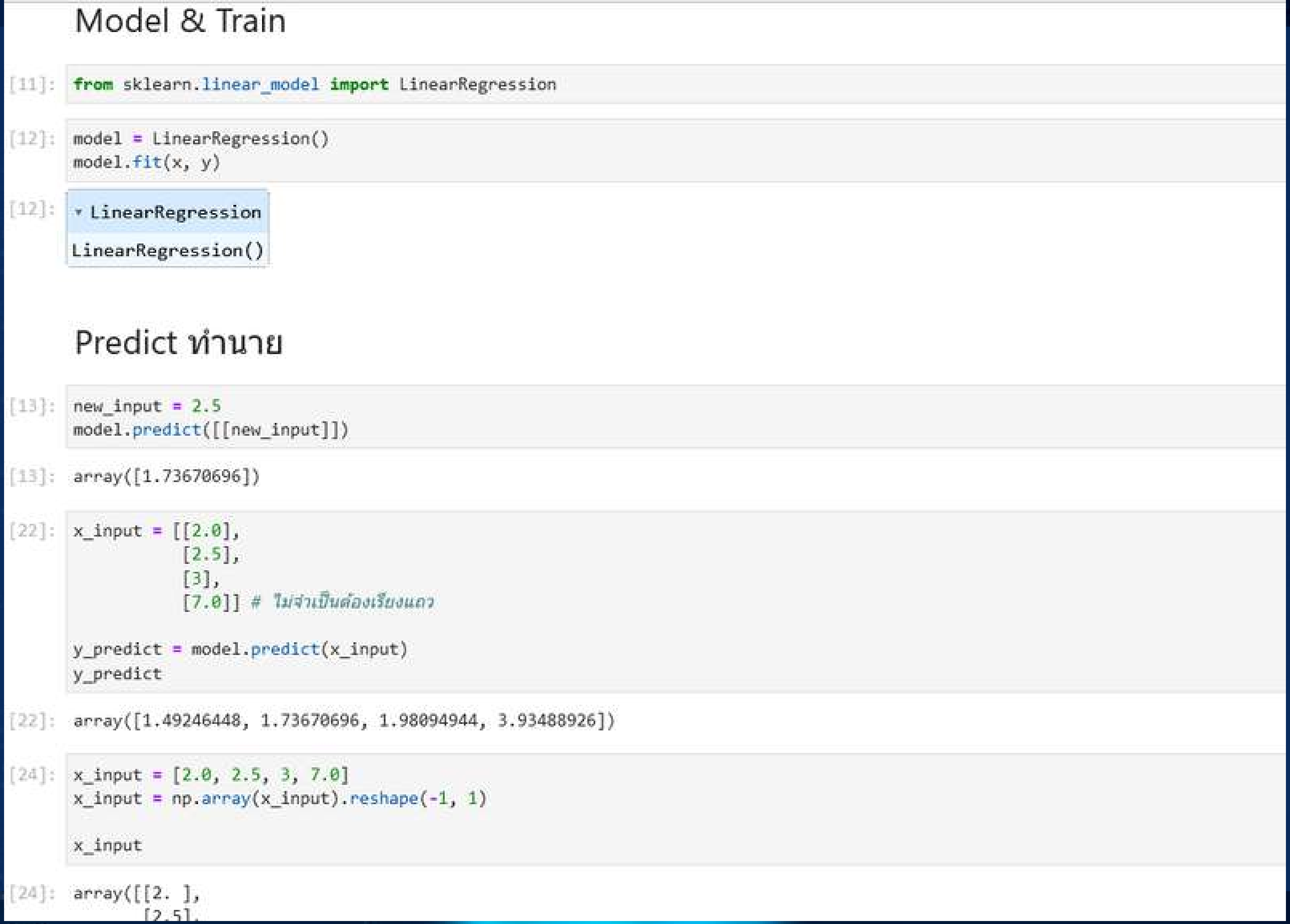
```
[9]: plt.scatter(x,y)
     plt.grid()
     plt.show()
```

```
[10]: x = x.reshape(-1, 1)
      x
```

```
[10]: array([[1. ],
             [1.8],
             [3. ],
```

Jupyter Notebook

image processing



Model & Train

```
[11]: from sklearn.linear_model import LinearRegression
```

```
[12]: model = LinearRegression()
      model.fit(x, y)
```

```
[12]: ▾ LinearRegression
      LinearRegression()
```

Predict ทำนาย

```
[13]: new_input = 2.5
      model.predict([[new_input]])
```

```
[13]: array([1.73670696])
```

```
[22]: x_input = [[2.0],
                 [2.5],
                 [3],
                 [7.0]] # ไม่จำเป็นต้องเรียงแถว

      y_predict = model.predict(x_input)
      y_predict
```

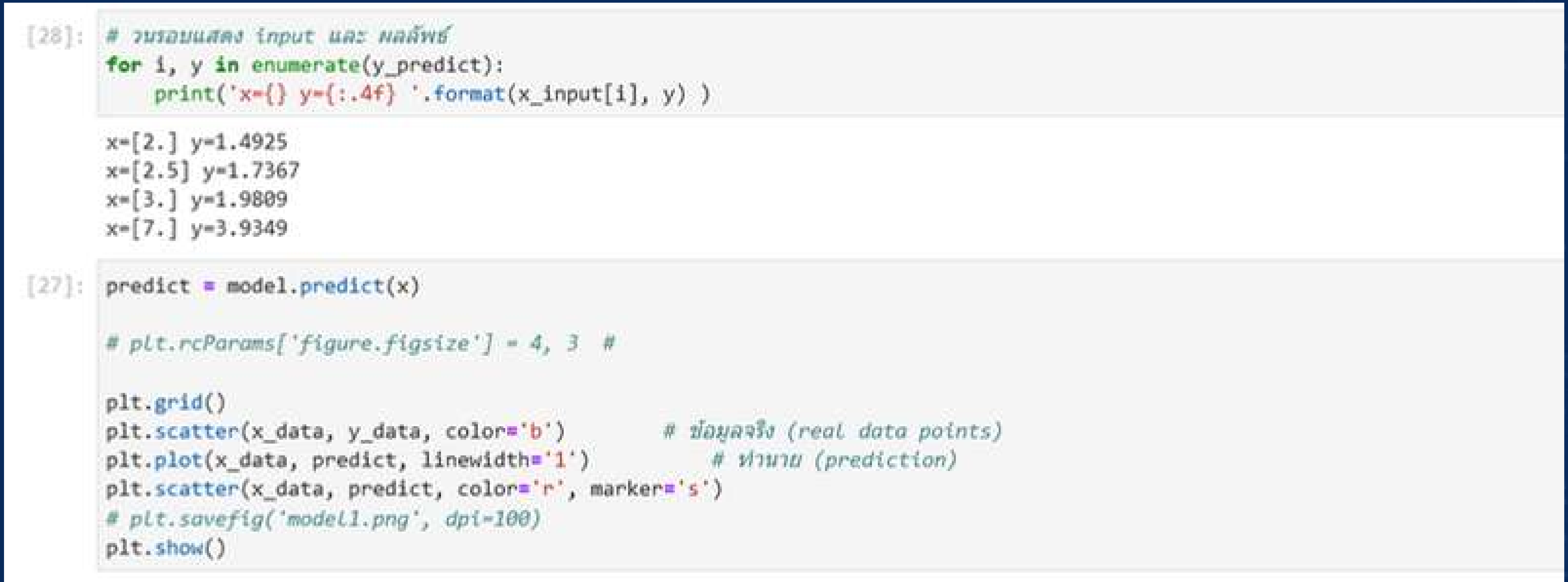
```
[22]: array([1.49246448, 1.73670696, 1.98094944, 3.93488926])
```

```
[24]: x_input = [2.0, 2.5, 3, 7.0]
      x_input = np.array(x_input).reshape(-1, 1)

      x_input
```

```
[24]: array([[2. ],
             [2.5],
```

Jupyter Notebook

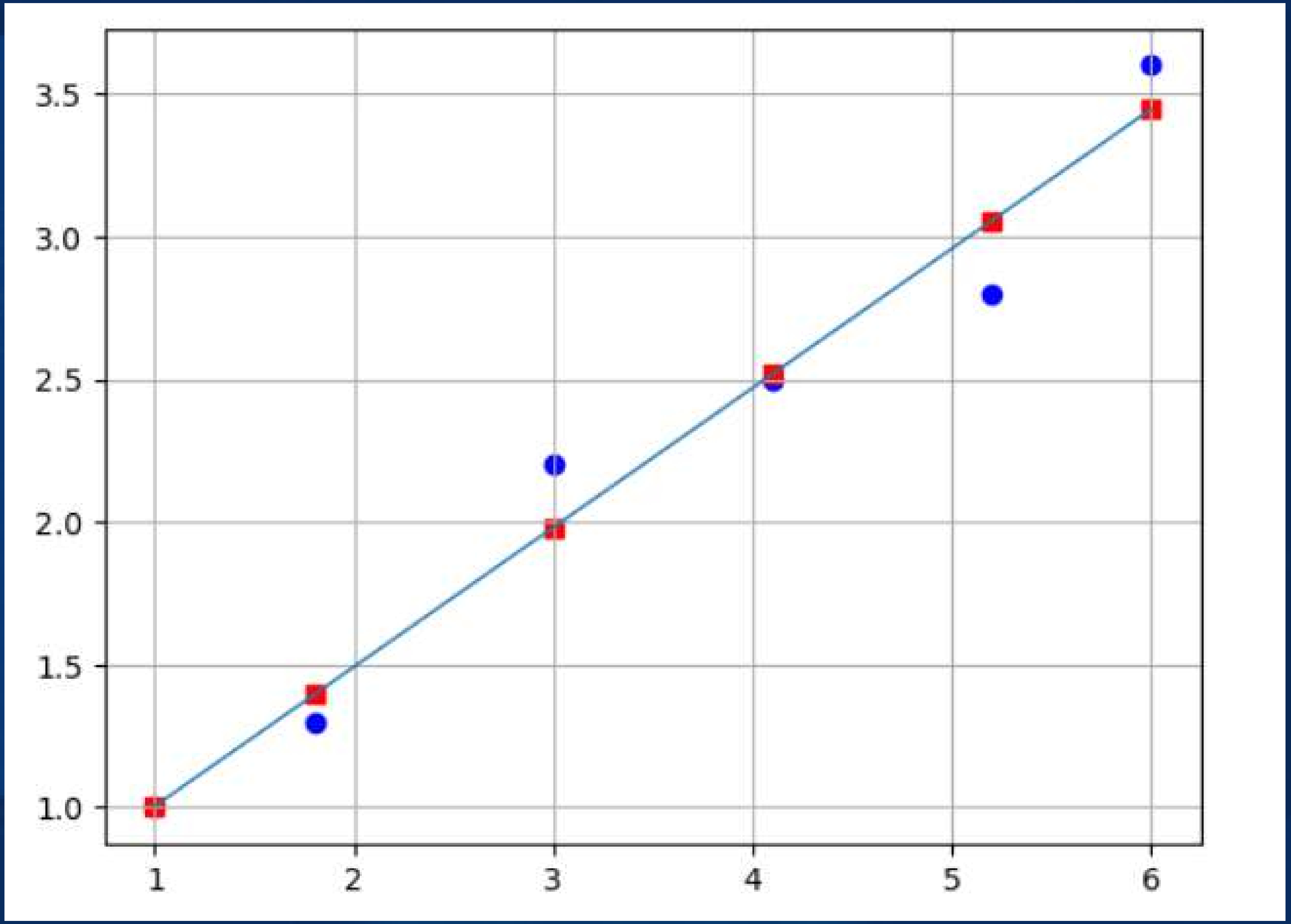
image processing



```
[28]: # วนรอบแสดง input และ ผลลัพธ์
      for i, y in enumerate(y_predict):
          print('x={} y={:.4f} '.format(x_input[i], y) )

      x=[2.] y=1.4925
      x=[2.5] y=1.7367
      x=[3.] y=1.9809
      x=[7.] y=3.9349

[27]: predict = model.predict(x)

      # plt.rcParams['figure.figsize'] = 4, 3  #

      plt.grid()
      plt.scatter(x_data, y_data, color='b')        # ข้อมูลจริง (real data points)
      plt.plot(x_data, predict, linewidth='1')          # ทำนาย (prediction)
      plt.scatter(x_data, predict, color='r', marker='s')
      # plt.savefig('model1.png', dpi=100)
      plt.show()
```

