

Direct Storage Detection of a USB in R-PI

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Abstract:

The implemented project will help us to solve many daily life problems and also help us save time. Our project basically detects the storage of a pen drive by using a Raspberry pi. When we attach a pen drive to our device it reads the memory that's empty and shows the same through LED's, if the pen drive is empty then all the 4 Led's will be lit while if the storage is half full only 2 LED's will be lit. This idea came to me because of the daily life struggles that we have during our casual works like coping movies, saving files, downloading games and all the other works that we do in our daily life. So, we thought of bringing up a solution wherein you would not require to check the storage after putting up the USB drive in the PC instead it will directly show it. I want to implement this in all the USB and pen drives of the world so that everyone can save their time and also can do their work efficiently and completely

Keywords —Raspberry PI, Raspian OS, USB, Storage, LED

I. INTRODUCTION

This project is a Linux based project which helps in detecting the storage of a pen drive or a USB drive if it is connected to our device through LED's i.e. if the usb is empty all the LED's are lit while if 50% or more but less than 75% is empty then 2 LED's will be lit.

This project will be helpful a lot to all those who own more than one pen drive and have to work on it on daily basis, it will help them save a lot of time also work more efficiently and faster. It uses a Raspberry pi B+ as it's the most efficient of all other models.

We have written our code in Python 3.0. We are using 3-volt GPIO pins to give power to the LED's to be lit. We have used a total of 4 LED's one can use more or less, more the number of Led's more efficiently the storage is detected. Our storage is divided into 4 parts because $100/4=25\%$.

Each LED increases with 25% of storage that is empty. (1 led =25% 2 led =50% 3 led =75per- cent and 4 led=100%)

II. RASPBERRY PI

A. FUNDAMENTALS OF RASPBERRY PI (B+)

1. family of single board computers (SBC)
2. 64-bit quad core processor
3. running at 1.4GHz
4. built-in metal heatsink
5. dual-band 2.4GHz
6. 5GHz wireless LAN
7. faster (300 mbps) Ethernet
8. PoE capability via a separate PoE HAT
9. Credit card sized computer[4]

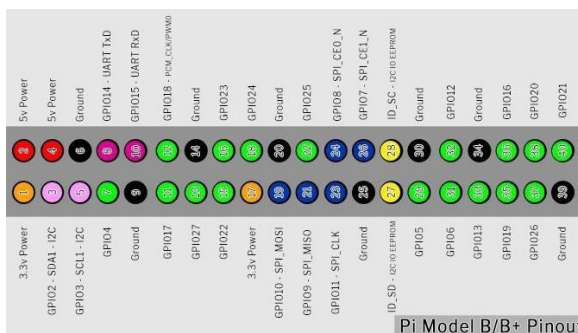


Fig 1 : Structure of Raspberry Pi

B. PARTS OF RASPBERRY PI

- **GPIO** :read and give electrical signals
- **DSI Display Port** : connect to a serial display similar to those used in tablets
- **MicroSD Slot**: It doesn't come with the pi it's used to put the operating system in the same e.g.: Raspbian
- **CSI Camera Port**: Is used to connect to raspberry pi camera module
- **HDMI / USB / Network**: connect the Pi to an HDMI screen e.g. :keyboard ,mouse Ethernet
- etc.
- **Micro USB Power**: used to give power to the Raspberry pi

C. GPIO PINS

GPIO pins full form is general purpose input output. In this modal of raspberry pi, we have a total of 40 pins. `GPIO.setmode(GPIO.BCM)`.

`GPIO.setmode(GPIO.BOARD)` It includes a row of GPIO pins along the edge of the board that provide the interface between the Raspberry Pi and other components. These pins act as switches that output 3.3 volts when set to HIGH and no voltage when set to LOW. You can connect a device to specific GPIO pins and control it with a software program. For example :you can put one end of the wire to GPIO pin and other to Ground pin.[3]

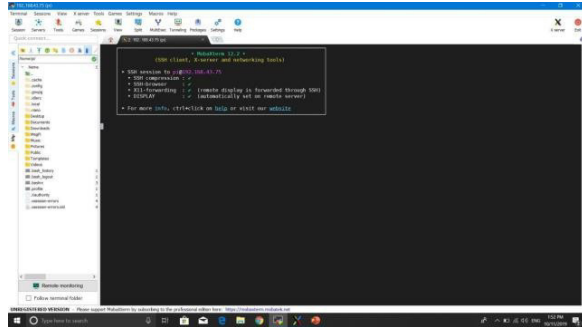


Fig -2: Mobaxterm Main screen

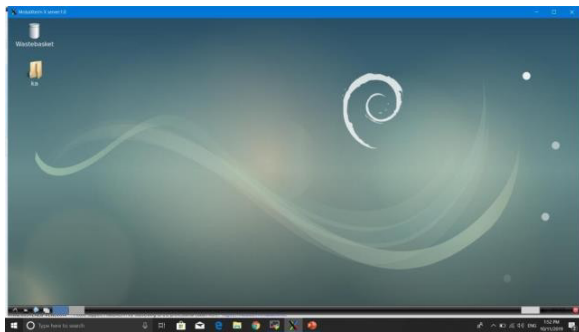


Fig -3: Raspberry PI main Screen

III.SOFTWARES IMPLEMENTED

Raspbian os (operating system): new• Free operating system based on Debian optimized for the Raspberry Pi hardware. An operating system is the set of basic programs and utilities that make your Raspberry Pi run

Advanced IP scanner

: free network scanner to analyze LAN. The program shows all network devices, gives you access to shared folders, provides remote control of computers (via RDP and Radmin), and can even remotely switch computers off. It is easy to use and runs as a portable edition. **Mobaxterm:**

For direct connection of Raspberry pi to the laptop.

