COVID DISINFECTANT TUNNEL USING FACEMASK DETECTION & TEMPERATURE MONITORING

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Abstract- **The coronavirus has been increasing across the world.It is important to take some precautions at each and every palce.Mainly in public places as the people presence is in majority.As we know it is hard to check out each and every person and monitor them manually.So we led us to bring this project into presence.In this project firstly it detects whether the person wears facemask or not using webcamera and then detects the temperature using MLX90614 IR temperature sensor.Here the tunnel allows only if the person is detected by facemask and then the temperature of a person should be normal.And finally it sprays the sanitization for the whole body.This project mainly helps in decreasing the manual presence to detect facemasks.It ensures each and every person to stay safe and should follow the rules and regulations given by the government.**

Keywords: Raspberry pi,web camera,IR sensor,Water sensor, MLX90614 IR temperature sensor.

Introduction:

Mainly this project domain is based on Embedded system.An embedded system is one kind of a computer system mainly designed to perform several tasks like to access,process,and store and also control the data in various electronics-based systems.Embedded systems are a combination of both hardware and software .Where software is usually known as firmware that is embedded into the hardware.One of its most important characteristics of these systems is, it gives the output within the time limits.Embedded system support to make the work more perfect and convenient.So,we frequently use embedded systems in simple and complex devices too.The applications of embedded systems mainly involve in our real life for several devices like microwave,calculators ,TV remote control,home security and neighbourhood traffic control systems,etc.

The disinfection and sanitization tunnel is a demonstration of how it has been designed to provide maximum protection to people passing through the tunnel in around 15 seconds.Which can help the community to fight against the covid-19.The main idea is to make a tunnel that can try and prevent the spread of covid-19.This disinfection and sanitization tunnel is prepared in order to sanitize people within 15 seconds from any possible bacteria.The disinfectant solution used consists of a combination of sodium hypochlorite(Naocl) and water (H20).The disinfectant is non-volatile,thus enabling prolonged veridical and bactericidal activity and sanitizing the surfaces.So,I took this initiative to make this smart disinfection and sanitization tunnel.This tunnel was made in a time span of 12hrs.It can disinfect a person fully from head to toe in a time span of just 15 seconds and the solution used is completely harmless.

Proposed System

Here we proposed a new system in simple way to detect facemask, temperature and to get sanitized. if the person doesn't wear mask it says" please wear mask" and then temperature should be normal.

Block Diagram:
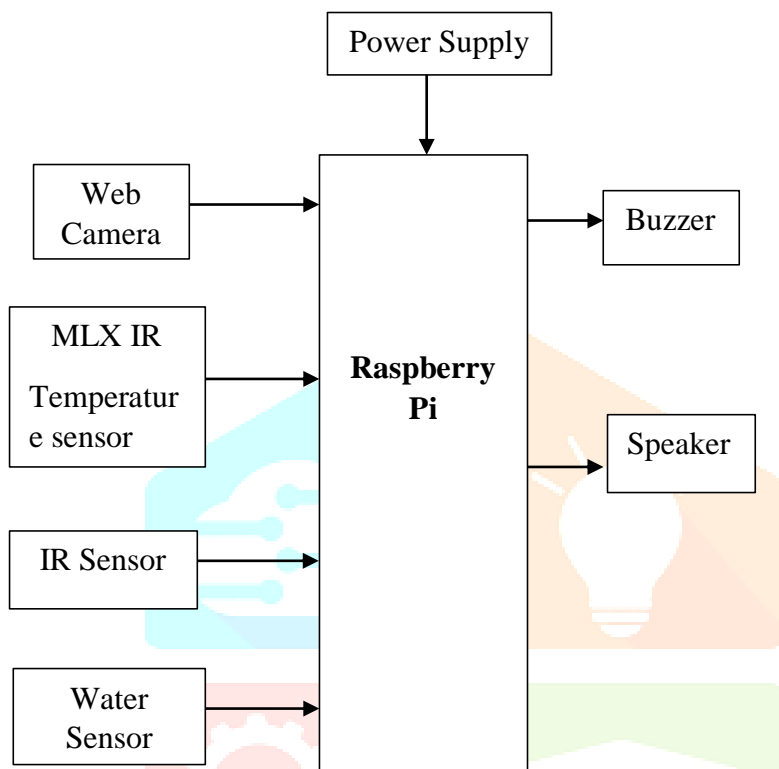
Hardware Requirements:

- Raspberry pi
- Web camera
- MLX90614 IR temperature sensor
- IR sensor
- Water sensor
- power Supply
- Buzzer
- Speaker

Embedded system Hardware

Introduction:

As with any electronic system, an embedded system requires a hardware platform on which it performs the operation embedded system hardware is built with a microprocessor or micro controller. The embedded system hardware has elements like input output interfaces, user interfaces, and the display usually an embedded system consists of

- Power supply
- Processor
- Memory
- Timers
- Serial communication ports
- Output/input circuits

Fig: Overview of embedded system
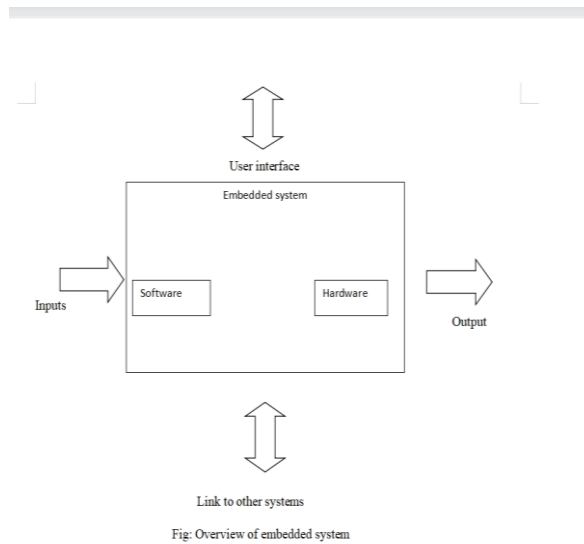
Software Requirements:

- NOOBS software
- VNC viewer
- Python3 IDE

NOOBS software installation:

NOOBS has plenty of operating systems for us to choose from when we reach that step-the most notable of which is Raspbian.For now,though let's concentrate on how to install NOOBS on the Raspberry pi.We will briefly discuss the operating system installations later,in our final step.

The optional easy route buy a NOOBS SD card

Installing NOOBS on an SD card isn't hard, but it also isn't necessary. If you'd like ,you can choose to buy an SD card that comes pre-loaded with NOOBS. If you go that route, you can skip all the way to the final step! You're going to use your computer to put NOOBS on an SD card –so step one is to get NOOBS onto your computer.

Step 1:Download NOOBS and extract it
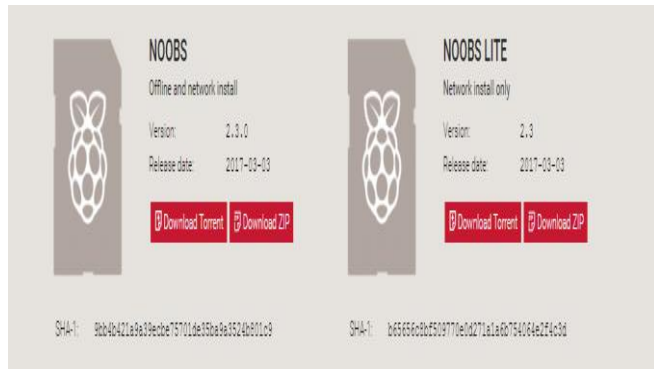
- Go to the NOOBS download page will let you choose between **NOOBS** and "**NOOBS lite**".NOOBS includes a full version of Raspbian,so you can install that particular operating system without using the internet at all with NOOBS Lite,

- Go ahead and choose whichever version you would like NOOBS will download as a zip file, so before you do anything else, go ahead and extract it.