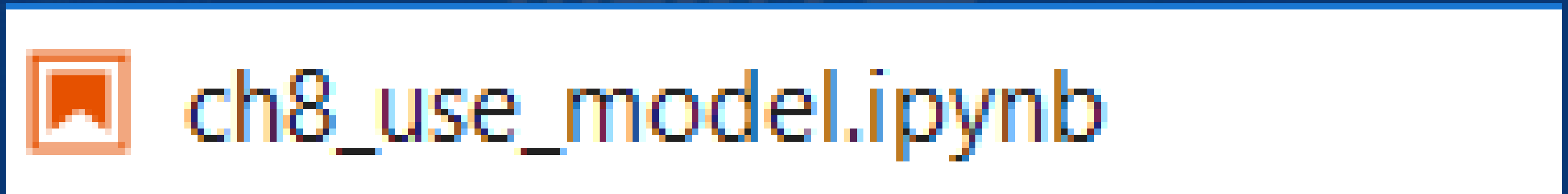
Jupyter Notebook

image processing



Jupyter Notebook

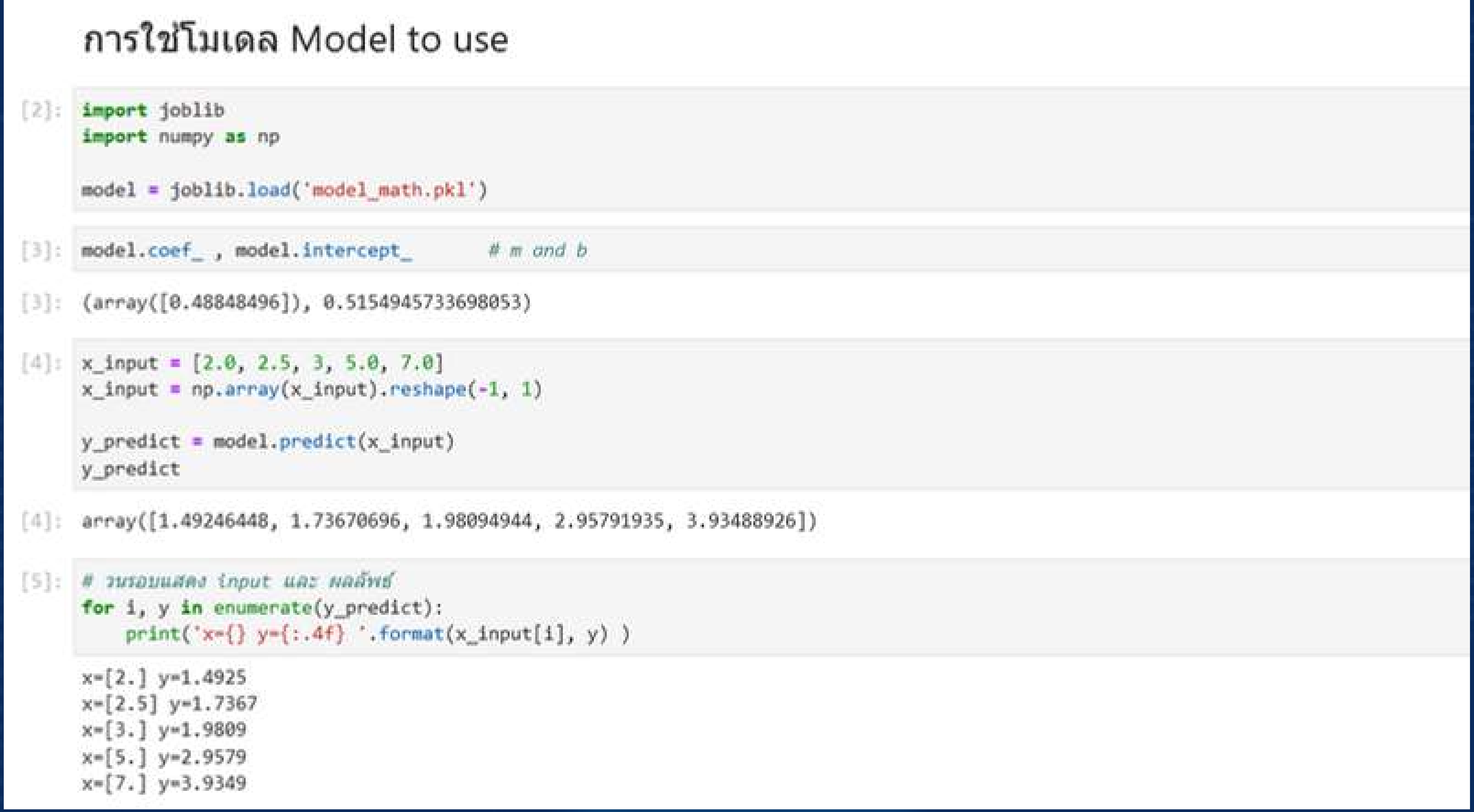
image processing



ch8_use_model.ipynb

Jupyter Notebook

image processing



การใช้โมเดล Model to use

```
[2]: import joblib
     import numpy as np

     model = joblib.load('model_math.pkl')
```

```
[3]: model.coef_ , model.intercept_       # m and b
```

```
[3]: (array([0.48848496]), 0.5154945733698053)
```

```
[4]: x_input = [2.0, 2.5, 3, 5.0, 7.0]
     x_input = np.array(x_input).reshape(-1, 1)

     y_predict = model.predict(x_input)
     y_predict
```

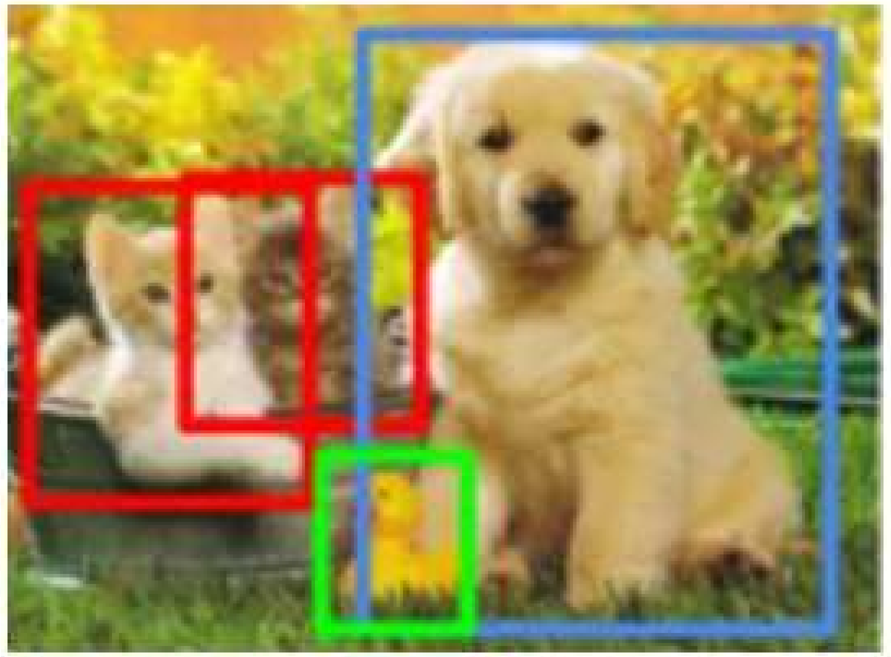
```
[4]: array([1.49246448, 1.73670696, 1.98094944, 2.95791935, 3.93488926])
```

```
[5]: # วนรอบแสดง input และ ผลลัพธ์
     for i, y in enumerate(y_predict):
         print('x={} y={:.4f} '.format(x_input[i], y) )
```

```
x=[2.] y=1.4925
x=[2.5] y=1.7367
x=[3.] y=1.9809
x=[5.] y=2.9579
x=[7.] y=3.9349
```

IMAGE CLASSIFICATION

เช่นเดียวกับหลักการของ AI เราต้องส่งรูปเข้าไปพร้อมกับผลลัพธ์ว่า นี่คือรูปแมว เพื่อให้มันเรียนรู้เรื่อยๆ และนี่คืองานหลักของสิ่งที่เรียกว่า Image Classification



