

DR. ALVIN'S PUBLICATIONS

# HOW TO PERFORM SIMPLE FACIAL RECOGNITION ON PHOTOS USING PYTHON

BY 'TECH WITH TIM'

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A SUMMARY BY DR. ALVIN ANG



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## STEP 1 – INSTALL PYTHON (64 BIT)

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THIS ARTICLE IS BASED ON THE WORK BY TIM (2019)<sup>1</sup>

Two ways to get Python 3.7.5 (**Must** be 64 bit):

1. From Dr. Alvin's Website

- Go to <http://www.alvinang.sg/publications-1>
- Scroll down the page all the way
- Under “Data Science / AI Work” section, you will see it.
- Download and install.

2. From Python's Website

- Go to <https://www.python.org/downloads/windows/>
- Scroll around and look for “Download Windows x86-64 executable installer”
- Or simply click the link below:
- <https://www.python.org/ftp/python/3.7.5/python-3.7.5-amd64.exe>
- Download and install.

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<sup>1</sup> <https://www.youtube.com/watch?v=D5xqcGk6LEc>

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## STEP 2: DOWNLOAD THE CODE

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- Facial Recognition Code Name = **face\_rec.zip**
- Two ways to get it:
  1. From Dr. Alvin's Website
    - Go to <http://www.alvinang.sg/publications-1>
    - Scroll down the page all the way
    - Under "Data Science / AI Work" section, you will see it.
    - Download and extract onto **Desktop**.
  2. From Tim's Website
    - Go to [https://techwithtim.net/face\\_rec/](https://techwithtim.net/face_rec/)
    - Download and extract onto **Desktop**.

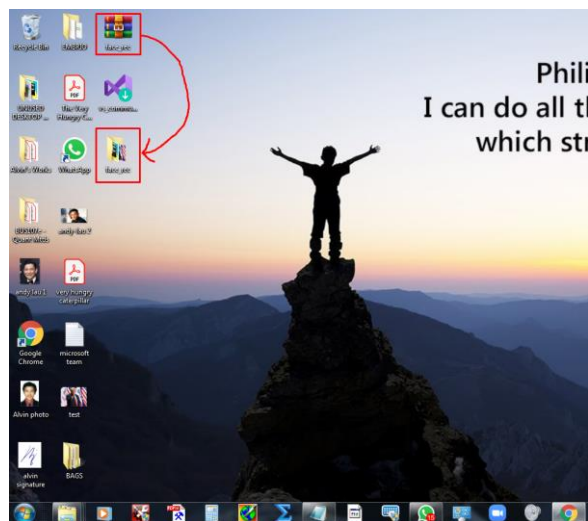


Figure 1: Download and Extract "face\_rec.zip" unto Desktop

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## STEP 3: DOWNLOAD AND INSTALL VISUAL STUDIO

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### DOWNLOAD MICROSOFT VISUAL STUDIO COMMUNITY EDITION (2019)

Two ways to get it:

1. From Dr. Alvin's Website

- Go to <http://www.alvinang.sg/publications-1>
- Scroll down the page all the way
- Under “Data Science / AI Work” section, you will see it.
- Download **but don't install yet**.

2. From Microsoft Visual Studio Download Page

- Go [https://visualstudio.microsoft.com/downloads/?utm\\_medium=microsoft&utm\\_source=docs.microsoft.com&utm\\_campaign=button+cta&utm\\_content=download+vs2019+rc](https://visualstudio.microsoft.com/downloads/?utm_medium=microsoft&utm_source=docs.microsoft.com&utm_campaign=button+cta&utm_content=download+vs2019+rc)
- Download **but don't install yet**.