Step 2:Format an SD card

Now you're going to want to go ahead and stick your SD card into the corresponding slot on your computer .You're going to want to format it as FAT. There are a few ways to do this. On Mac or windows, use the SD Association's Formatting Tool, Make sure the "Format size adjustment" option is set to "on". Then erase it in FAT.
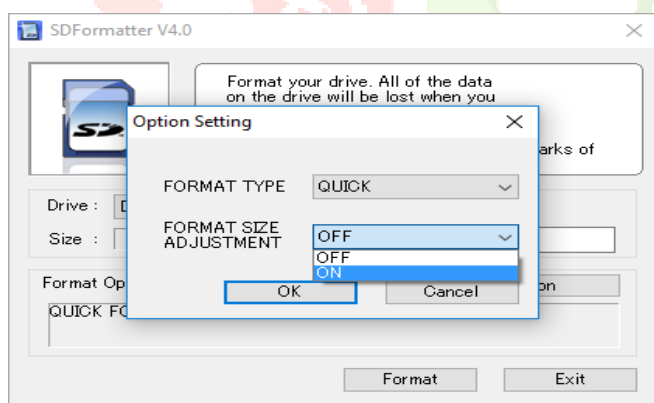
Step 3:Put the NOOBS files on the SD card

Now, just drag and drop the NOOBS files into your newly formatted SD card. You want the files only, so if your zip extracted to a folder, open that folder up and select only the stuff inside it .

Step 4:Put your SD card into your Raspberry pi and boot it up
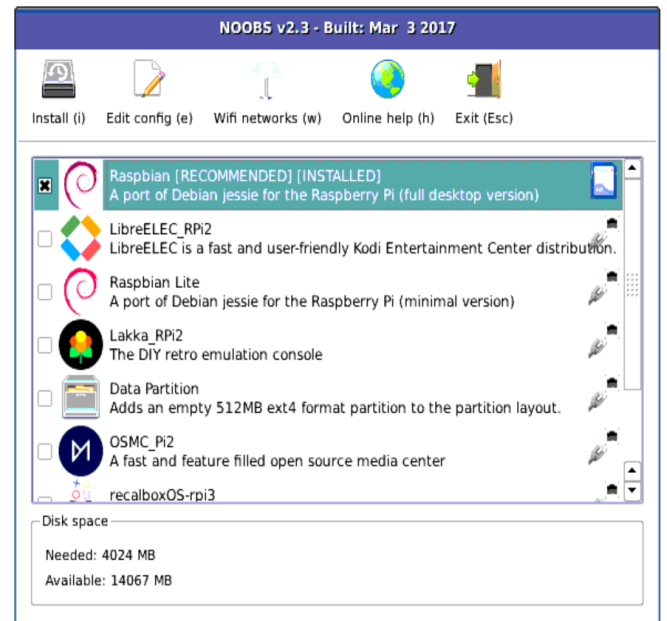
- Once you have NOOBS on your SD card, using it is incredibly easy.Just put the SD card into your Raspberry pi and start that suker up.First we have to install an operating system like Raspbian,LibreELEC or any of the others NOOBS gives you access to.

- This is the step in which that happens.After booting to NOOBS,you'll be greeted with a menu that will let you choose which operating system you'd like to install on your pi.Your menu may look a little bit different than the one in the screenshot above,because NOOBS ingeniously adapts to your generation and model of Raspberry pi.

- Which OS should you choose?well,that's up to you.Raspbian is probably the most frequently used,and you'll find plenty of projects here on our site that utilize it.Once you've decided just hit "Install" and the software will install.

VNC(Virtual Network Computing)viewer:

VNC is a graphical desktop sharing system that allows you to remotely control the desktop interface of one computer from another or mobile device. VNC viewer transmits the keyboard and either mouse or touch events to VNC server.

Step 1:Enable VNC

First, make sure both your Raspberry pi and the other computer you're going to use are connected to the same network. In Raspbian click the applications menu icon at the top-left of the screen and select preferences Raspberry pi configuration.

<div align="center">Screenshot of interfaces enabled in Raspbian</div>

If you haven't changed Raspbian's password from the default 'raspberry', now is a good time to do so.Click the change password button and enter a new one. Now click the interfaces tab, and set the radio button next to VNC to enabled .Click OK a VNC button appears in the top right of the screen, at the end of the menu bar. Click it to open VNC server.

Step 2:Open VNC Viewer

You're now ready to connect to your Raspberry pi from another computer. We're going to use a windows PC, but you can connect from a Mac, Linux PC, or even another Raspberry pi on the same network.