น้องแมวแอนด์เดอะแก๊งค์

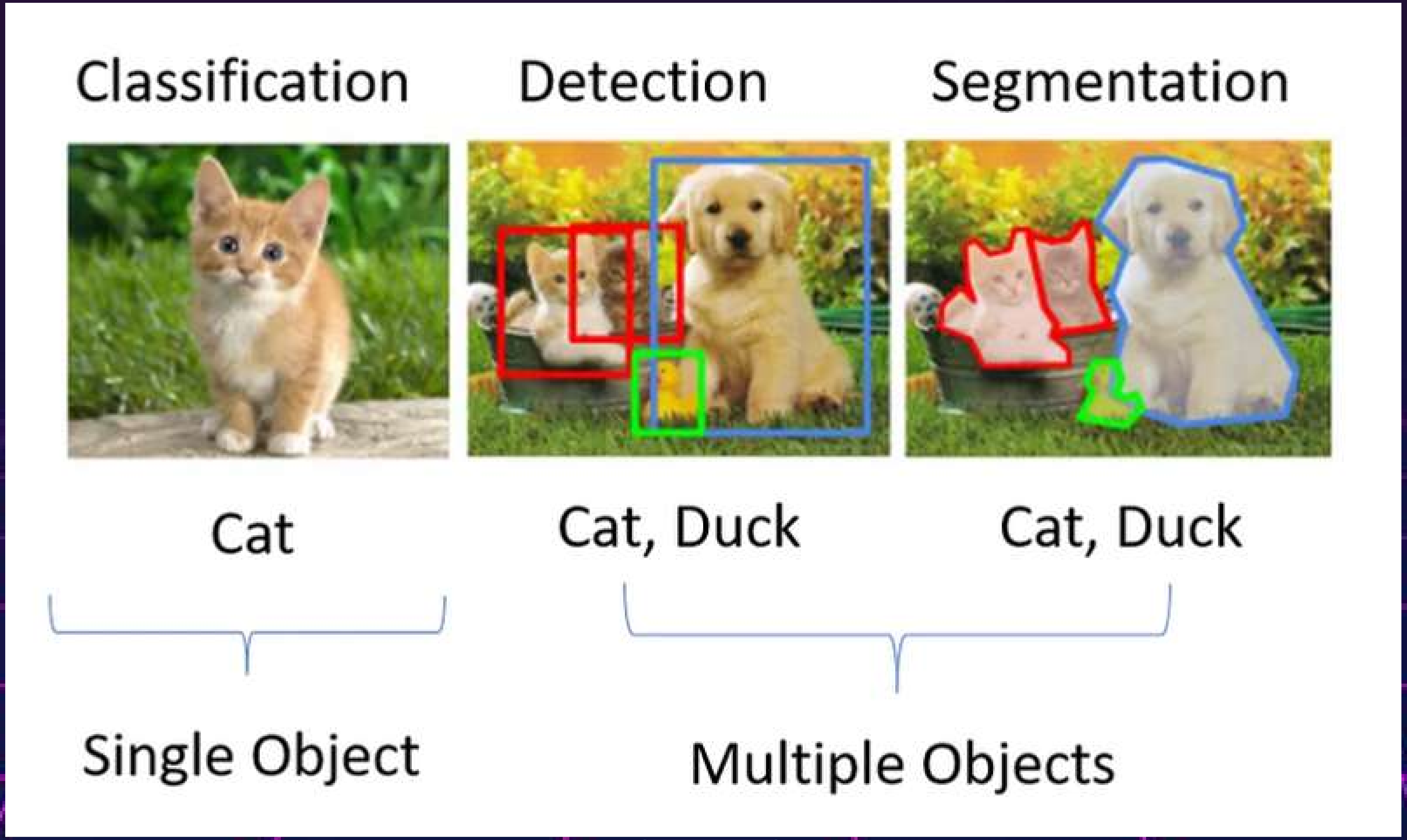
แล้วแมวมันอยู่ตรงไหนของรูปหล่ะ? ถ้าได้โจทย์มาเป็นแบบนี้ จะเป็นโจทย์อีกแนวที่เรียกว่า Image Detection โดยมันจะบอกถึงตำแหน่งของรูปด้วย

บทความ ความรู้ image classification to AI :

EXIT

IMAGE CLASSIFICATION

ภาพรวมของโจทย์โดยรวม คือ



EXIT

IMAGE CLASSIFICATION

Medical Sector

บางครั้งเวลาที่มีรูป X-ray ออกมา ในการตรวจเช็ครูปนั้นจะต้องใช้หมอเฉพาะทางที่มีจำกัด ถ้าเรามี AI คอยช่วย Focus หรือตีกรอบส่วนที่มีปัญหา จะลดเวลาในส่วนนี้มาก รวมถึงอาจจะใช้งานร่วมกับ Image Segmentation ได้ จากรูปด้านล่าง เขาวิเคราะห์เรื่องตำแหน่งของเนื้องอกในสมองครับ

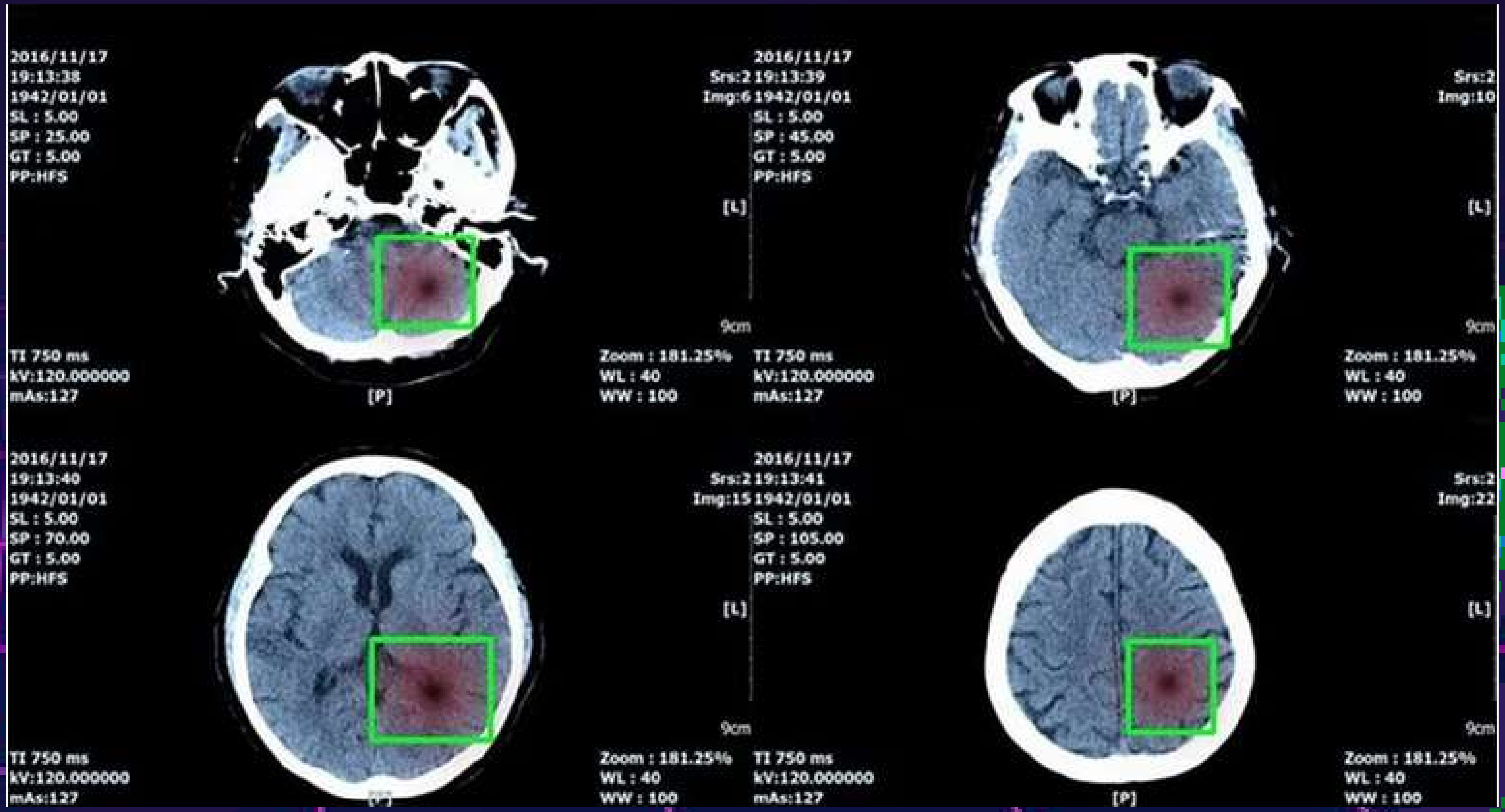
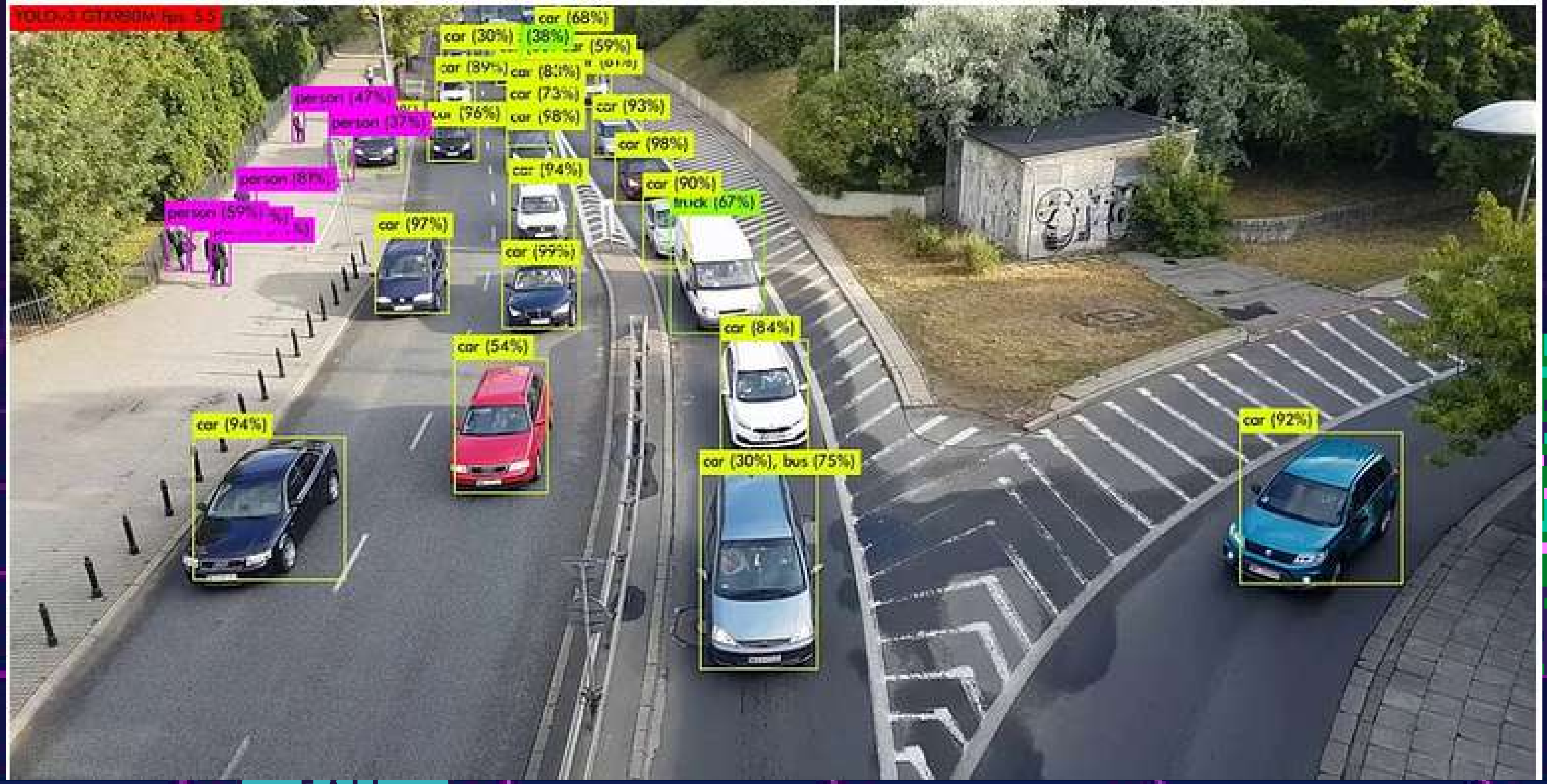