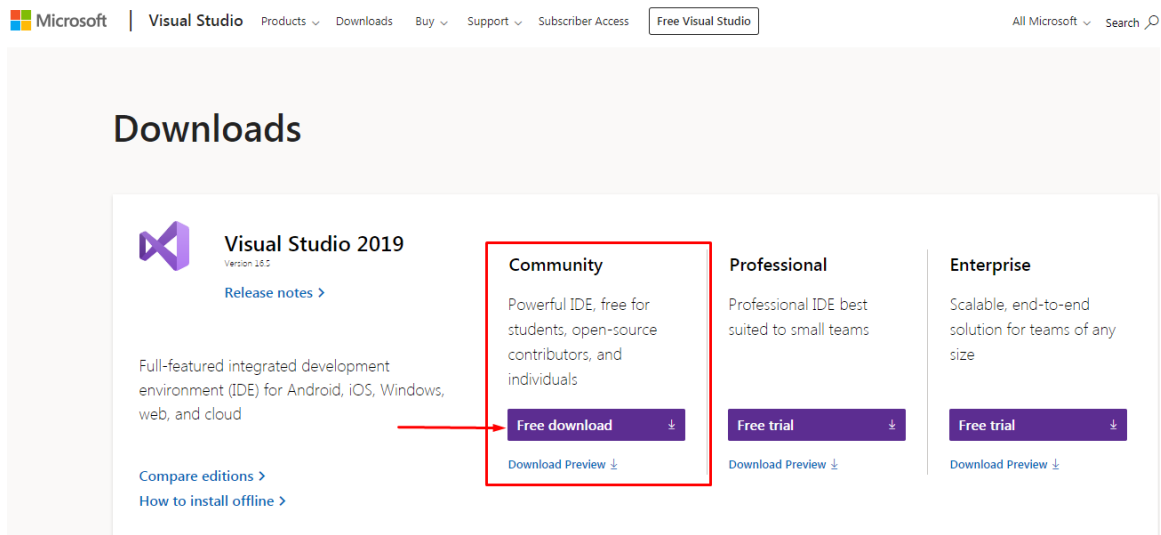


Figure 2: Download Microsoft Visual Studio Community Edition 2019

## INSTALL MICROSOFT VISUAL STUDIO COMMUNITY EDITION (2019)

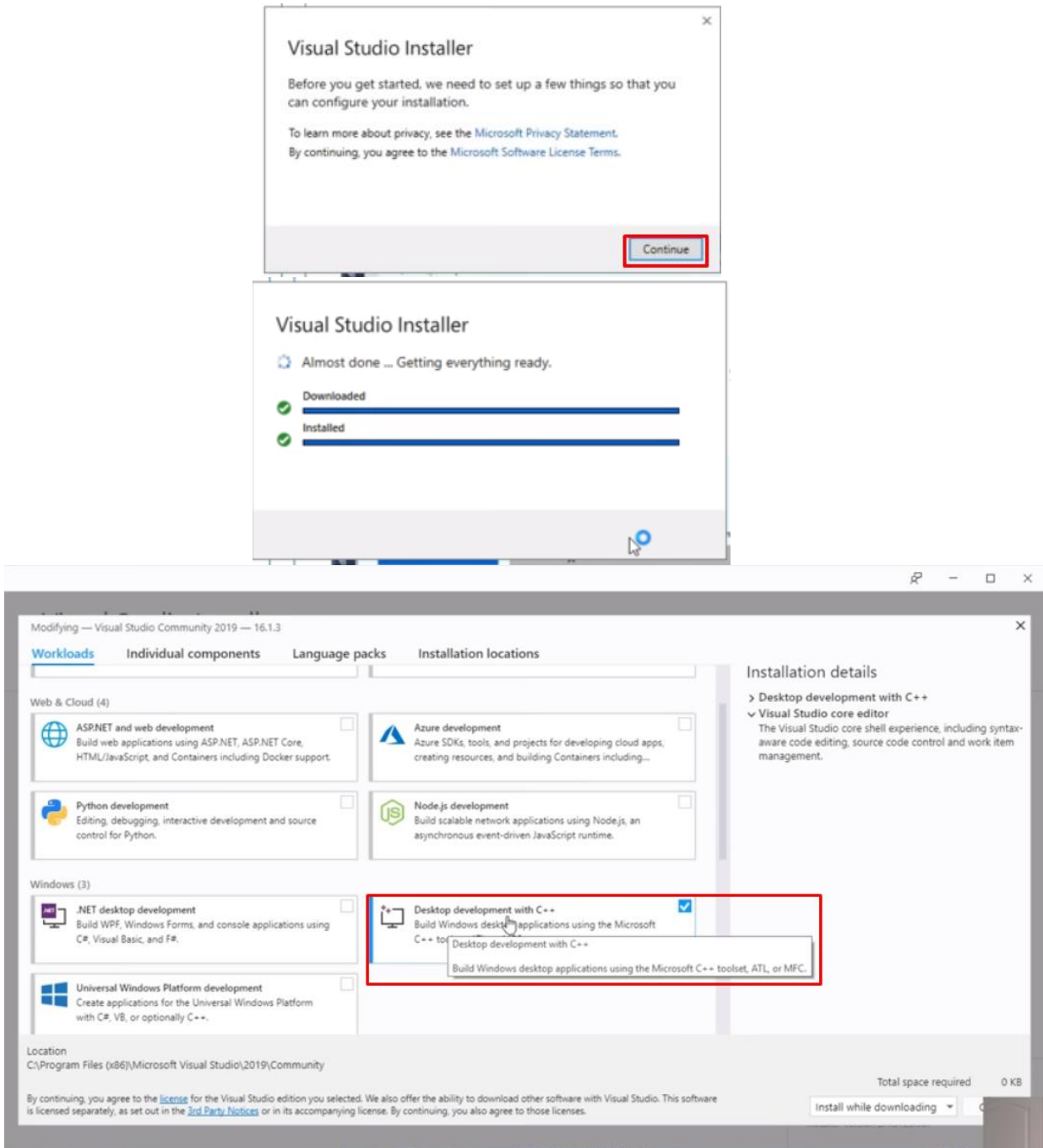


Figure 3: Select Desktop Development with C++

- Installation will take some time – then you will come to this page (Figure 3).

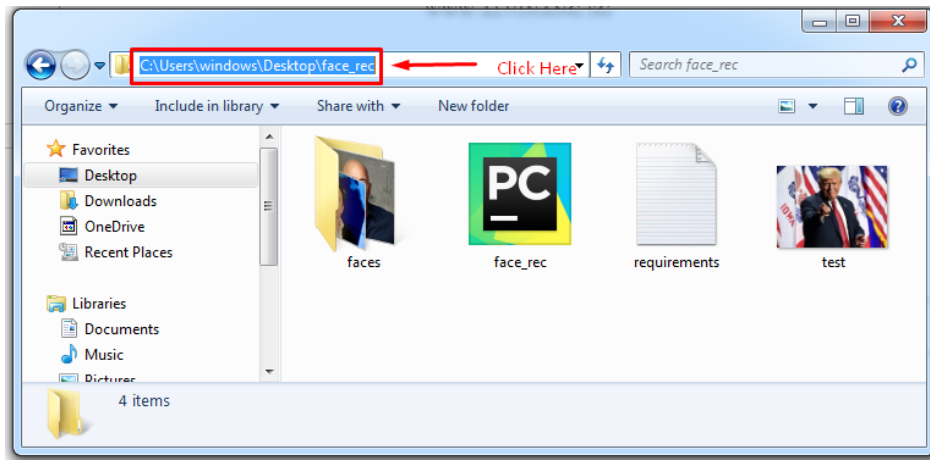
- Select Desktop Development with C++ → Then click **Install**
- It will take long! (6GB to install)
- Once done, **RESTART** your laptop



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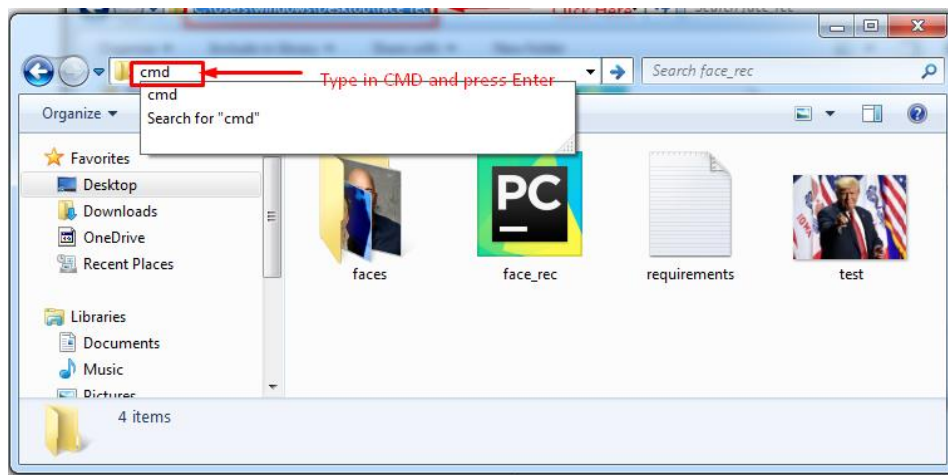
## STEP 4: RUN PIP INSTALL

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*Figure 4: Go to the folder where you have unzipped the face\_rec folder*

- After Restarting you laptop, go to the folder where you unzipped the 'face\_rec.zip' (Figure 4)
- Click on the top bar....



*Figure 5: Type in CMD and press Enter*

- Then retype "cmd"

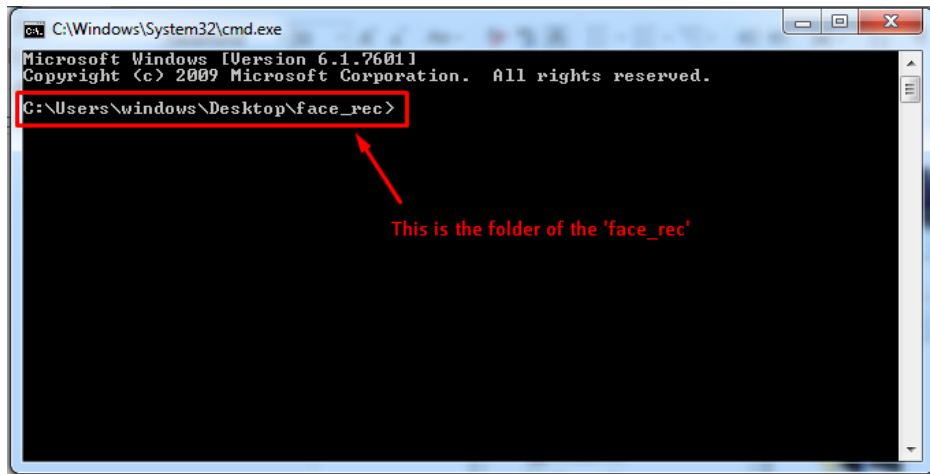


Figure 6: CMD prompt

- You will be brought to the C:\ command prompt – the folder of the ‘face\_rec’
- At this point, ensure that your Python version is 64 bit.