Because we're using VNC server on Raspberry pi, it makes sense to use VNC viewer on the windows PC VNC viewer is available for Mac OS, Linux, Android, and IOS platforms, along with a web interface. Head to Real Mac and click download VNC viewer. Install and open software.

Step 3:Connect to Raspberry pi

Enter the IP address of your Raspberry pi into the search bar of VNC viewer. Press return to connect to Raspberry pi. The first time you do this, a window will appear with a warning 'VNC has no record of connecting to this VNC server so its identity cannot be checked. click continue. You need to enter the username(typically 'pi') and password for your Raspberry pi click on remember password and then OK to connect to Raspbian.

Step 4:Get Online

So far we've been working on your local network with a Real VNC account, you can access your Raspberry pi across the wider internet.Open VNC viewer on your PC and click the sign in button on the top left. It's most likely that you don't have an account already, so click 'sign up online'. This will take you to the Real VNC website. Enter your email address and click the 'Iam not a robot' checkbox.

Now create a password please choose a long and complex password that is not easy to guess.

Step 5:Sign in

Now you need to sign in with the same account on both VNC viewer on your PC and VNC server on Raspberry pi. The sign in window should still be displayed in the sign in window in VNC viewer on your PC. Open VNC server on your raspberry pi and click sign in to enable the cloud connectivity link.

Step 6:Send files

You can send and receive files from your Raspberry pi and Pc. We've created a blank test document in our documents folder called test.txt. Now click send files in the VNC viewer-File transfer window. Use the file picker to choose a file on your PC and click open. The file will be sent to the desktop of your Raspberry pi. A file transfer window will appear with 'Download complete',close it.

- Here the VNC viewer displays the Desktop of Raspberry pi and then we can run the code in that computer.

Python3 IDE:

If you are using Ubuntu 16.10 or newer, then you can easily install Python 3.6 with the following commands

$ sudo apt-get update

$ sudo apt-get install python 3.6

If you are using other Linux distribution, chances are you already have Python 3 pre-installed as well. If not,use your distribution's package manager.For example on Fedora,you wouls use dnf:

$ sudo dnf install python 3.9

Working with Python 3:

At this point, you may have system Python 2.7 available as well.

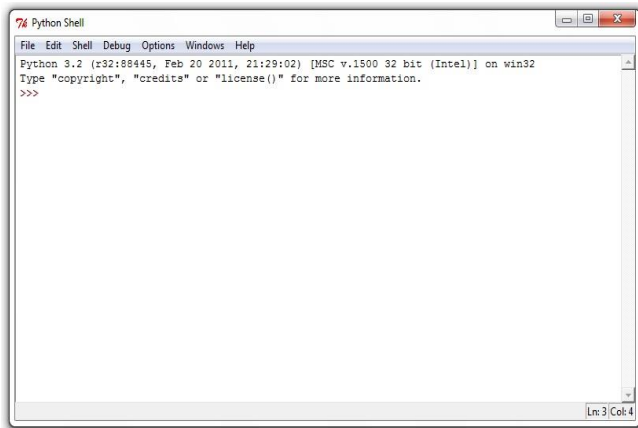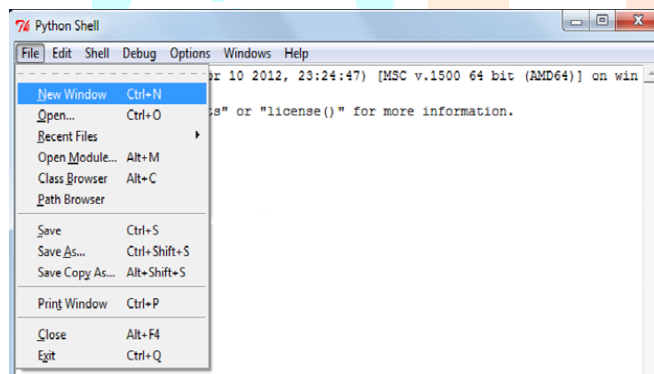$ python

This might launch the python 2 interpreter.