IMAGE CLASSIFICATION

Traffic Sector

อีกตัวอย่าง เวลาที่เราขับรถบนท้องถนน ก็จะมีกล้องที่คอยเช็คความเร็วหรืออาจจะตรวจสอบว่ารถติดไหม เราสามารถนำ AI นี้ไปช่วยได้ว่ามีรถบนถนนเยอะหรือไม่แล้วไปเชื่อมกับระบบอื่น (รวมไปถึงรถกำลังจะเข้าเส้นทึบไหม)

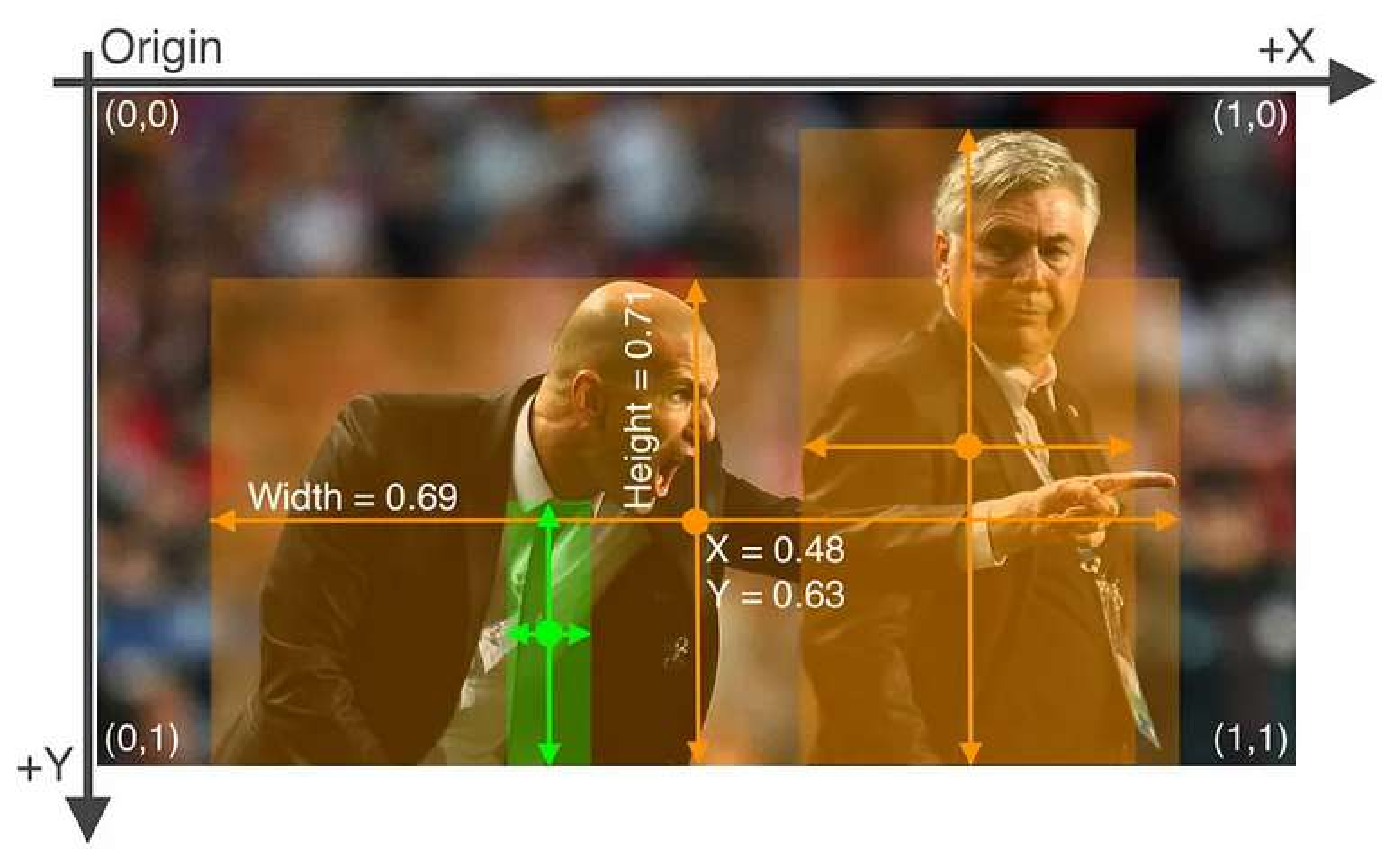


YOLOV5 คืออะไร ?

มันคือ ‘You only look once’ ซึ่งจะเป็นหลักการทำงานของมัน และในปัจจุบันมีถึง Version 5 แล้ว โดยตัว YOLO นี้คือสถาปัตยกรรมที่ทาง ultralytics ได้ออกแบบไว้เพื่อทำ Image Detection ได้อย่างรวดเร็วและมีประสิทธิภาพ