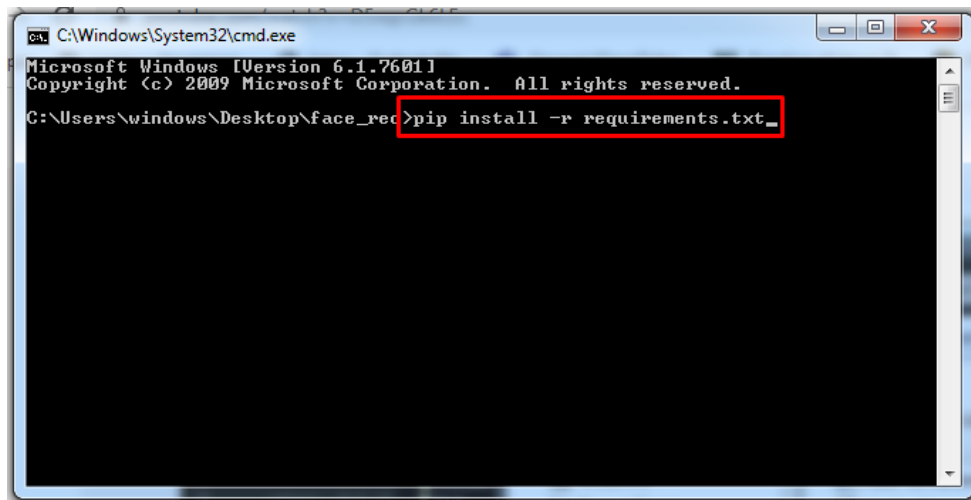


Figure 7: Type in the pip install command

- At the command prompt, type in “pip install -r requirement.txt”.
- If everything is smooth, you will see it installing
- But most probably you will run into a problem (see the next section).

## PROBLEMS WITH PIP INSTALL COMMAND

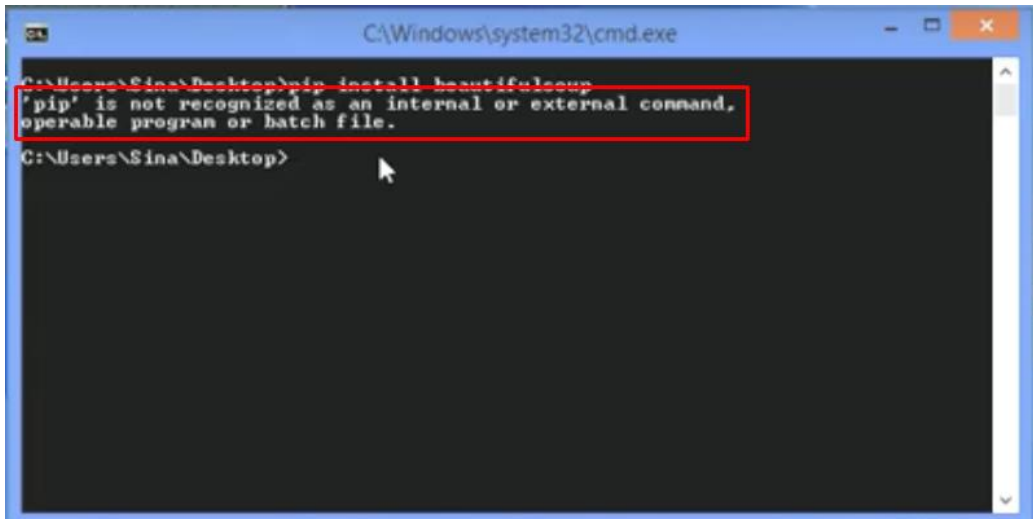


Figure 8: pip is not recognized

- After you try running 'pip install' command, most probably you will run into this problem
  - "pip is not recognized as an internal or external command, operable program or batch file"

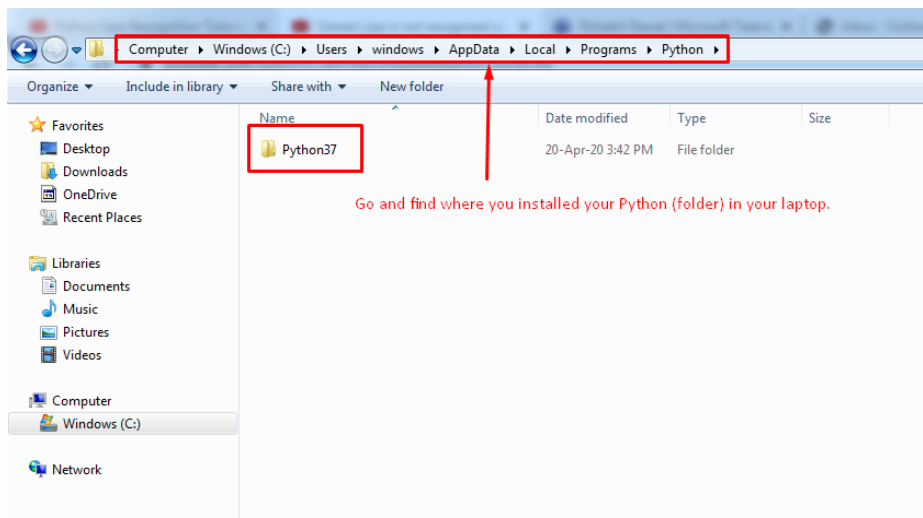


Figure 9: Where did you install your Python?

- Following Figure 9, go and find where you had previously installed your Python.

