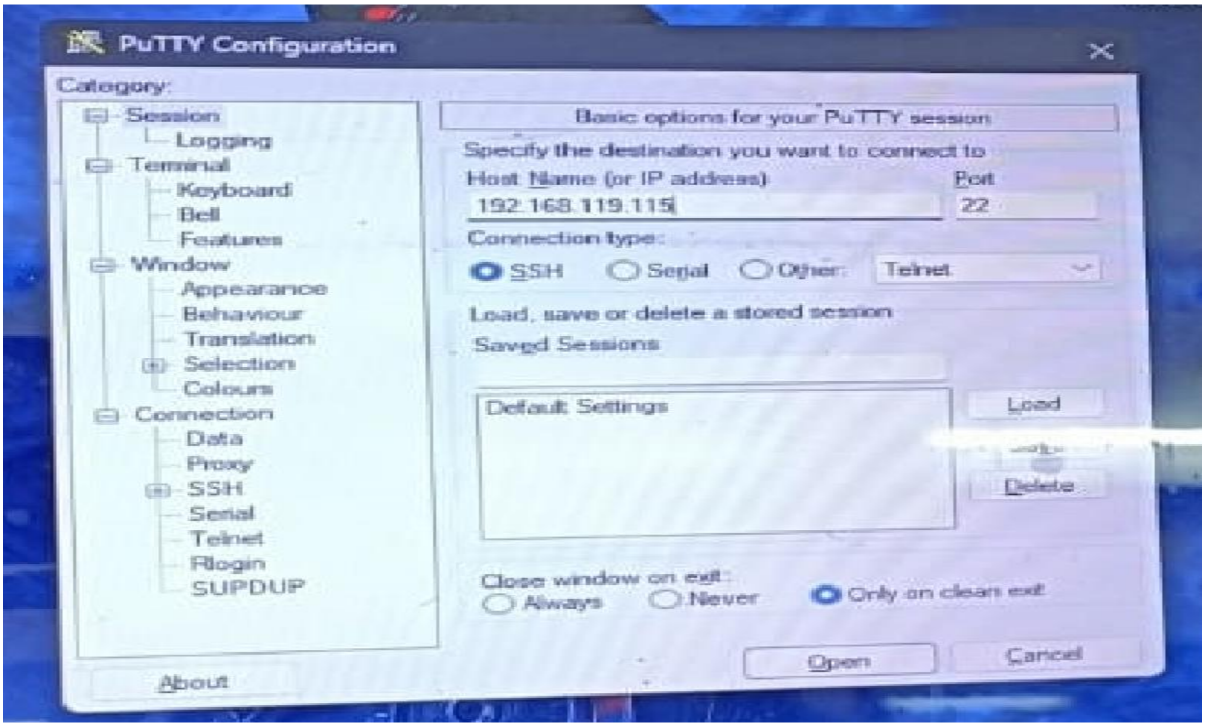
Practical No – 01

Aim - Making a Raspberry Pi headless, and reaching it from the network using WiFi and SSH.

Windows Configuration:

Step 1: Download putty and open, Host application for SSH

Step 2: Select SSH as connection type,



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): 192.168.119.115

Port: 22

Connection type: ● SSH ○ Serial ○ Other: Telnet

Load, save or delete a stored session

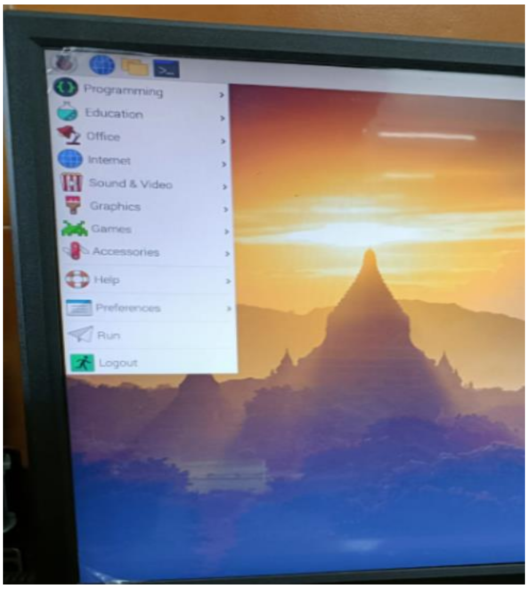
Saved Sessions

Default Settings

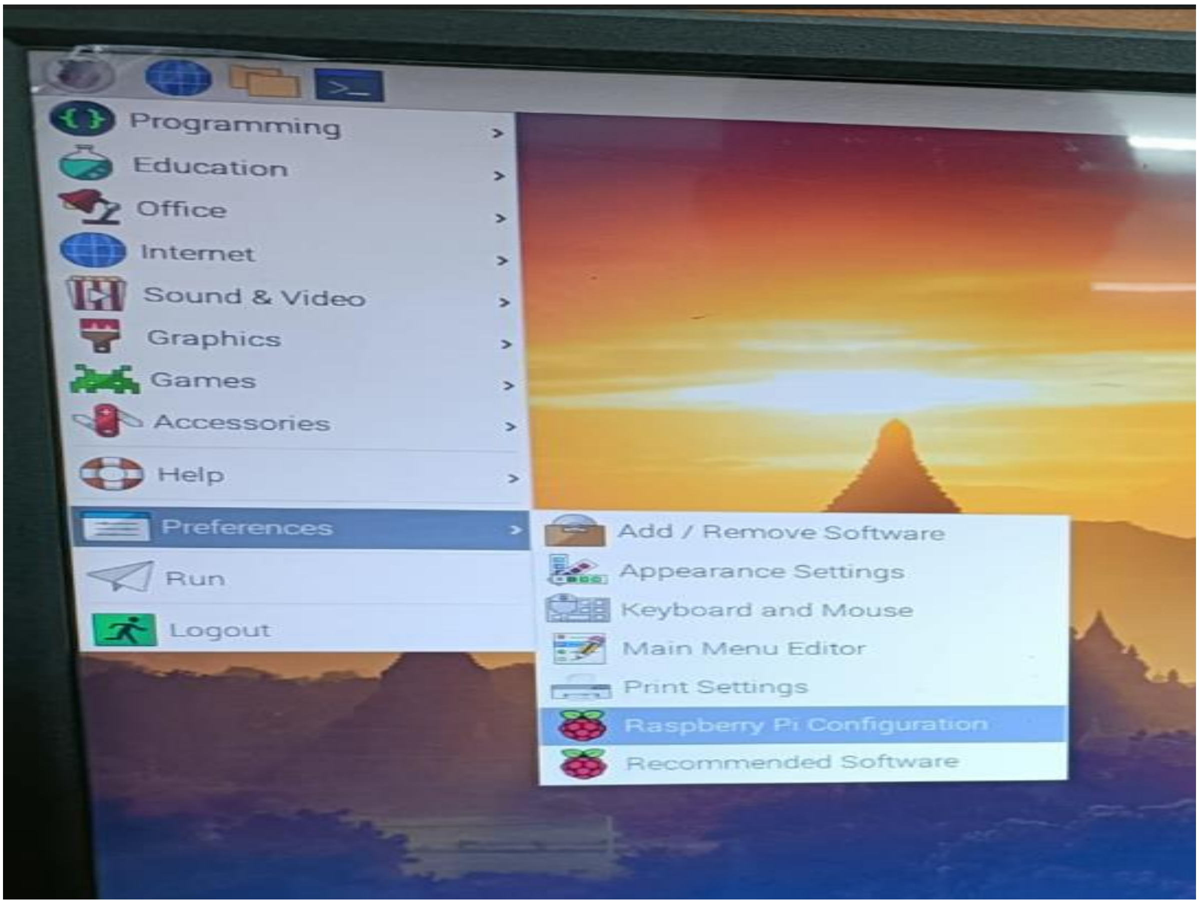
Close window on exit: ○ Always ○ Never ● Only on clean exit