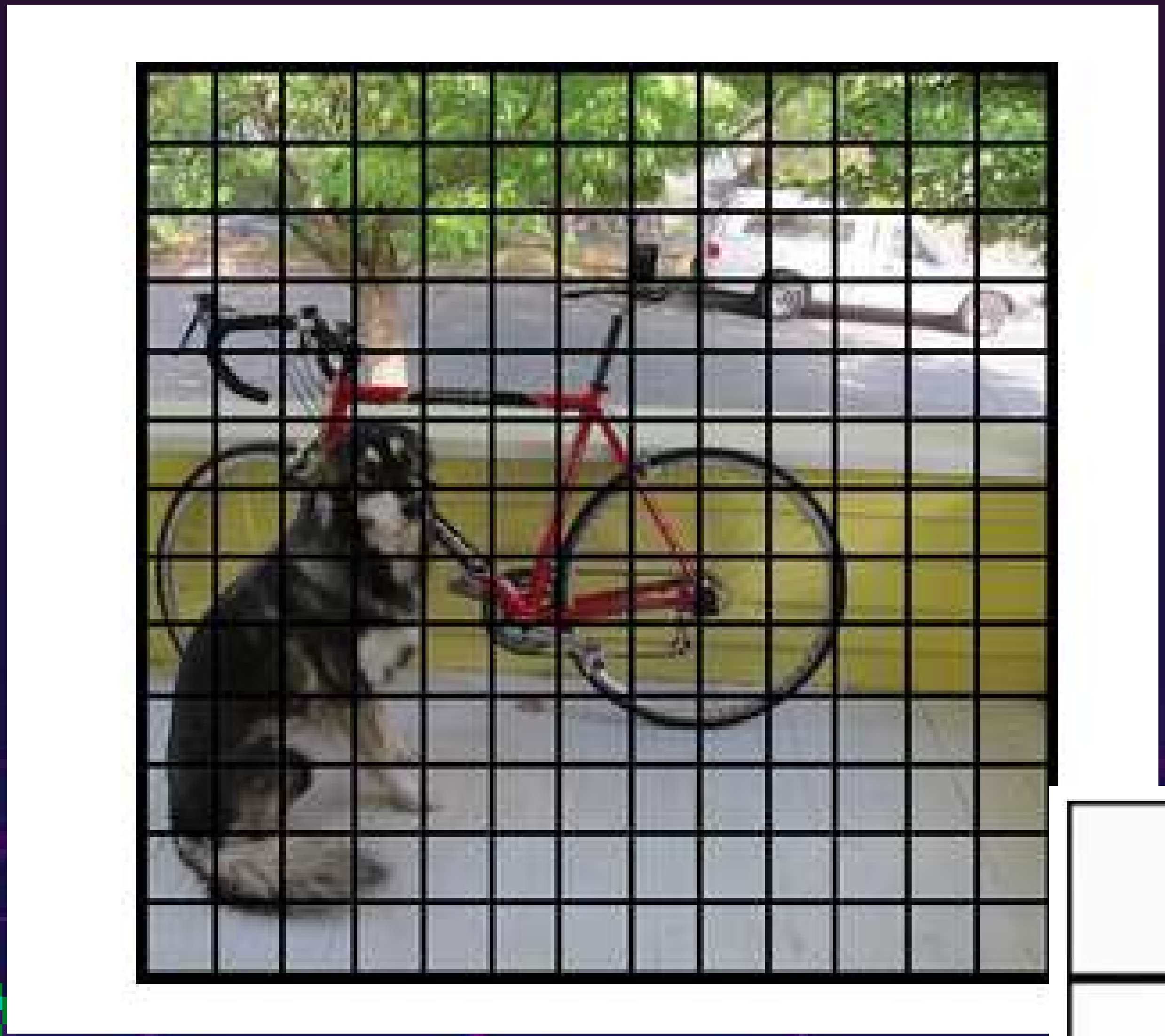
EXIT

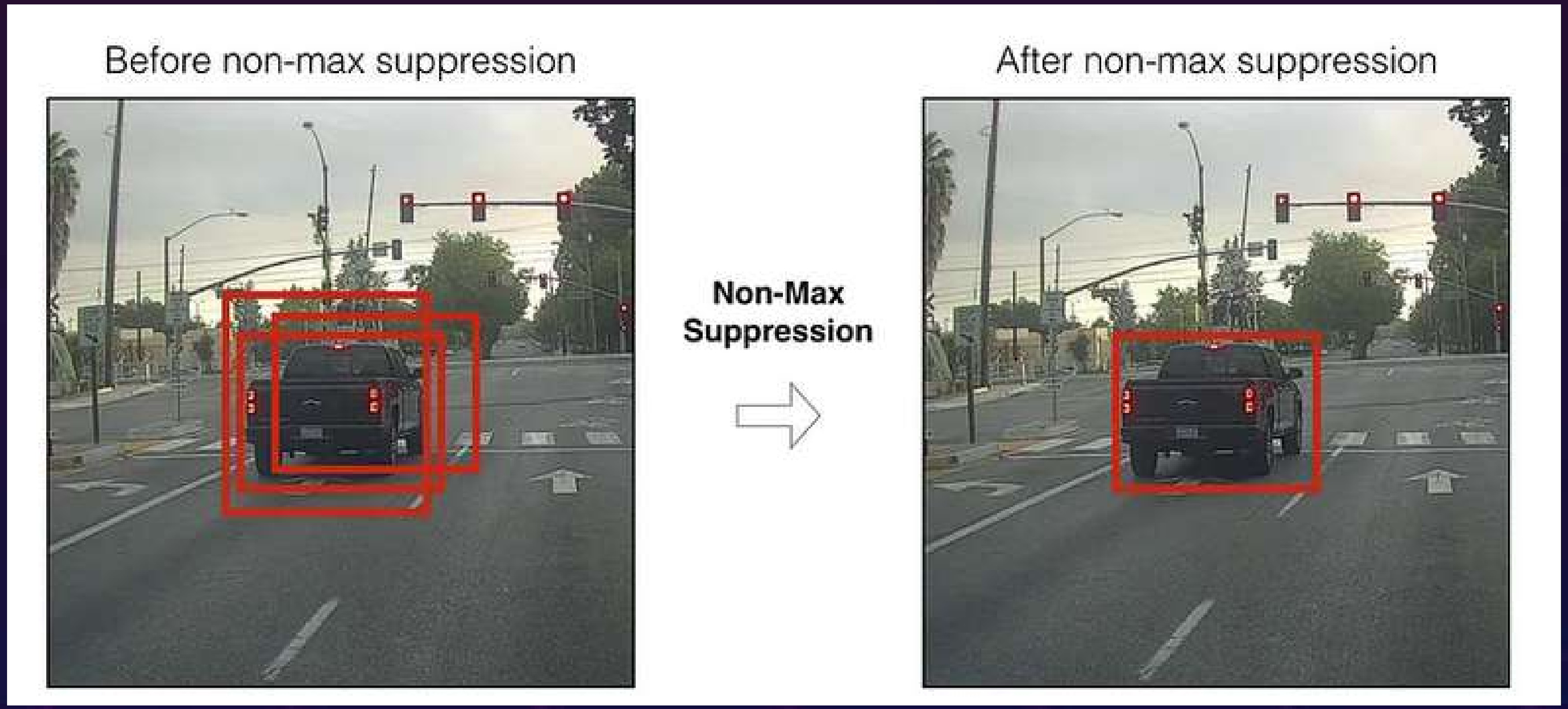
YOLOV5 คืออะไร ?

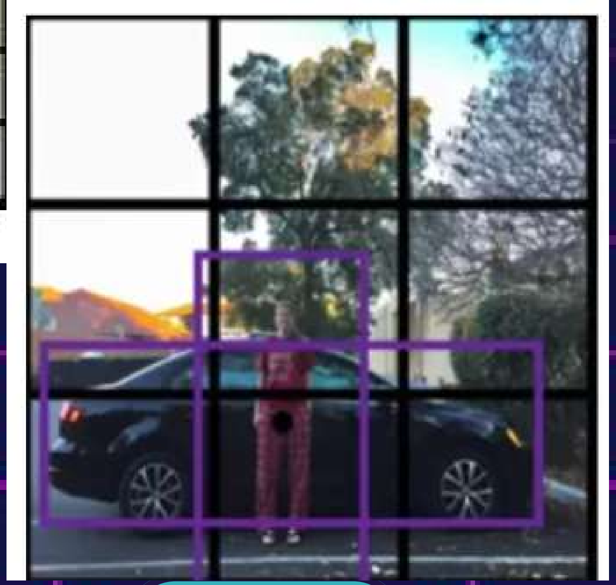


EXIT

YOLOV5 คืออะไร ?







layer ที่ predict ได้
มีการจัดกระทำ intersection

การ grid ในแต่ละส่วนของภาพ
เพื่อดู elements pixel

EXIT

การติดตั้ง YOLOV5

5 ขั้นตอน)

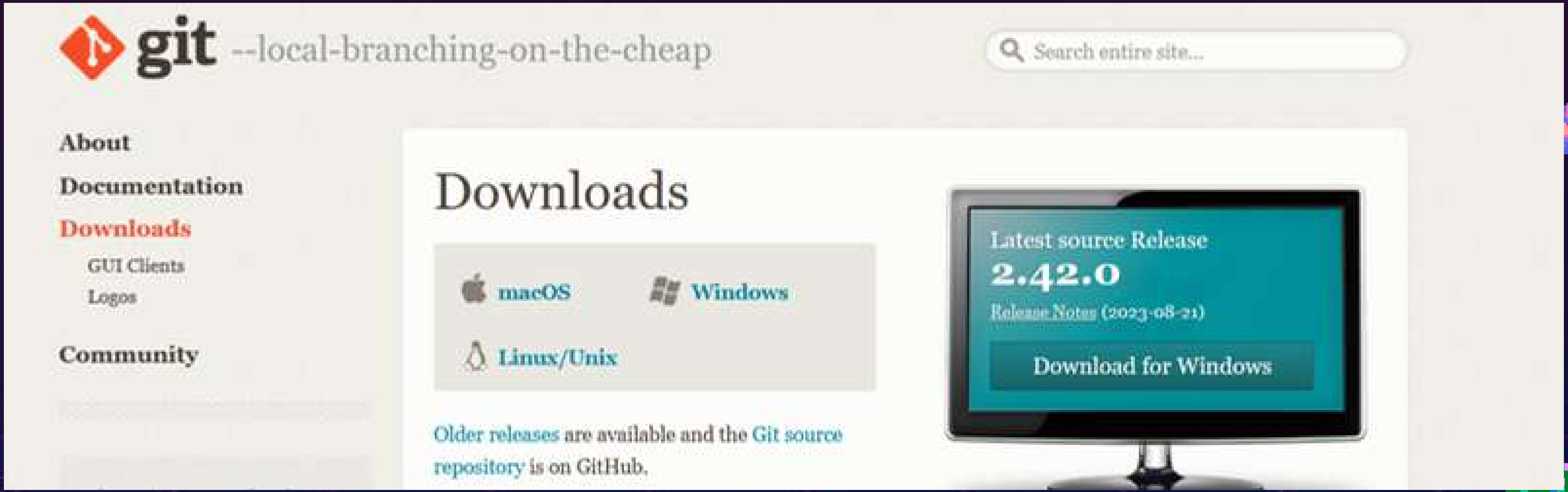
1) Image Detection
2) การดึงชุดข้อมูลและจัดเตรียม (Data Gathering and Collecting)
3) การกำหนดผลลัพธ์ (Data Labeling) และการทำ Image Augmentation)
4) การสร้างโมเดลและวัดผล (Modelling)
5) การนำโมเดลไปประยุกต์ใช้ (Deployment)

บทความ medium yolov5 :

EXIT

การติดตั้ง YOLOV5

1.



git --local-branching-on-the-cheap

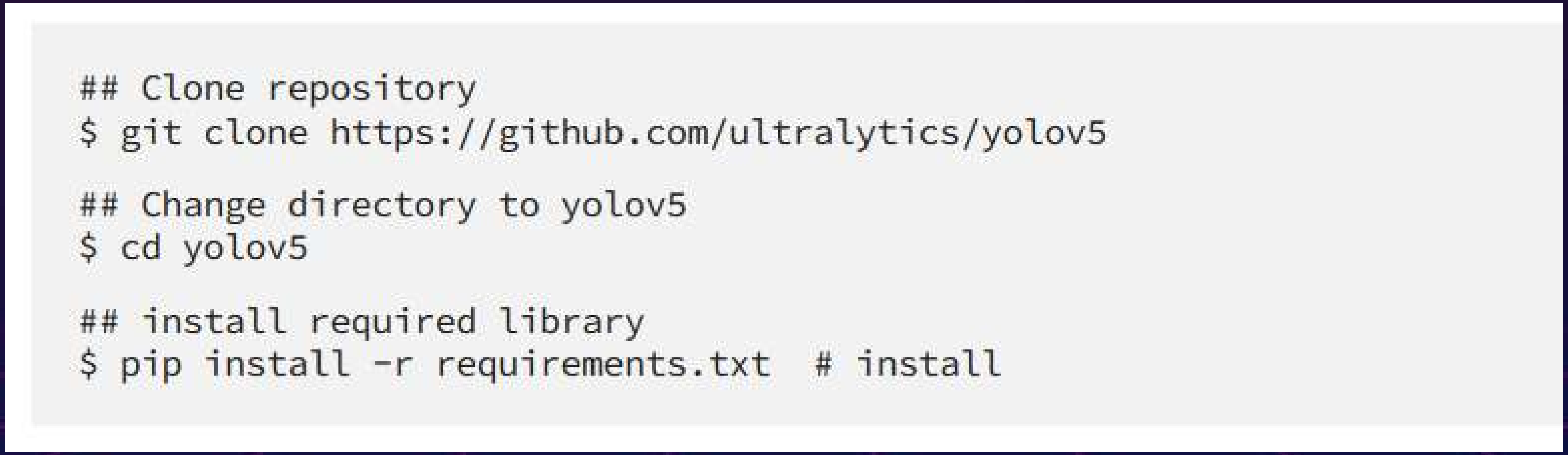
Downloads

Older releases are available and the Git source repository is on GitHub.