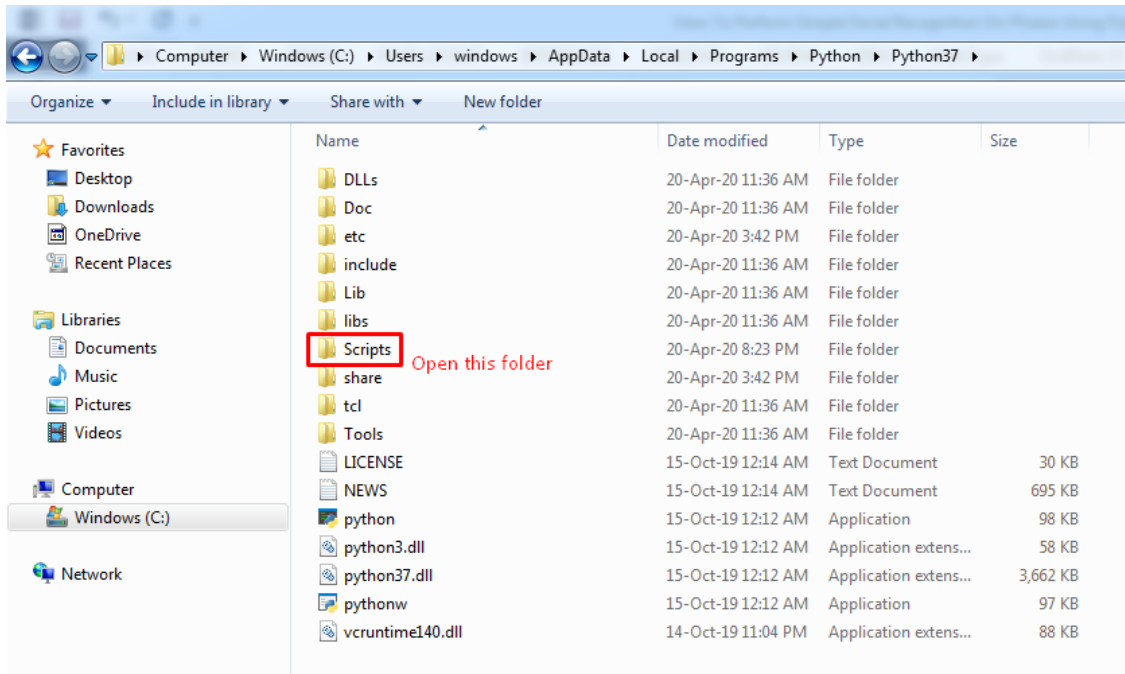


Figure 10: Double click and open the folder

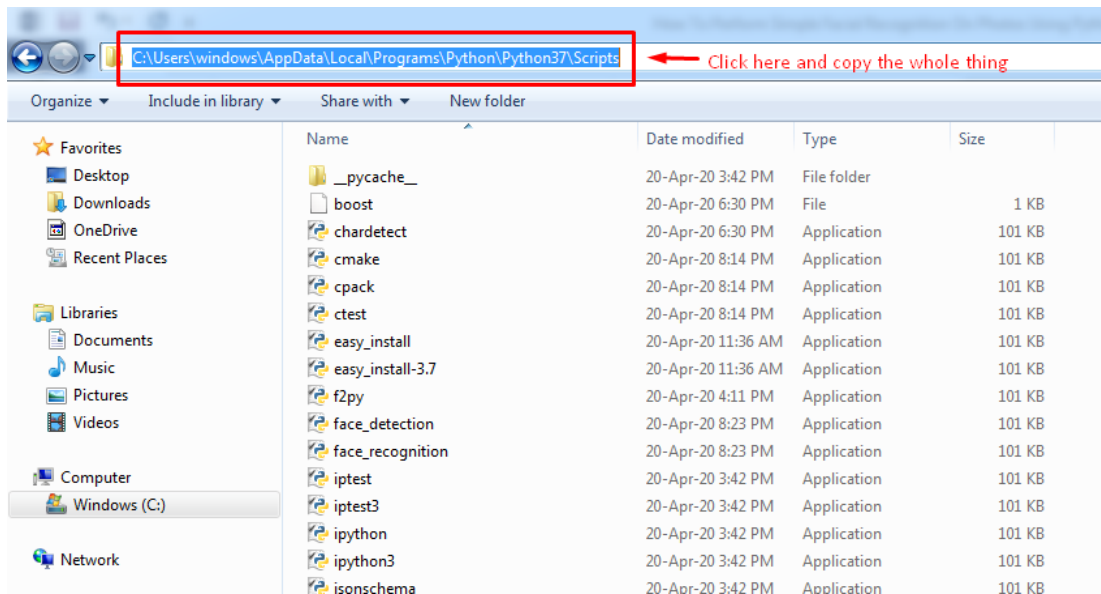


Figure 11: Click on the top bar and copy it (Ctrl +C)

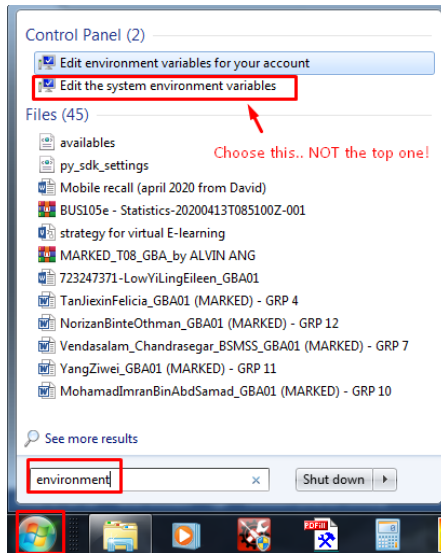


Figure 12: Go to start, type "environment"

- Go to start, type in 'environment' → At the top, the control panel will appear
- Choose "Edit the **SYSTEM** environment variables".

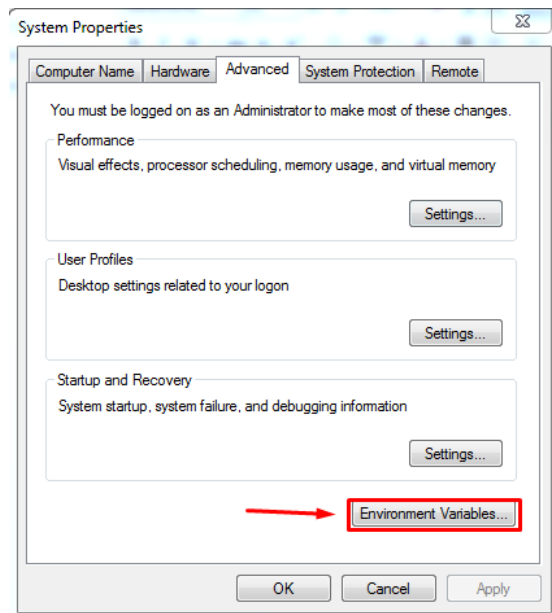


Figure 13: A System Properties will pop up - Click on Environment Variables

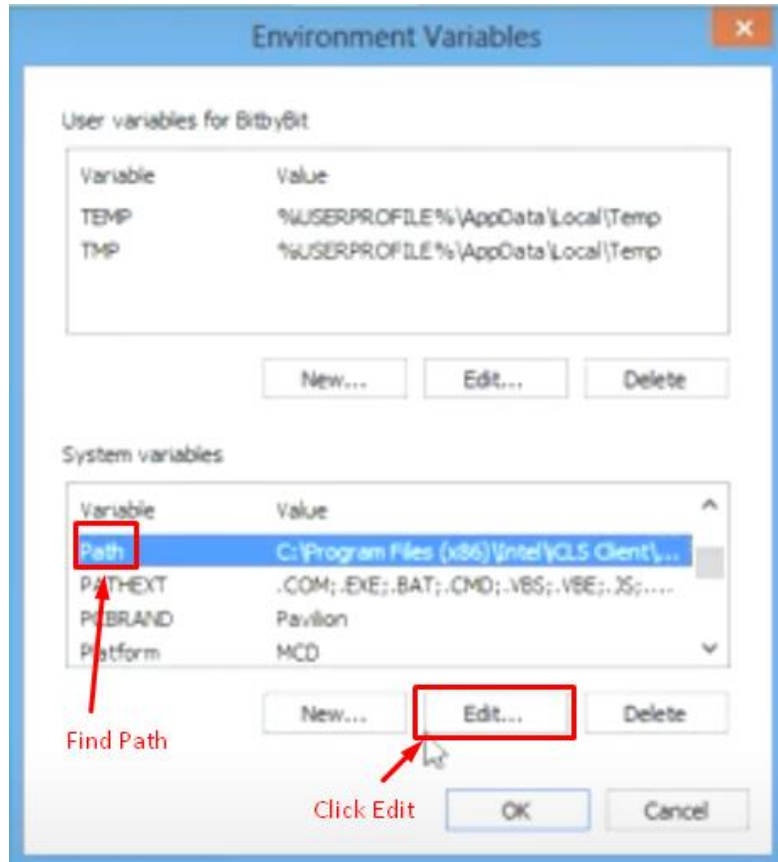


Figure 14: At the System Variables box, find the variable "Path", then click Edit