IV. IMPLEMENTATION

Materials that have been used include breadboard ,Led' s, Raspberry Pi, female-female wires ,male female wires , USB cable, SD card pre-installed with Raspbian os or any other operating system.

Firstly, you have to install the Raspbian os inside the SD card then we had to setup the same. To have direct access to the raspberry pi without connecting it to the HDMI cable we had installed 2 software's .Advanced IP scanner it scans all the nearby devices and gives us help to get connected to the same. The second application that we installed includes MOBXTerm it is used to give the devices a medium through which it can display itself temporarily on the screen

We have inserted the IP address of the Raspberry Pi in the MOBXTerm so that it can have its own screen on the MOBXTerm application. Then as explained Raspberry pi is itself a computer , created its desktop and we then added our code to it. Through Python 3.0 we were able to execute the same and also instruct the Raspberry Pi

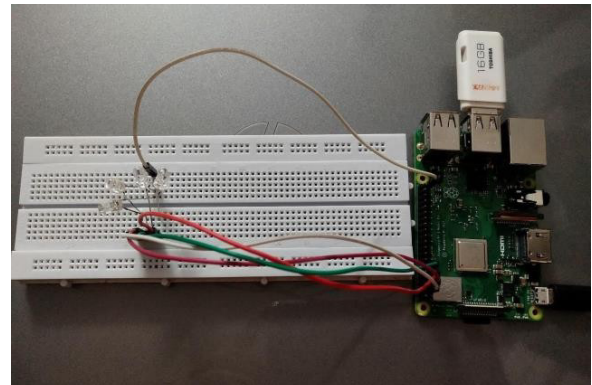


Fig -4 : Connections

V. CONNECTIONS

The connections include pins numbered 3,11,5 ,7 connected to the 4 LED's differently ,these pins give 3.3 volt- age to the positive end while the other leg of the LED is connected to pin number 39 which is ground . The data cable is used to provide power to the raspberry pi which indirectly provide power to the GPIO pins We have writ- ten our code in Python 3.0 .We will be using 3 volt GPIO pins to give power to the LED's to be lit.I have used a total of 4 LED's one can use more or less ,more the number of Led's more efficiently the storage is detected. Our storage is divided into 4 parts because $100/4=25\%$ age. When the code is compiled executed it checks the name of the hardware attached(pen drive) then it reads the storage and displays it through led's according to the approximate storage left inside.

VI. CONSTRAINS

The constrains of our projects include:

1. Expensive
2. Large in size
3. Exact storage cannot be

THE RASPBERRY PI:

- memory of raspberry pi is limited
- It cannot keep up with the modern software's
- You cannot photograph with a flash
- Lack of 1 GIGABIT ethernet port
- 100MBPS ethernet only

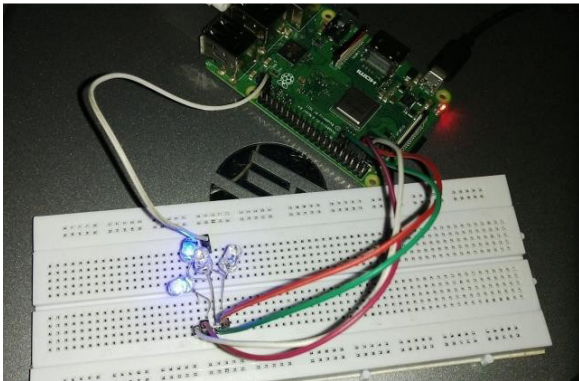


Fig 5: Output

VII. ADVANTAGES

- Shows storage efficiently
- Easy to use
- Saves time
- Easy to assemble
- One time investment
- Revolutionary
- Compact

VIII. FUTURE SCOPE

The advancements that will follow are :

- I. Make the storage to be shown on the screen rather than the LED's
- II. Make it less Expensive
- III. More Efficient
- IV. Smaller or compact in size
- V. Simultaneous storage detection of more than one pen drive

IF THE DEVICES USED BECOME COMPACT AND LESS EXPENSIVE IT COULD SAVE A LOT OF TIME AND ALSO BECOME THE STANDARD DESIGN OF THE PENDRIVE.

After the application is deployed, we shall introduce it in the market.



Fig 5 : Final product

V. Conclusion

The device is revolutionary saving time and increasing the efficiency , this system can be implemented in many more storage related devices to see their storage on the top. This device if brought to this world will be very beneficial to everyone and also will make our work faster and efficient.

REFERENCES

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