Latest source Release
2.42.0
Release Notes (2023-08-21)

การติดตั้ง YOLOV5

1. ดาวน์โหลด YOLOv5 เราสามารถเริ่มดาวน์โหลดและติดตั้ง Library ที่ต้องใช้



```
## Clone repository
$ git clone https://github.com/ultralytics/yolov5

## Change directory to yolov5
$ cd yolov5

## install required library
$ pip install -r requirements.txt  # install
```

EXIT

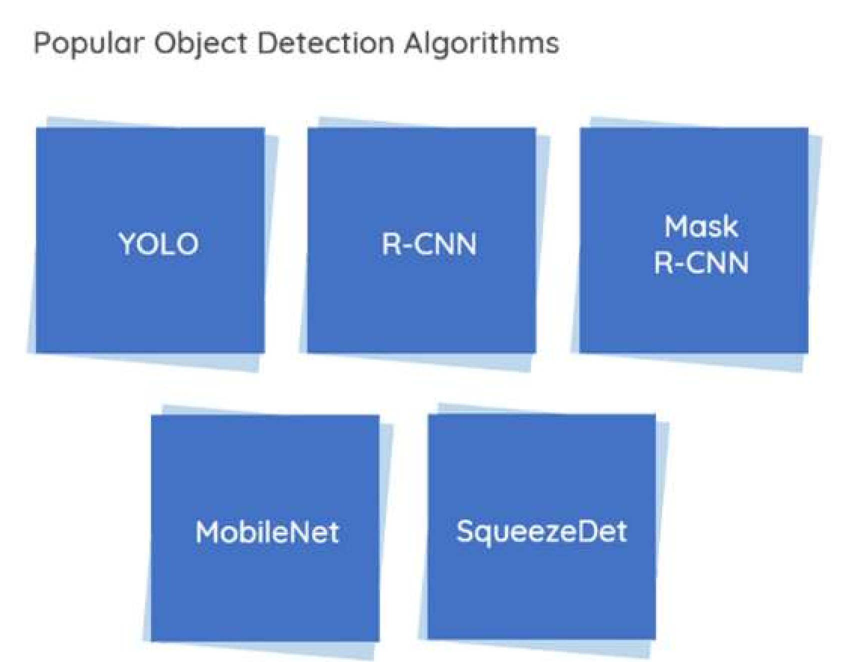
LAB
การทดลองใช้ YOLOV5

EXIT

การใช้ YOLOV3

เพื่อจัดหมวดหมู่ Classification Detect ของ Person ในรูปแบบ 0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ


Popular Object Detection Algorithms

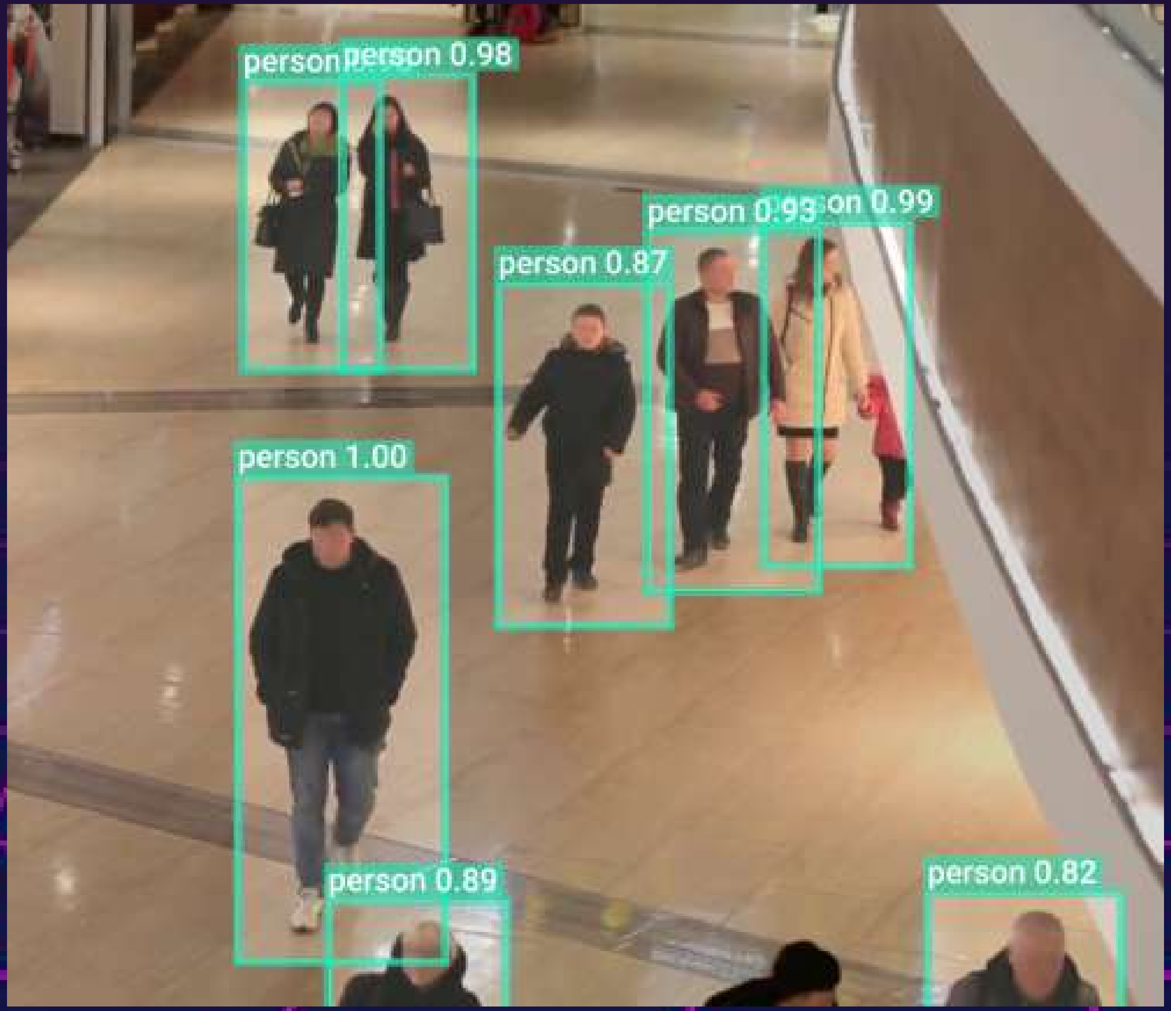
YOLO

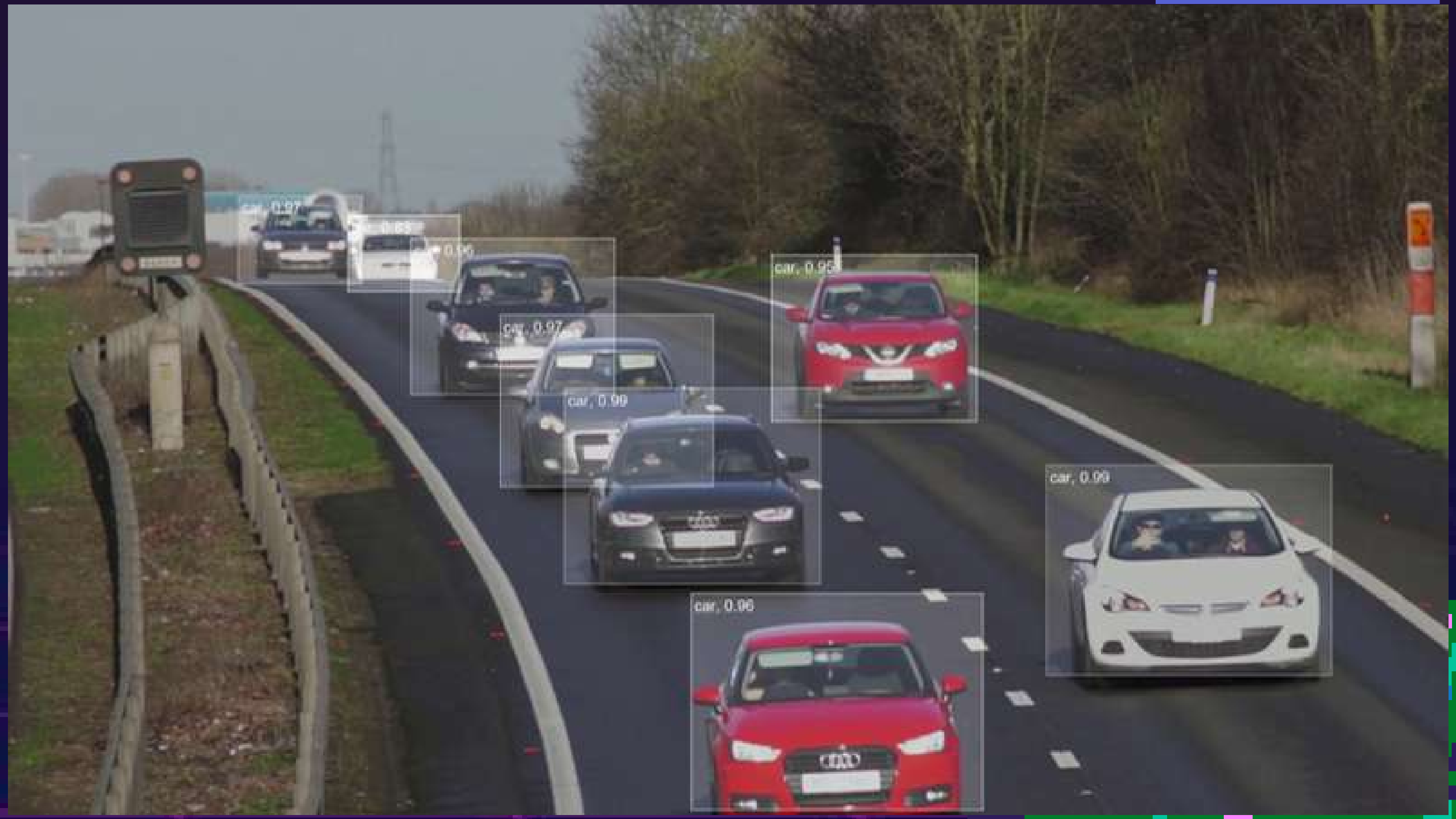
R-CNN

Mask R-CNN

MobileNet

SqueezeDet





EXIT

การใช้ YOLOV3

0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ

STEP 1 :

```
pip install opencv-python-headless requests
```

โหลด model , configuration และ coco name tag คน

STEP 2 :