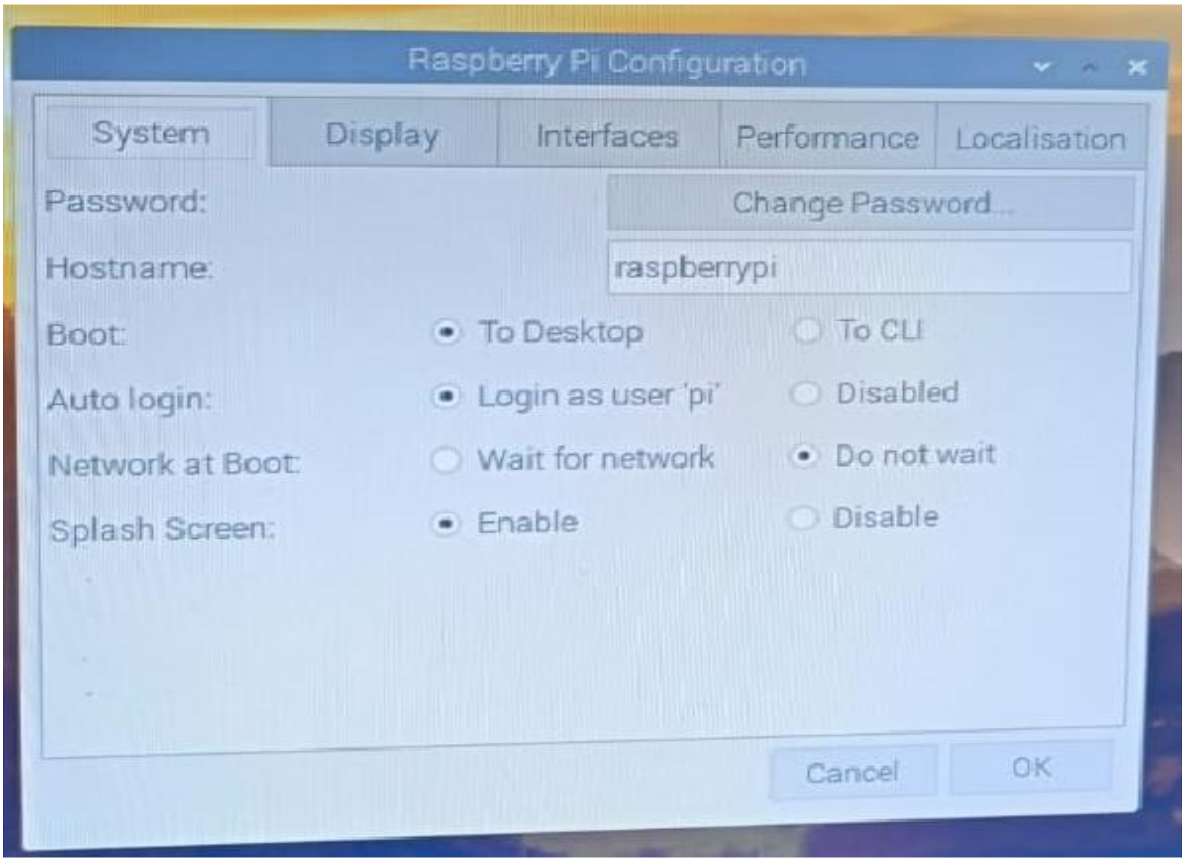
Raspberry pi configuration:

Step 3: Click on start menu,



Step 4: Go to Preferences -> Raspberry pi configuration -> Enter





Password:

Hostname: raspberrypi

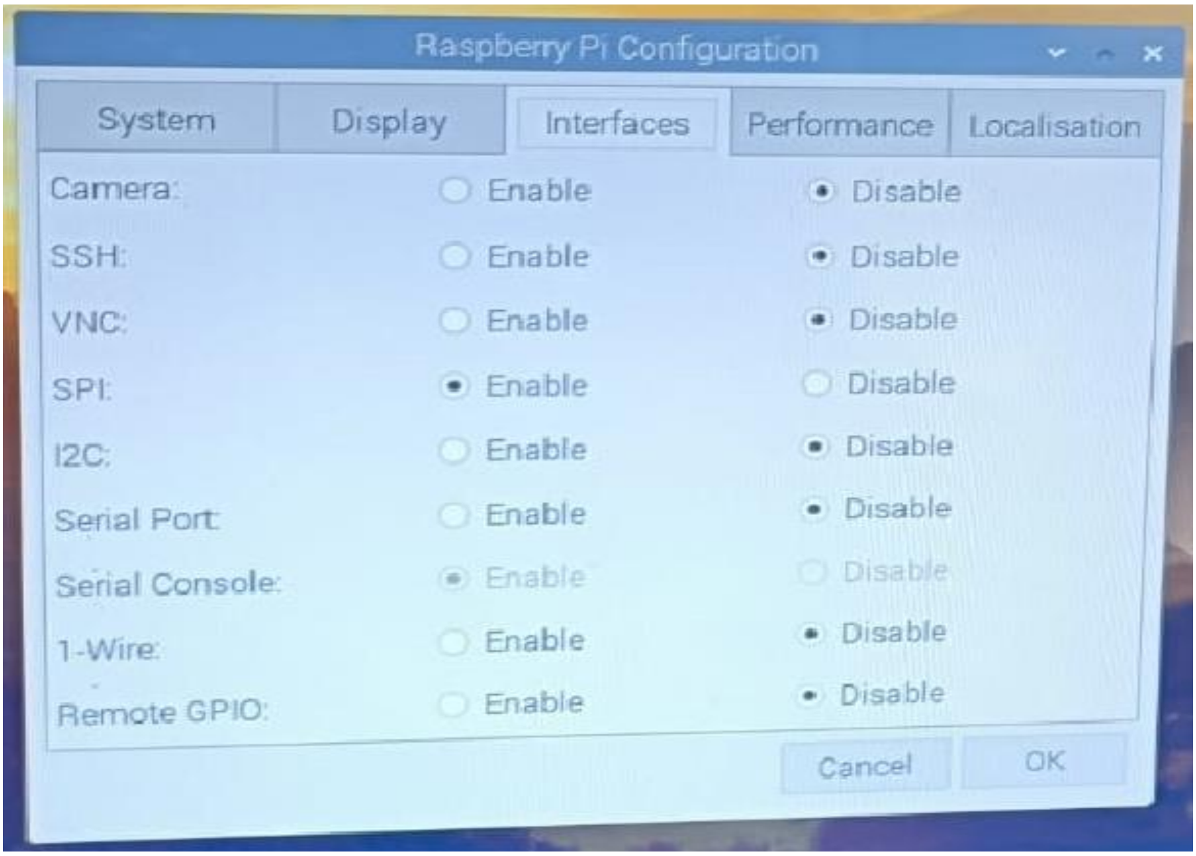
Boot: ● To Desktop ○ To CLI

Auto login: ● Login as user 'pi' ○ Disabled

Network at Boot: ○ Wait for network ● Do not wait

Splash Screen: ● Enable ○ Disable

Step 5: Interface -> Enable SSH and VNC Connections press OK.