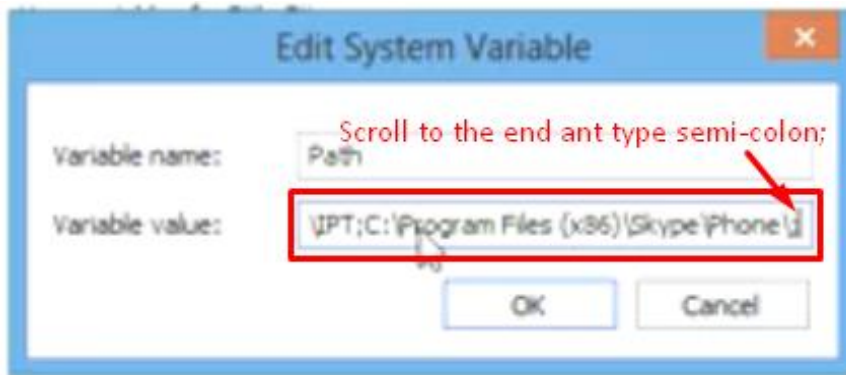


Figure 15: A pop up will appear, go to 'Variable Value' and scroll all the way to the END; then type in a semi-colon ;

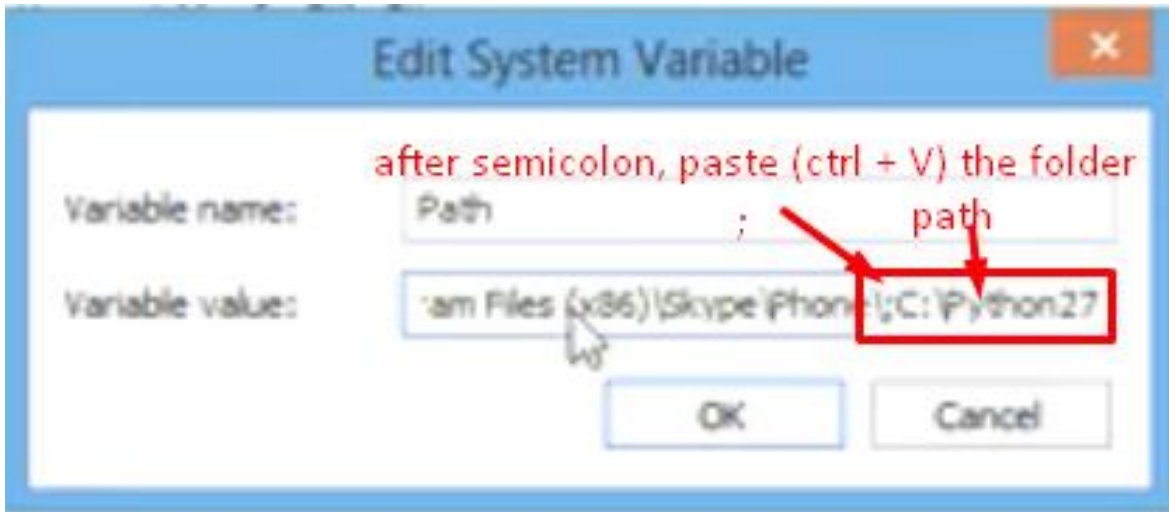


Figure 16: After semicolon, Ctrl + V to paste the Python's Script folder location

- After Figure 16, just keep clicking OK until all the 'Environment System Variables' close.

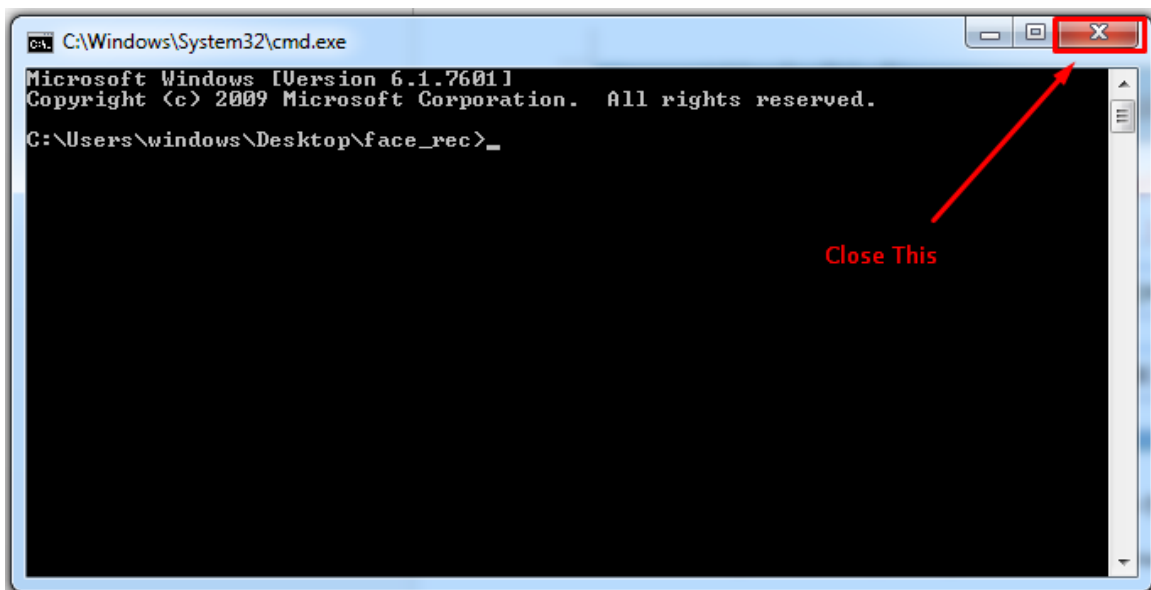


Figure 17: After System Variable has been added, close the current CMD prompt

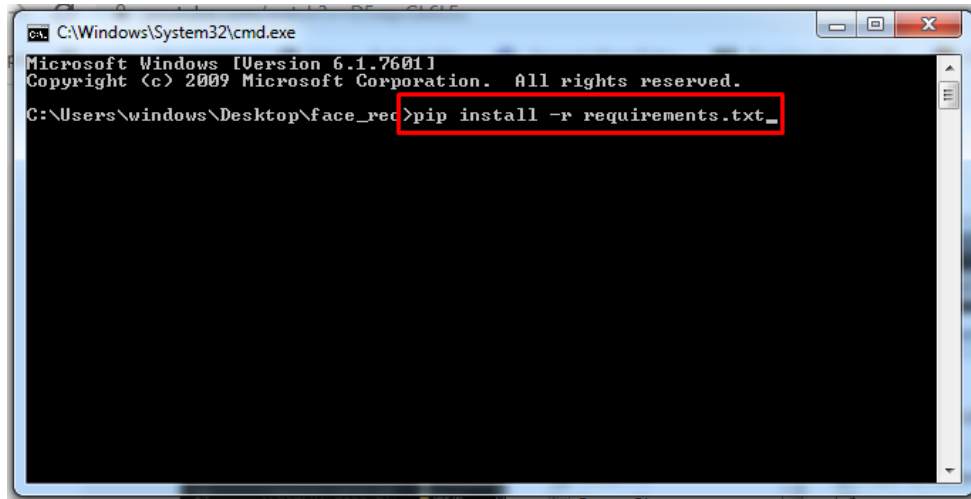


Figure 18: Type in the pip install command

- Go back to Figure 6 and re-open a new CMD prompt.
- At the command prompt, type in “pip install -r requirement.txt” (Figure 18).



Figure 19: Pip install... takes VERY long!

- Figure 19 shows the pip installing. Take note: it takes a very long time.
- Please do not close the Command Prompt while it is installing... just be patient.