YOLOv3 weights file:

- https://pjreddie.com/media/files/yolov3.weights

YOLOv3 configuration file:

- https://github.com/pjreddie/darknet/blob/master/cfg/yolov3.cfg

YOLOv3 class names file:

- https://github.com/pjreddie/darknet/blob/master/data/coco.names

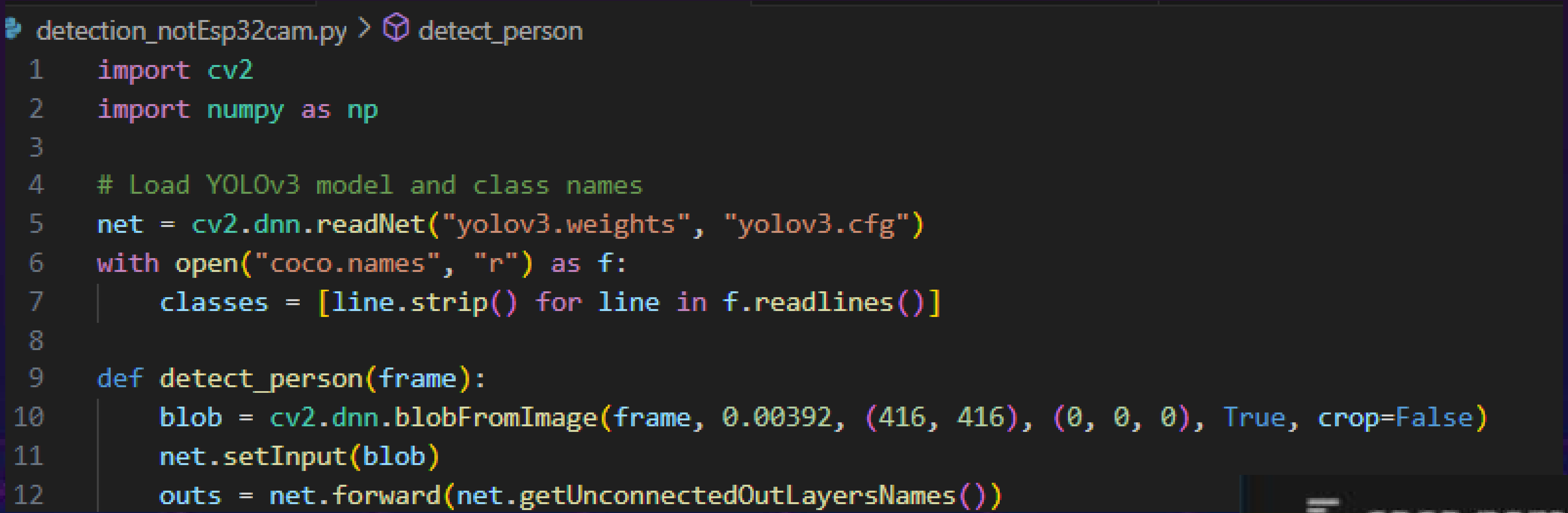
EXIT

การใช้ YOLOV3

0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ

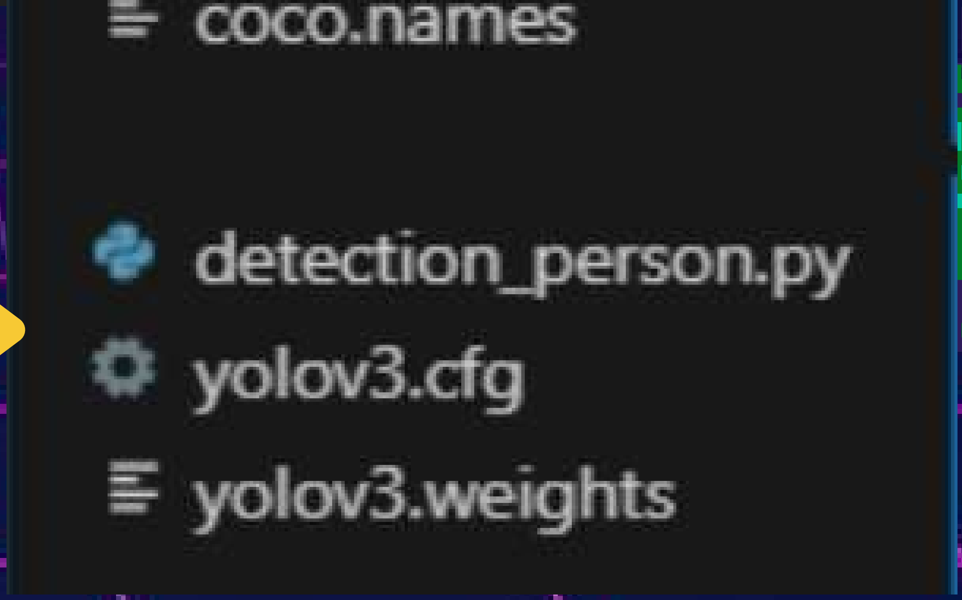
(CODE) Part 1



detection_notEsp32cam.py > detect_person

```
import cv2
import numpy as np

# Load YOLOv3 model and class names
net = cv2.dnn.readNet("yolov3.weights", "yolov3.cfg")
with open("coco.names", "r") as f:
    classes = [line.strip() for line in f.readlines()]

def detect_person(frame):
    blob = cv2.dnn.blobFromImage(frame, 0.00392, (416, 416), (0, 0, 0), True, crop=False)
    net.setInput(blob)
    outs = net.forward(net.getUnconnectedOutLayersNames())
```

ในที่นี้นำทุกไฟล์
ไว้ใน Floder เดียวกันนะครับ



coco.names
detection_person.py
yolov3.cfg
yolov3.weights

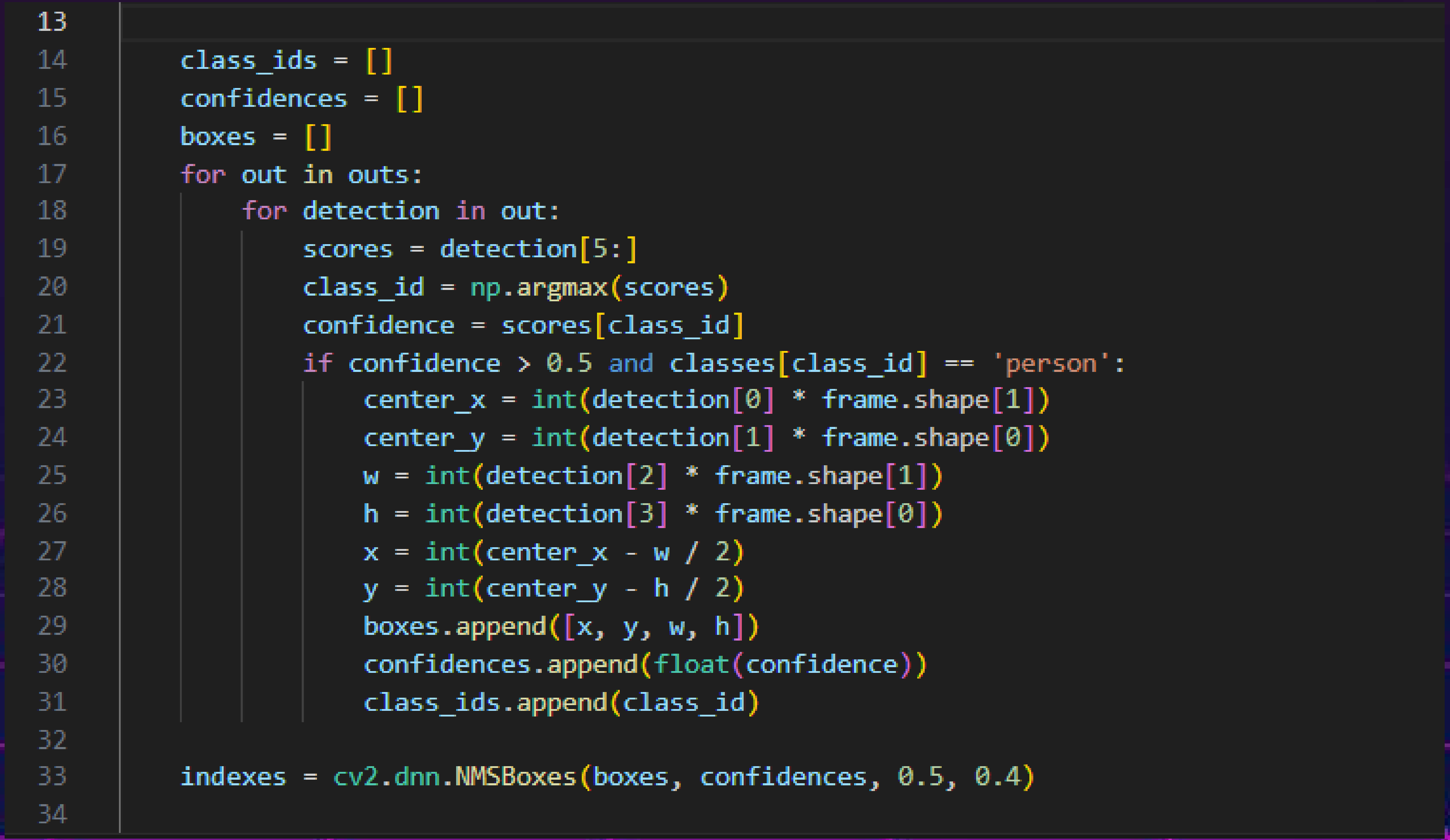
EXIT

การใช้ YOLOV3

(CODE) Part 2

0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ



```
    class_ids = []
    confidences = []
    boxes = []
    for out in outs:
        for detection in out:
            scores = detection[5:]
            class_id = np.argmax(scores)
            confidence = scores[class_id]
            if confidence > 0.5 and classes[class_id] == 'person':
                center_x = int(detection[0] * frame.shape[1])
                center_y = int(detection[1] * frame.shape[0])
                w = int(detection[2] * frame.shape[1])
                h = int(detection[3] * frame.shape[0])
                x = int(center_x - w / 2)
                y = int(center_y - h / 2)
                boxes.append([x, y, w, h])
                confidences.append(float(confidence))
                class_ids.append(class_id)

    indexes = cv2.dnn.NMSBoxes(boxes, confidences, 0.5, 0.4)
```

