1- Instructions for setting Raspberry Pi 3B+

1. Download the latest Raspbian image from this link: https://www.raspberrypi.org/downloads/raspbian/.
2. Download win32diskimager (https://sourceforge.net/projects/win32diskimager/) to copy image to SD card. Once the image is installed in SD card then eject the SD card. Insert again the SD card and a pop-up will ask you to format the SD card but just cancel that option.
3. Then open **Rpi_files** folder.
4. Edit the wpa_supplicant.conf file. You have to enter your Wi-Fi name and password.
5. Also go to this link (https://www.raspberrypi.org/documentation/configuration/wireless/wireless-cli.md) and modify the file according to your Wi-Fi settings. i.e. whether you have a hidden network, network with no password or normal open network with password. The given file is set for normal wifi network with password. After changings being done. Copy paste the two files (ssh and wpa_supplicant.conf) into the SD card in which the image was installed. Then insert the SD card into Raspberry Pi. Wait for few minutes.
6. In meanwhile install https://angryip.org/download/#windows. Using angryIP scanner scan for devices connected to that Wi-Fi.
7. You'll see raspberry Pi also given an IP Address. Note it down for future use. Now your Raspberry Pi 3 B+ is connected to Wi-Fi.
8. Install putty. https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html
9. Then type the raspberry pi IP address and make sure that ssh is selected.
10. Now click “Open” to initiate the connection.
11. On the first connection attempt, a security warning will appear. Just press “Yes”since you’re
    connecting to your own Pi.
12. If the SSH connection is successful you’ll be greeted with the login prompt of your Raspberry Pi.
    If this is your first login and you haven’t changed the username or password yet, enter **pi** for the
    username, and **raspberry** as the password.
13. Enter **sudo raspi-config** at the command prompt to access it. Then select “Interfacing Options”
    from the menu:
14. Thenselect“VNC”,to enableVNC:
15. Now reboot the Pi with **sudo reboot**.
16. Next, we need to install RealVNC Viewer on the computer you want to access the Pi from.
    Download RealVNC Viewer and open the .exe file.
    https://www.realvnc.com/en/connect/download/viewer/
17. IP address of your Pi, enter it into the address bar at the top of the window.
18. Then your Rpi desktop will open on your laptop.

2- Installing Dependencies and Libraries

19. Access the command window terminal and start doing other installations on Rpi.
20. Type **python** to check which version is installed already of python.
26. sudo apt-get install python-opencv
27. do camera installation
28. sudo raspi-config > Interfacing > Enable camera
29. Considering that you have Python and OpenCV installed in Rpi. Further to successfully run the Face recognition code, you need to install **dlib**, **face_recognition** and **imutils** libraries. You can use following commands in Rpi terminal,
pip install dlib
Note: If you face problem in installing dlib in Rpi then you can visit this link for help: https://www.pyimagesearch.com/2017/05/01/install-dlib-raspberry-pi/
pip install face_recognition
pip install imutils

3- Setting Face Recognition Setup in Raspberry Pi

1- There are 2 options, for downloading your required code setup folder into raspberry pi
   1) Directly downloading the "foundean" zip folder by going to this link: https://github.com/techynina/founddean
   2) Running following command in RaspberryPi terminal:
   git clone https://github.com/techynina/founddean.git
2- Directly unzip the folder or use following command
unzip founddean.zip
3- You'll see a folder with name **dataset** within **founddean** folder.
Within **dataset** folder, there should be separate folders for each new face recognition. Folder name should be name of the person, you want to recognize during video streaming. For time being I have set name of persons to be **person_one** and **person_two**. Adding more, given name of folder should be in small letters with no space in words. There should be at least 6 to 7 images of each face with different poses e.g. near and far view of face. Name the images within each folder as 0001,0002,…. Etc. Change numbering style for each folder e.g. 00001, 00002,… etc.
4- After addition of every new image, you have to **run encode_faces.py** code. Run the following command in terminal to do so.
python encode_faces.py --dataset dataset --encodings encodings.pickle \--detection-method hog
5- After that run final code of **foundean.py** by running this command
python founddean.py --cascade haarcascade_frontalface_default.xml \--encodings encodings.pickle
After running the above command, video streaming will start and face detection system will be working in background.
6- To quit the video streaming. Press **'q'**.