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## STEP 5: RUN THE FACE RECOGNITION PROGRAM (THRU PYTHON)

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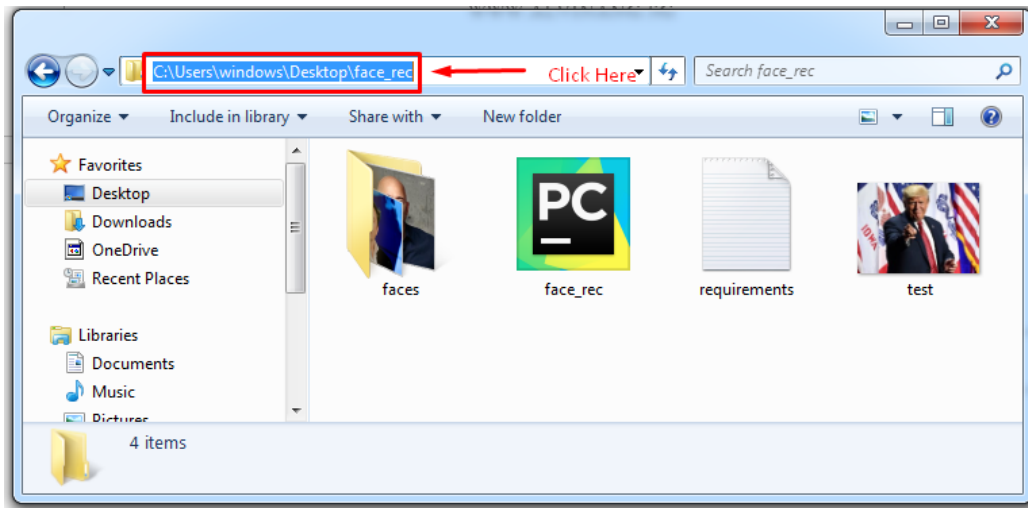


Figure 20: Go to the folder where you have unzipped the `face_rec` folder

- Go to the folder where you unzipped the 'face\_rec.zip' (Figure 20)
- Click on the top bar....

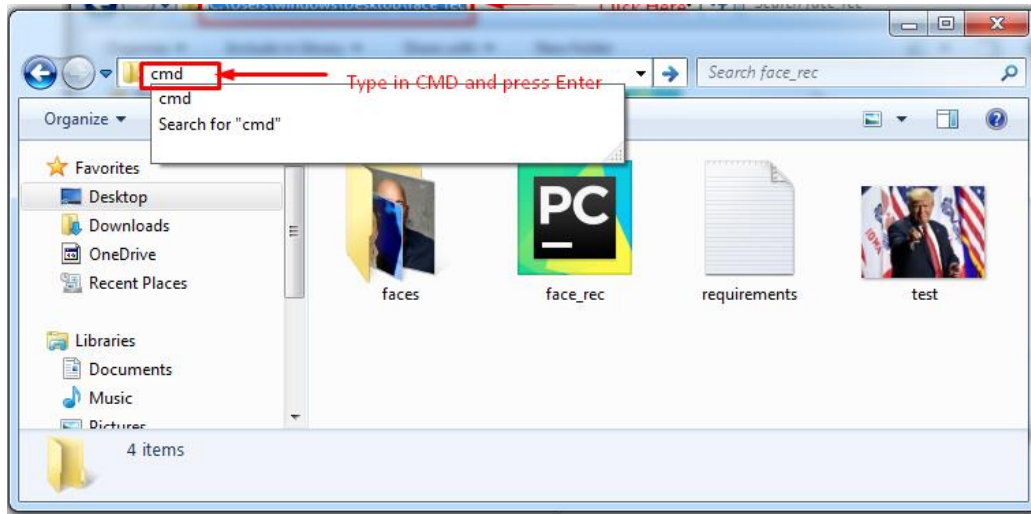


Figure 21: Type in CMD and press Enter

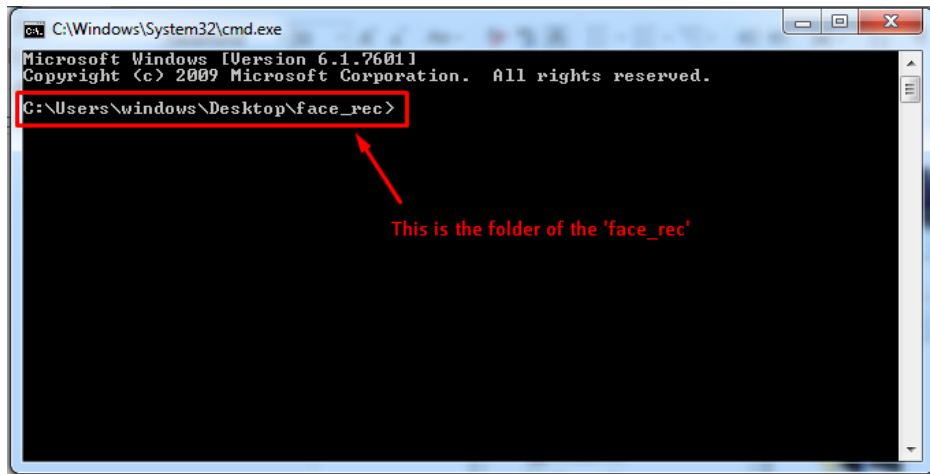


Figure 22: CMD prompt

- You will be brought to the C:\ command prompt – the folder of the ‘face\_rec’

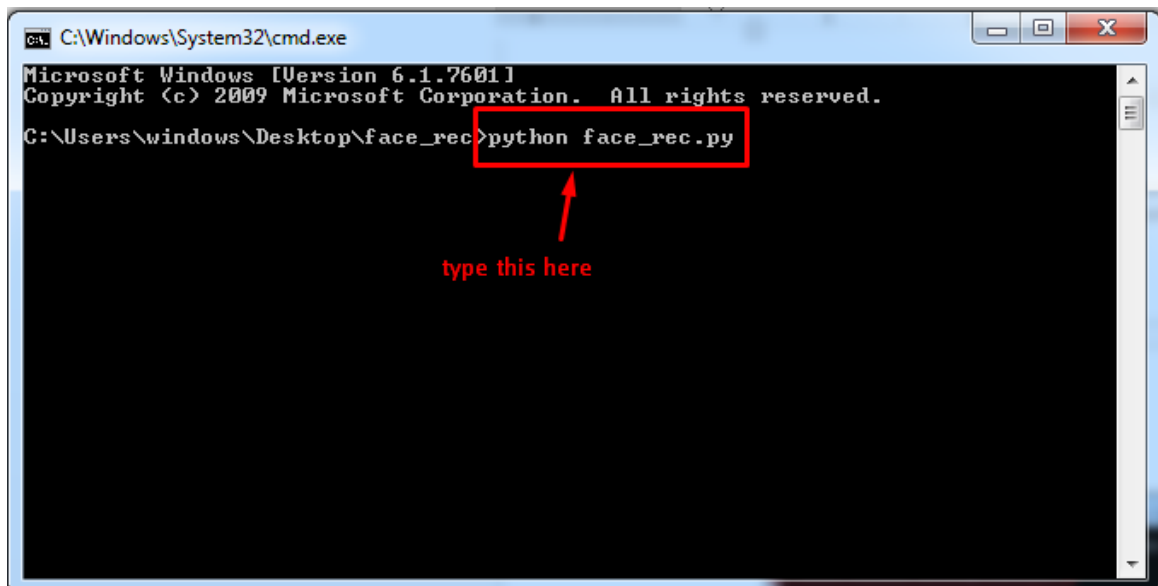
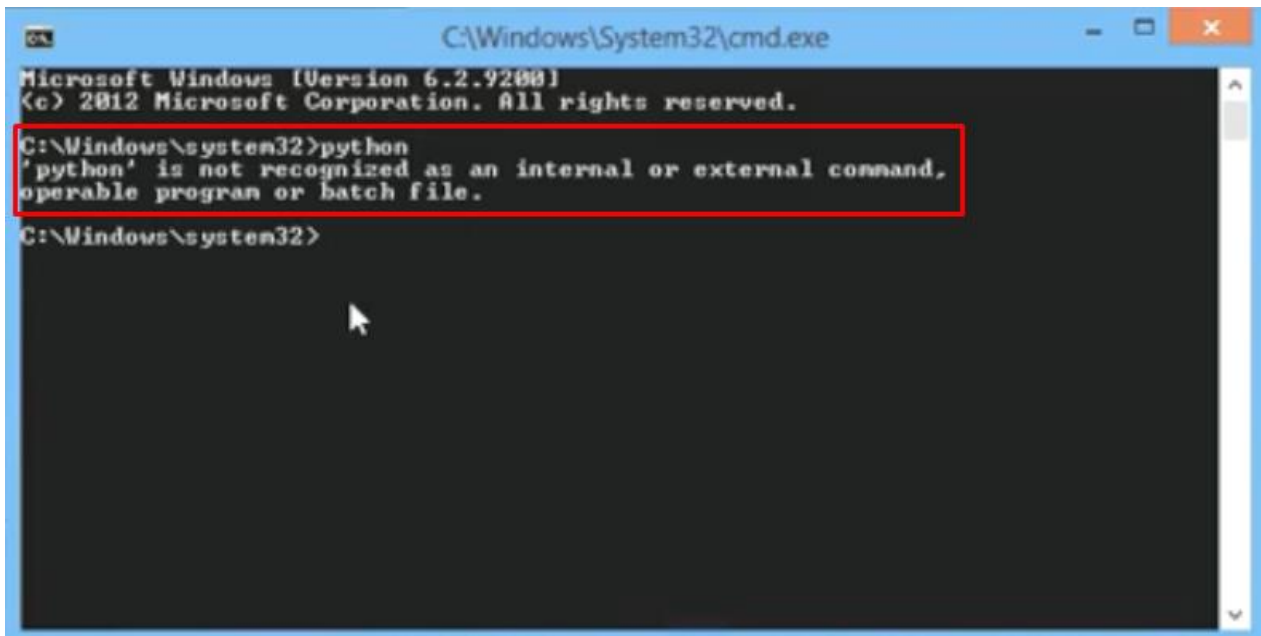