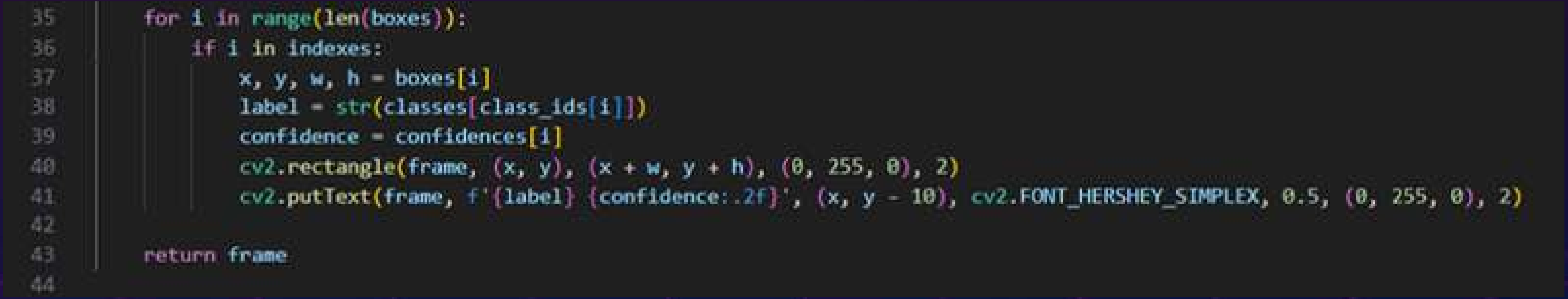
EXIT

การใช้ YOLOV3

0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ

(CODE) Part 3



```python
    for i in range(len(boxes)):
        if i in indexes:
            x, y, w, h = boxes[i]
            label = str(classes[class_ids[i]])
            confidence = confidences[i]
            cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 255, 0), 2)
            cv2.putText(frame, f'{label} {confidence:.2f}', (x, y - 10), cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0, 255, 0), 2)

    return frame
```

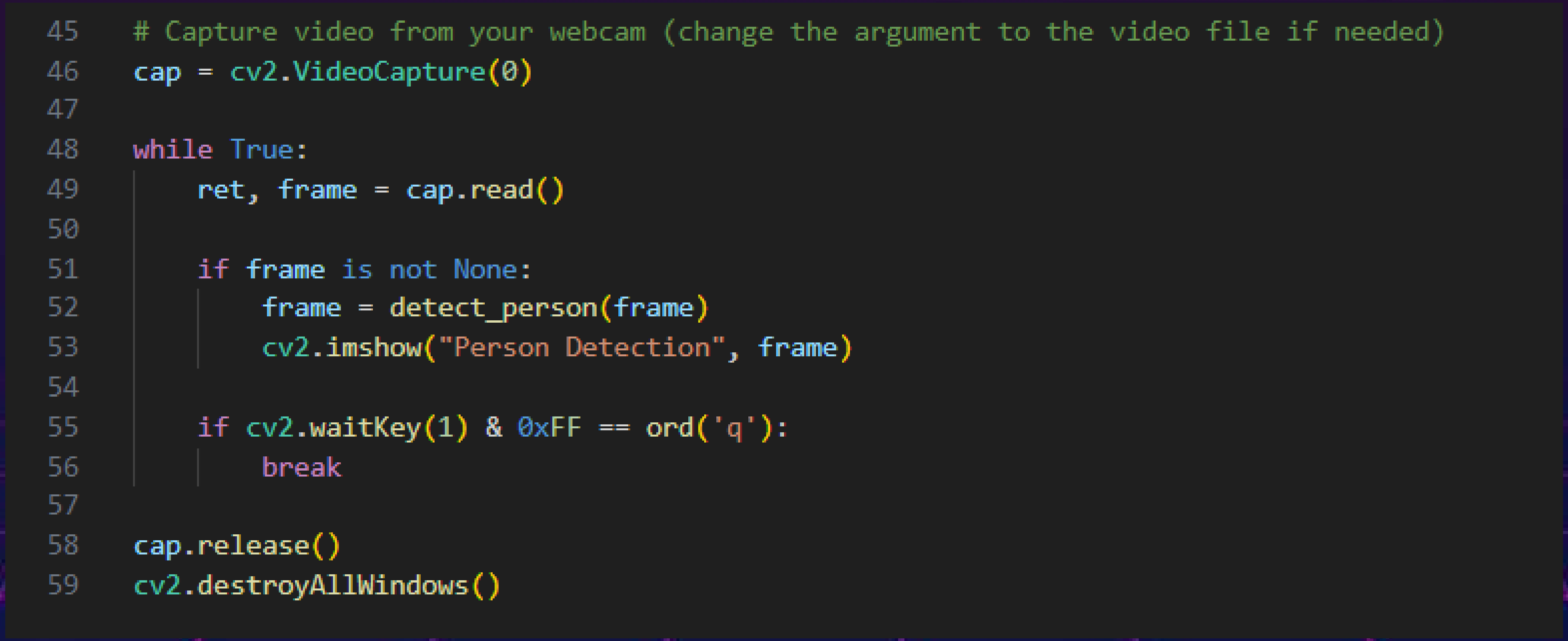
EXIT

การใช้ YOLOV3

0 - 1%

ไม่เหมือน ไปจนถึง ตรงเป๊ะ

(CODE) Part 4

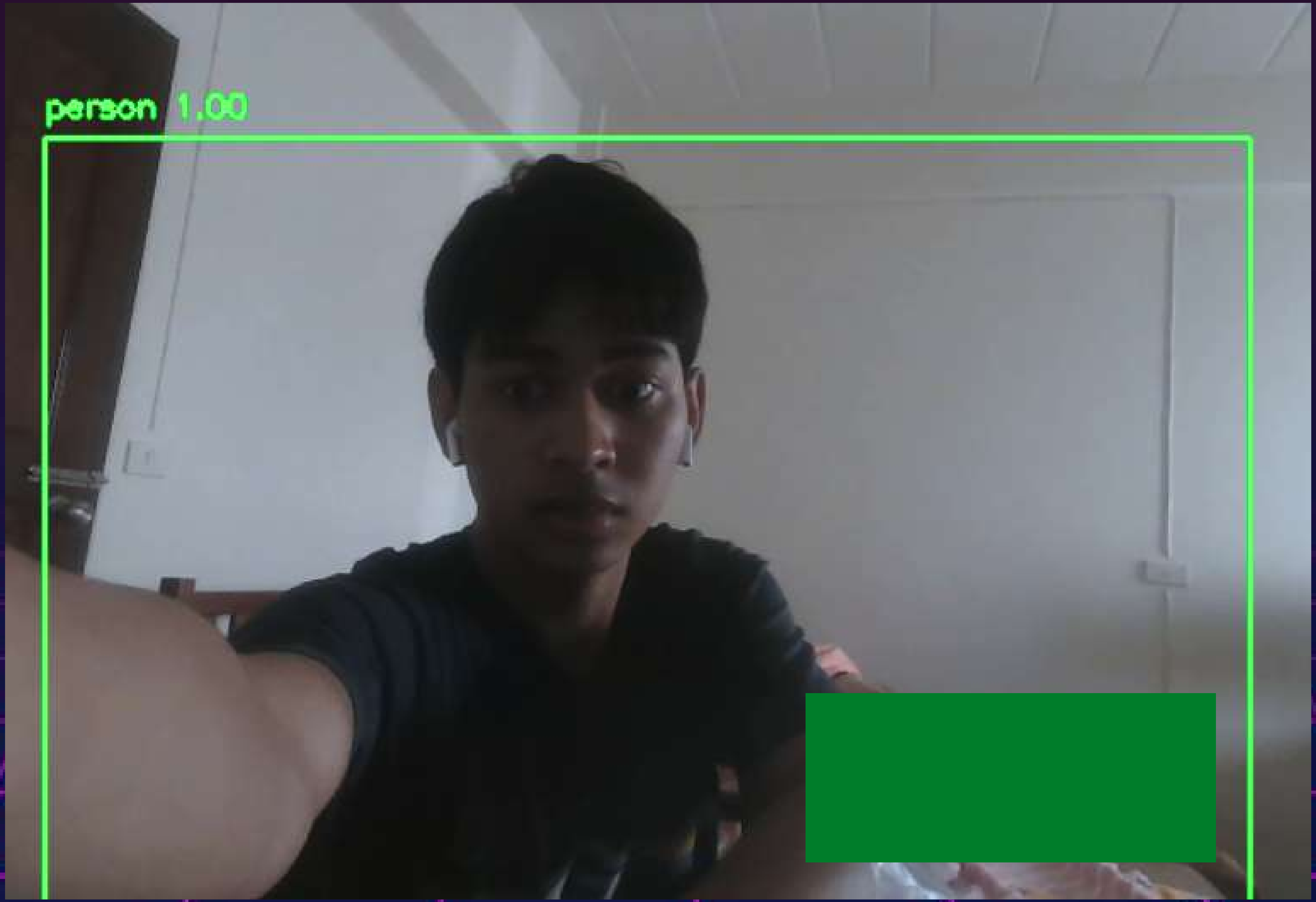


```python
# Capture video from your webcam (change the argument to the video file if needed)
cap = cv2.VideoCapture(0)

while True:
    ret, frame = cap.read()

    if frame is not None:
        frame = detect_person(frame)
        cv2.imshow("Person Detection", frame)

    if cv2.waitKey(1) & 0xFF == ord('q'):
        break

cap.release()
cv2.destroyAllWindows()
```

EXIT

การใช้ YOLOV3

เช็คผลลัพธ์
(Result)



EXIT

Thank You!

End of Session Image Processing