Camera: ○ Enable ● Disable

SSH: ○ Enable ● Disable

VNC: ○ Enable ● Disable

SPI: ● Enable ○ Disable

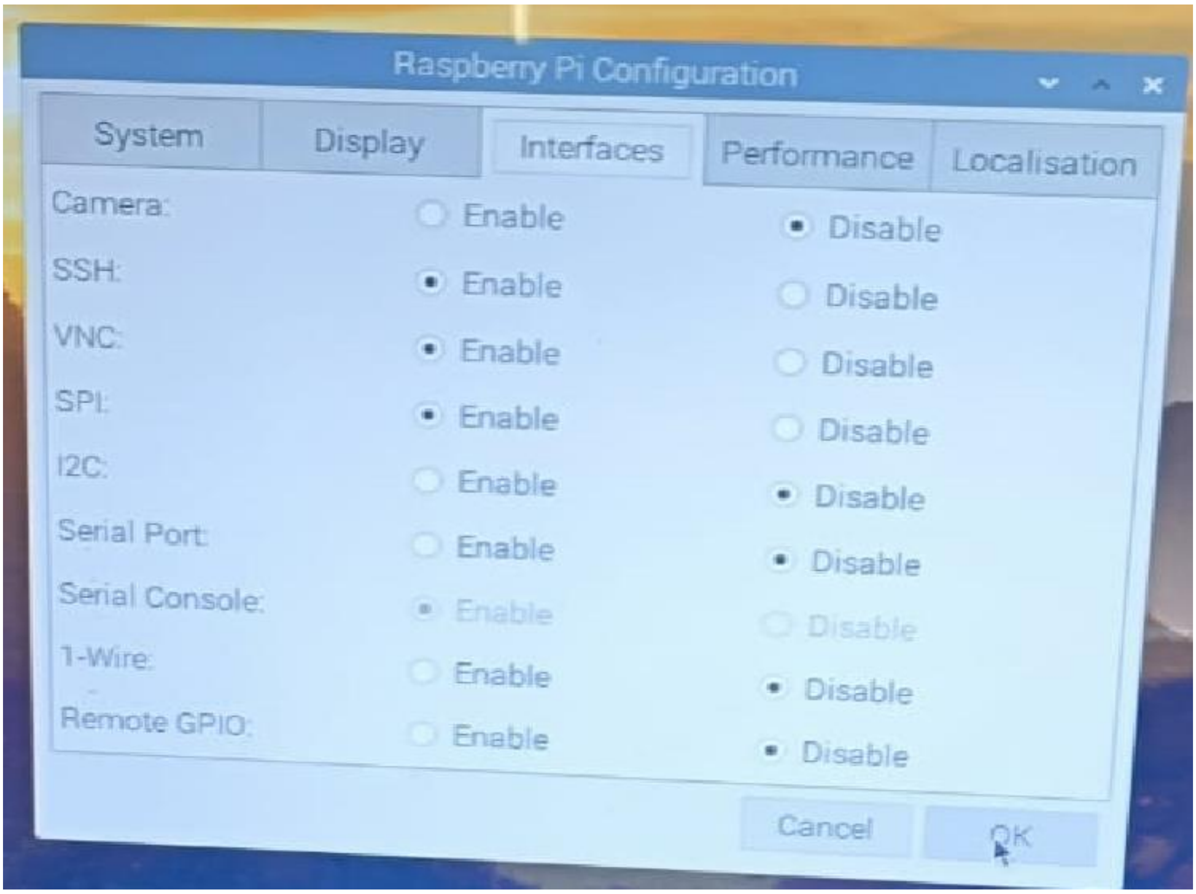
I2C: ○ Enable ● Disable

Serial Port: ○ Enable ● Disable

Serial Console: ● Enable ○ Disable

1-Wire: ○ Enable ● Disable

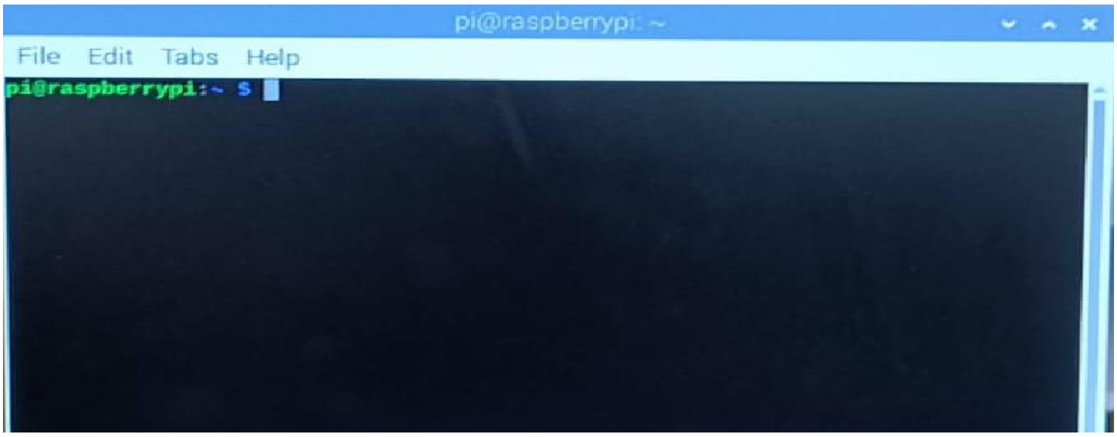
Remote GPIO: ○ Enable ● Disable



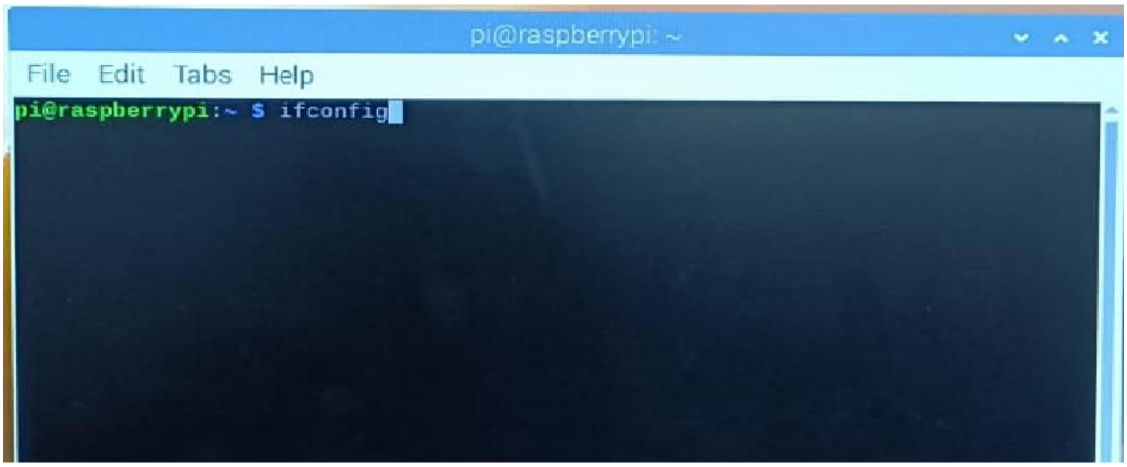
Camera: ○ Enable ● Disable
SSH: ● Enable ○ Disable
VNC: ● Enable ○ Disable
SPI: ● Enable ○ Disable
I2C: ○ Enable ● Disable
Serial Port: ○ Enable ● Disable
Serial Console: ● Enable ○ Disable
1-Wire: ○ Enable ● Disable
Remote GPIO: ○ Enable ● Disable

Step 6: Open New terminals and type below command,

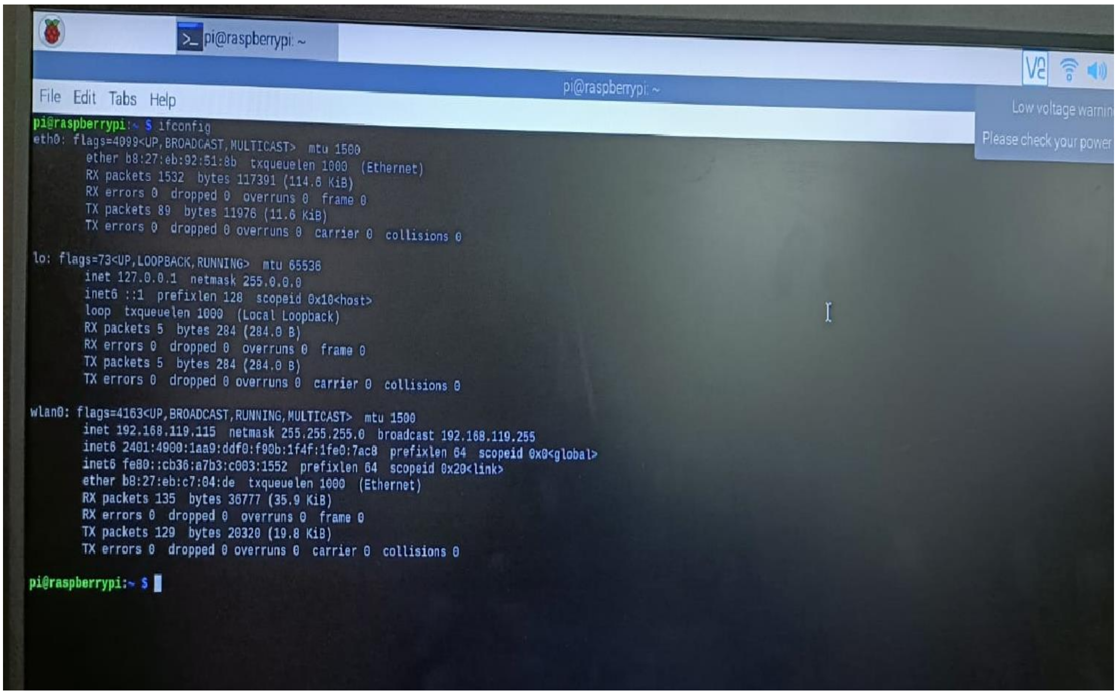
>>>ifconfig



```
pi@raspberrypi:~ $ 
```



```
pi@raspberrypi:~ $ ifconfig
```



```
pi@raspberrypi:~ $ ifconfig
eth0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether b8:27:eb:92:51:8b  txqueuelen 1000  (Ethernet)
        RX packets 1532  bytes 117391 (114.6 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 89  bytes 11976 (11.6 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 5  bytes 284 (284.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 5  bytes 284 (284.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.119.115  netmask 255.255.255.0  broadcast 192.168.119.255
        inet6 2401:4900:1aa9:ddf0:f90b:1f4f:1fe0:7ac8  prefixlen 64  scopeid 0x0<global>
        inet6 fe80::cb36:a7b3:c003:1552  prefixlen 64  scopeid 0x20<link>
        ether b8:27:eb:c7:04:de  txqueuelen 1000  (Ethernet)
        RX packets 135  bytes 36777 (35.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 129  bytes 20320 (19.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

pi@raspberrypi:~ $
```

Note: Make sure both PCs are connected with same network.

