# Raspberry pi

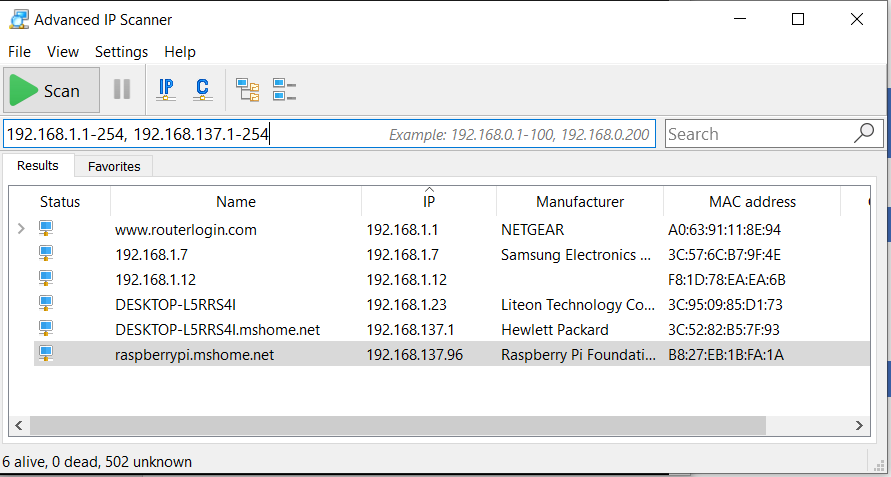
# Format booted raspberry pi SD card

* Download SD Format software and format SD card

# Install Rasbian OS to raspberry pi

* Download latest rasbian os (current - NOOBS)
* Extract zip file
* Copy to SD card
* Boot SD in raspberry pi

# Connect raspberry pi to laptop screen

* Internet and sharing center
* Change adapter option
* Wifi – right click – properties
* Sharing
* Check – allow other network users to connect this pc
* Ok
* Now the wifi status changes to shared
* In pc
* Open cmd
* Ipconfig
* Note down ipv4 address of LAN WIFI: (192.168.1.23)
* Download ipscan software
* <https://www.advanced-ip-scanner.com/>
* 
* Download putty
* <https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>
* Open putty
* Paste raspberry pi ip into puttys hhost name field
* If connection refuse error occur [goto](#_Putty_connection_refuse)
* Username:pi
* Password: raspberry

# Connect raspberry pi to VNC

* Raspberry pi >
* Preference >
* Raspberry pi configuration >
* Interface >
* Enable VNC
* Not working …

## 2nd method

* Connect putty to raspberry pi
* sudo apt-get update
* sudo apt-get install tightvncserver
* set the password for vnc server
* tightvncserver
* enter password
* New 'X' desktop is raspberrypi:1
* vncserver :1 -geometry 1024x768
* A VNC server is already running as :1
* That’s all for raspberry pi
* Open vnc in Computer
* Type ip - 192.168.43.116:1 and password

# Putty connection refuse error

<https://www.avoiderrors.com/connection-refused-raspberry-pi-4/>

# Basic commands

## Shutdown

* sudo shutdown -h now

# 4\*4 LED display

## Opencv installation in raspberry pi

[LearnOpencv](https://www.learnopencv.com/install-opencv-4-on-raspberry-pi/)

## Object detection raspberry pi lite

[Youtube video](https://www.youtube.com/watch?v=aimSGOAUI8Y)

## Run python when reboot

[Youtube](https://www.youtube.com/watch?v=BJbKvEWZXak)

[Website](https://www.pyimagesearch.com/2016/05/16/running-a-python-opencv-script-on-reboot/)

* systemctl status myProg
* sudo systemctl start myProg

## Object tracking yolo

[Github](https://github.com/nathanrooy/rpi-urban-mobility-tracker)

## Number plate detection

Code [Web](https://iotdesignpro.com/projects/real-time-license-plate-recognition-using-raspberry-pi-and-python)

import cv2

import imutils

import numpy as np

import pytesseract

from PIL import Image

from picamera.array import PiRGBArray

from picamera import PiCamera

# import smtplib

# server=smtplib.SMTP('smtp.gmail.com',587)

# server.starttls()

# server.login("abhijithm2447@gmail.com", "initial#024")

camera = PiCamera()

camera.resolution = (640, 480)

camera.framerate = 30

rawCapture = PiRGBArray(camera, size=(640, 480))

for frame in camera.capture\_continuous(rawCapture, format="bgr", use\_video\_port=True):

        image = frame.array

        cv2.imshow("Frame", image)

        key = cv2.waitKey(1) & 0xFF

        rawCapture.truncate(0)

        if key == ord("s"):

             gray = cv2.cvtColor(image, cv2.COLOR\_BGR2GRAY) #convert to grey scale

             gray = cv2.bilateralFilter(gray, 11, 17, 17) #Blur to reduce noise

             edged = cv2.Canny(gray, 30, 200) #Perform Edge detection

             cnts = cv2.findContours(edged.copy(), cv2.RETR\_TREE,              cv2.CHAIN\_APPROX\_SIMPLE)

             cnts = imutils.grab\_contours(cnts)

             cnts = sorted(cnts, key = cv2.contourArea, reverse = True)[:10]

             screenCnt = None

             for c in cnts:

                peri = cv2.arcLength(c, True)

                approx = cv2.approxPolyDP(c, 0.018 \* peri, True)

                if len(approx) == 4:

                  screenCnt = approx

                  break

             if screenCnt is None:

               detected = 0

               print ("No contour detected")

             else:

               detected = 1

             if detected == 1:

               cv2.drawContours(image, [screenCnt], -1, (0, 255, 0), 3)

             mask = np.zeros(gray.shape,np.uint8)

             new\_image = cv2.drawContours(mask,[screenCnt],0,255,-1,)

             new\_image = cv2.bitwise\_and(image,image,mask=mask)

             (x, y) = np.where(mask == 255)

             (topx, topy) = (np.min(x), np.min(y))

             (bottomx, bottomy) = (np.max(x), np.max(y))

             Cropped = gray[topx:bottomx+1, topy:bottomy+1]

             text = pytesseract.image\_to\_string(Cropped, config='--psm 11')

             print("Detected Number is:",text)

            #  server.sendmail("sushant.singh7685@gmail.com","sushant.singh7685@gmail.com",text)

             cv2.imshow("Frame", image)

             cv2.imshow('Cropped',Cropped)

             cv2.waitKey(0)

             break

cv2.destroyAllWindows()