Figure 23: Type in 'python face\_rec.py'

- Type in ‘python face\_rec.py’
- If you are lucky, the program runs well.
- Else, you will face another problem (See next section)

## PROBLEM RUNNING PYTHON AT CMD PROMPT



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Windows\system32>python
'python' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows\system32>
```

Figure 24: Problem running Python at CMD Prompt

- If you can't run Python at the Command Prompt, kindly refer to the section (much earlier) on "Problems with Pip Install Command" on Page 11 → Just follow the same steps.
- **BUT**, do not double click the 'Scripts' folder (do NOT open it) → Figure 25

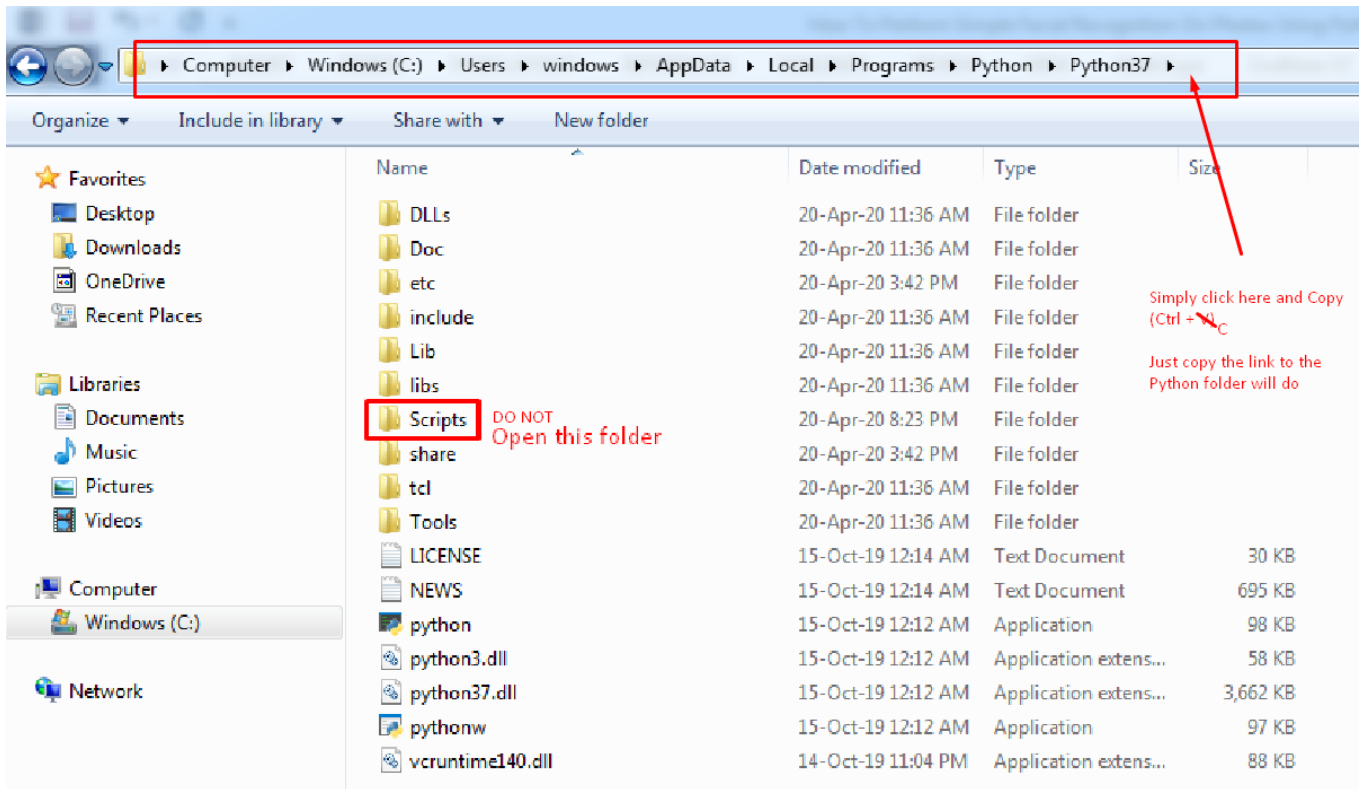


Figure 25: Do **NOT** Double click and open the folder

- Simply click on the top bar and just copy it (just copy the direct Python folder will do).
- Subsequently, follow the steps in Figure 12 (Page 13)

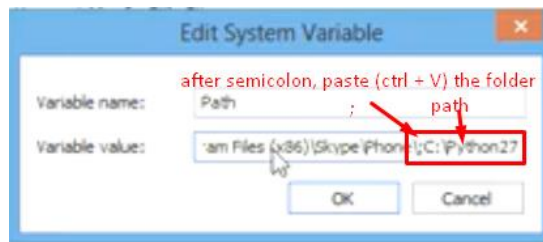
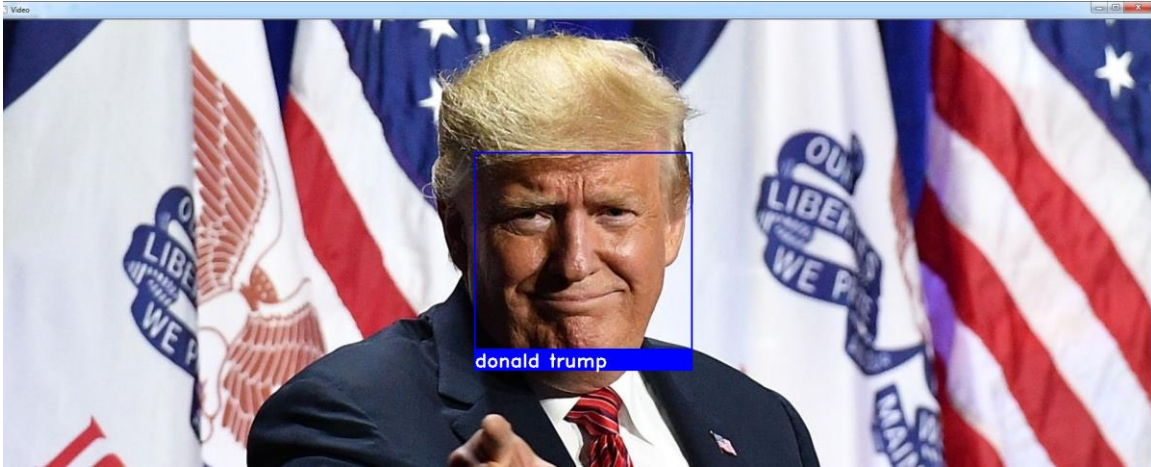


Figure 26: After semicolon, Ctrl + V to paste the Python's Script folder location

- After Figure 26, just keep clicking OK until all the 'Environment System Variables' close.
- Go back to Figure 23 and run the program.



*Figure 27: Final Output*

- If all goes well, Figure 27 is what you will see → a blue box around the face with the name.

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STEP 6: HOW TO USE THE PROGRAM

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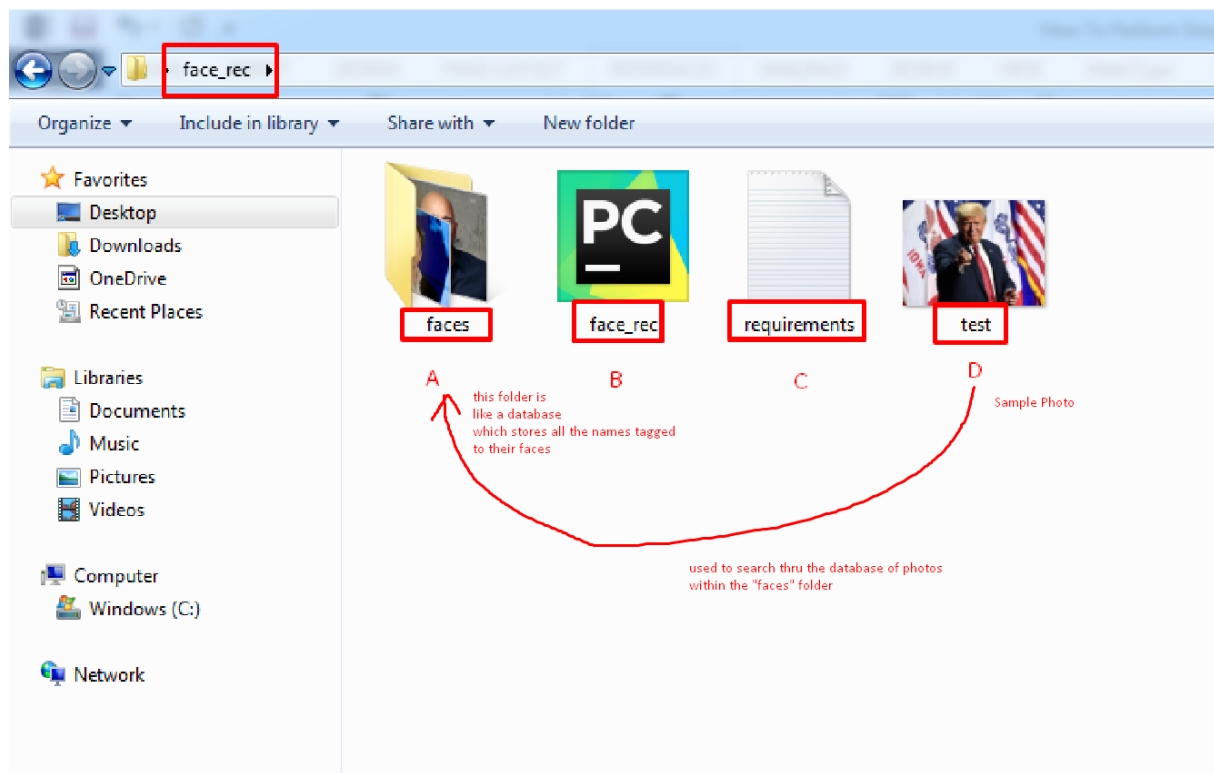


Figure 28: 4 Items in the 'face\_rec' Folder

#### A. FACES FOLDER = DATABASE OF PHOTOS WITH NAMES

- Referring to Figure 28, the ‘faces’ folder, if we open it up, this is what we see.

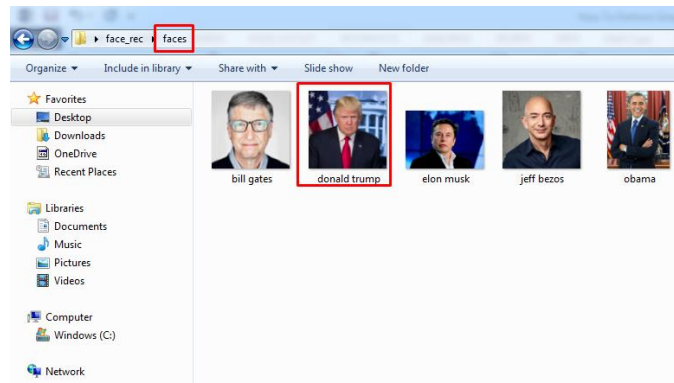


Figure 29: Inside the 'faces' folder