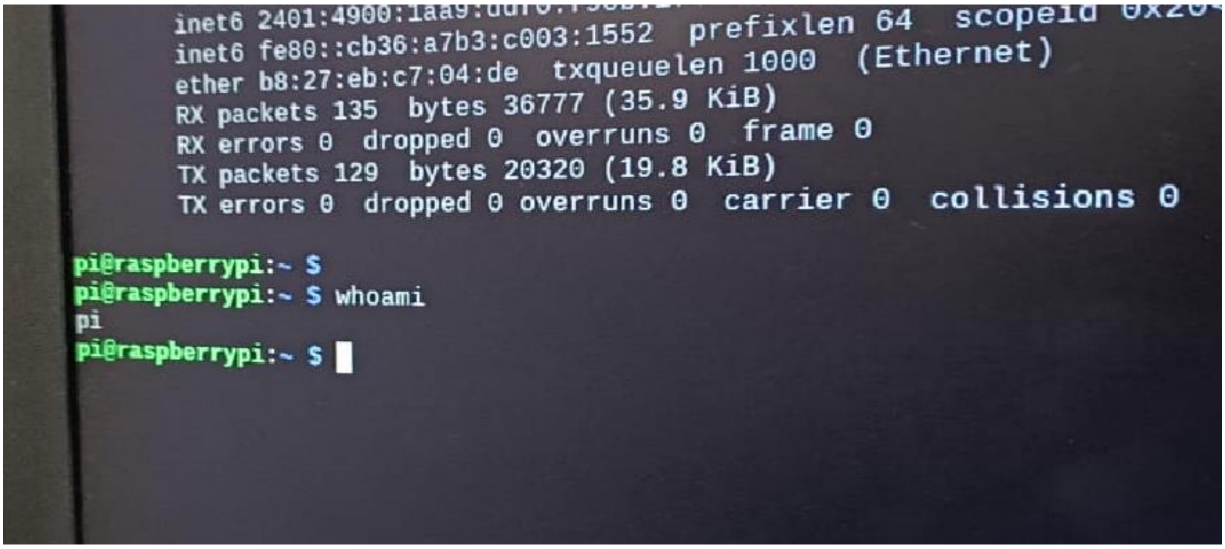
Step 7: Connection Part,

->Go to putty, Enter ip and click on open.

->Enter requested Username(pi) and Password(raspberry):