$ python 3

This will always launch the python 3 interpreter

A virtual Environment is a tool to keep the dependencies required by different projects in separated places , by creating virtual python environment for them.It solves the "project x depends on version 1.x but, project y needs 4.x" dilemma, and keeps your global site-packages directory clean and manageable .After installing the python3 software, go to command prompt and type "sudo idle". It will open the shell as below.
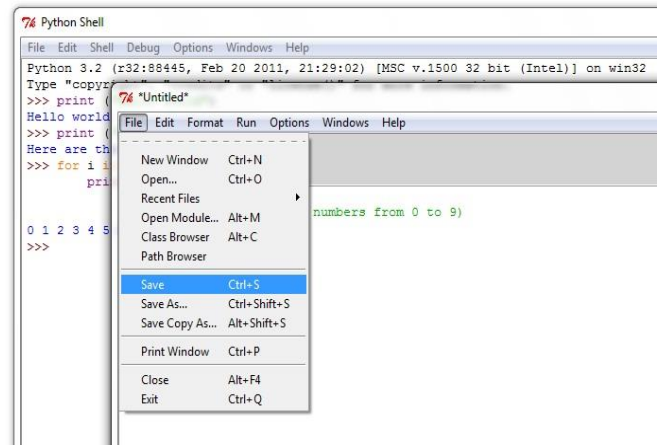
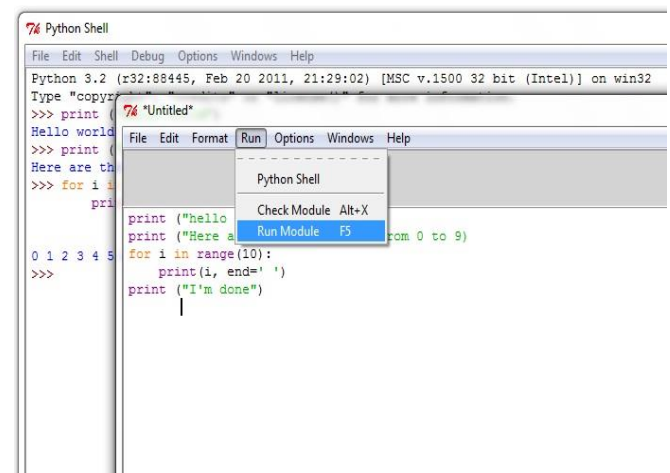Go to file and click on new windows

It will open new editor where we can write the code
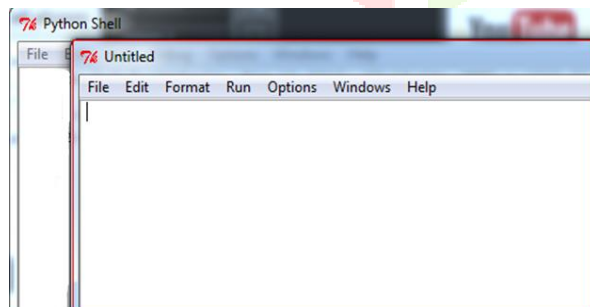
After editing the code , go to file and click on save.

After the file is successfully saved , Go to run and click on run module or press F5.

Python   is an interpreted high-level and general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant whitespace. It's language constructs and object-oriented approach aim to help programmers write clear ,logical code for small and large-scale projects.

Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured, object-oriented programming. Python is often described as a "batteries included" language due to its comprehensive standard library. Python intrepreters are supported for mainstream operating systems and available for a few more. A global community of pogrammers develops and maintains Python, a free and open-source reference implementation. A non-profit organization, the python software foundation manages and directs resources for python and c Python development. As of December 2020 python ranked third in TIOBE's index of most popular programming languages, behind C and Java.

Conclusion:

An effective solution to ensure coronavirus safety compliance in the work. The system relies on open source software and widely available sensors to make a low cost and easy to configure and customize set up. It relays useful real-time information wirelessly to a dashboard which can be used to monitor and assist in covid-19 SOP. The system is currently limited to entry level scanning. Future efforts will be focussed to expand the detection for the complete floor area, contact tracing, and support for additional queues. The system can be extended easily with minimal time and is quickly adaptable to different situations.

Advantages:

● This is safest method while going in public, in this covid-19 situation.

● Low cost and high effective system

● Compact system

● Accurate

References:

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