- You can see that the ‘test’ photo in Figure 28 is Donald Trump.
- In other words, the purpose of the ‘faces’ folder (Figure 29) is a **Storage Place** where the program can use it to search for all the relevant face and photos.

#### B. FACE\_REC = THE PYTHON PROGRAM

- The “face\_rec.py” is the Python program which we use to run (thru the command prompt)

#### C. REQUIREMENTS = NEEDED FOR PYTHON TO RUN

- Recall section “Step 4: Run PIP Install” on page 9.
- This “requirements.txt” file is used to notify which “C++ packages” are required to be installed into Python before it can run.

#### D. TEST = SAMPLE PHOTO WITHOUT NAME

- This is the **Sample Photo** which you use to search through the “faces” folder for the name.
- In other words, presume you have a photo but you don’t know the name of the face.

- Replace “test” with your new photo and rename it “test”.
- If the person’s photo is inside the “faces” folder with his name, it will retrieve and display his name on your “test” photo for you.



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## REFERENCES

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Tim, T. W. (2019). "Python Face Recognition Tutorial w/ Code Download." from <https://www.youtube.com/watch?v=D5xqcGk6LEc>.

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## ABOUT THE AUTHORS

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Tim is a first year computer science student that has a passion for programming and everything tech! Teaching and writing guides is his favorite past-time. More about him at <https://techwithtim.net/>

Dr. Alvin Ang earned his Ph.D., Masters and Bachelor degrees from NTU, Singapore. He is a scientist, entrepreneur, as well as a personal/business advisor. More about him at [www.AlvinAng.sg](http://www.AlvinAng.sg).