->For finding Username type below command on terminal,

$whoami

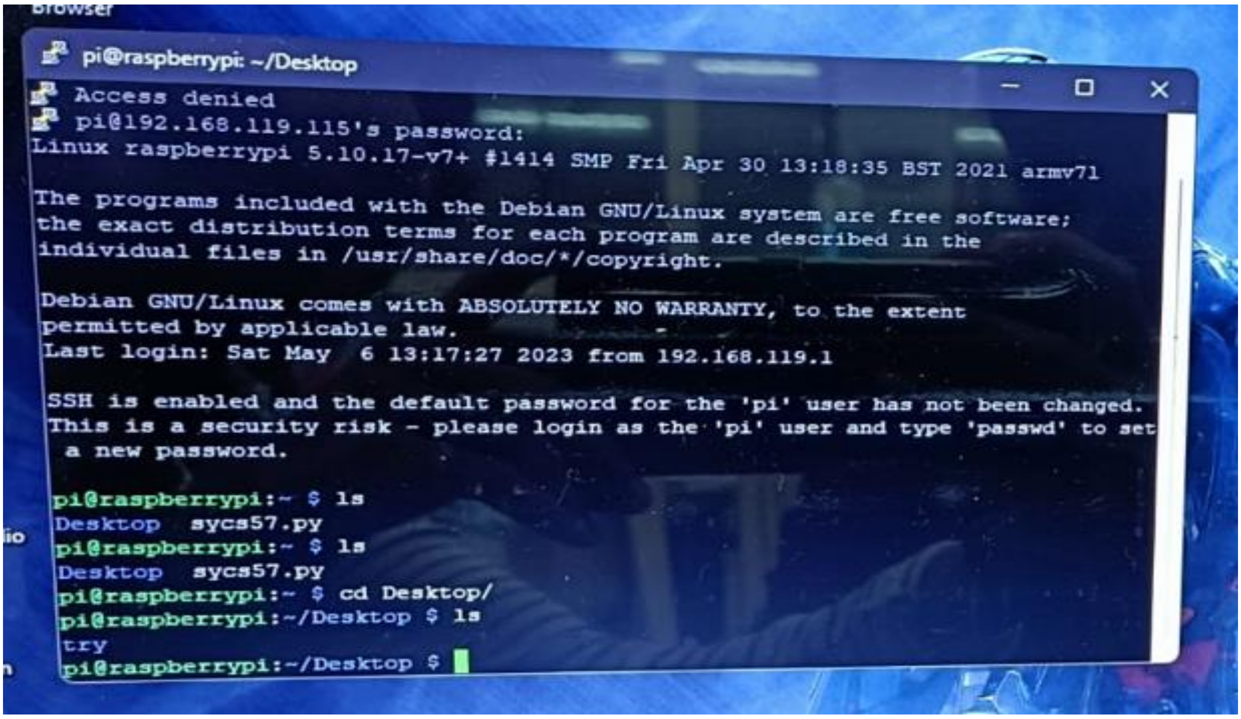


```
        inet6 2401:4900:1aa9:dd
        inet6 fe80::cb36:a7b3:c003:1552  prefixlen 64  scopeid
        ether b8:27:eb:c7:04:de  txqueuelen 1000  (Ethernet)
        RX packets 135  bytes 36777 (35.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 129  bytes 20320 (19.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

pi@raspberrypi:~ $
pi@raspberrypi:~ $ whoami
pi
pi@raspberrypi:~ $
```

Connected Successfully.

Step 8: For checking connection run below commands,

Output: "try" folder name are showing which is present on another system desktop.



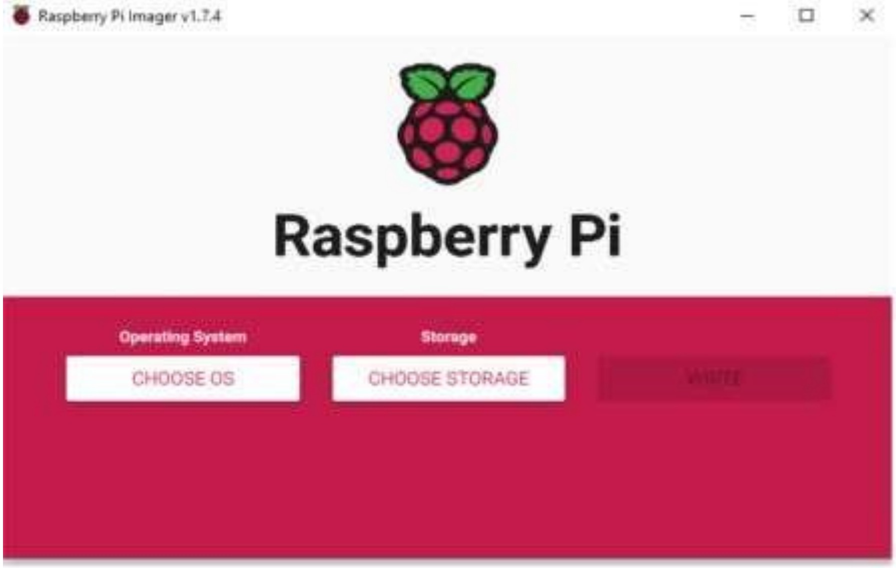
```
Access denied
pi@192.168.119.115's password:
Linux raspberrypi 5.10.17-v7+ #1414 SMP Fri Apr 30 13:18:35 BST 2021 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sat May  6 13:17:27 2023 from 192.168.119.1

SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
 a new password.

pi@raspberrypi:~ $ ls
Desktop  sycs57.py
pi@raspberrypi:~ $ ls
Desktop  sycs57.py
pi@raspberrypi:~ $ cd Desktop/
pi@raspberrypi:~/Desktop $ ls
try
pi@raspberrypi:~/Desktop $
```

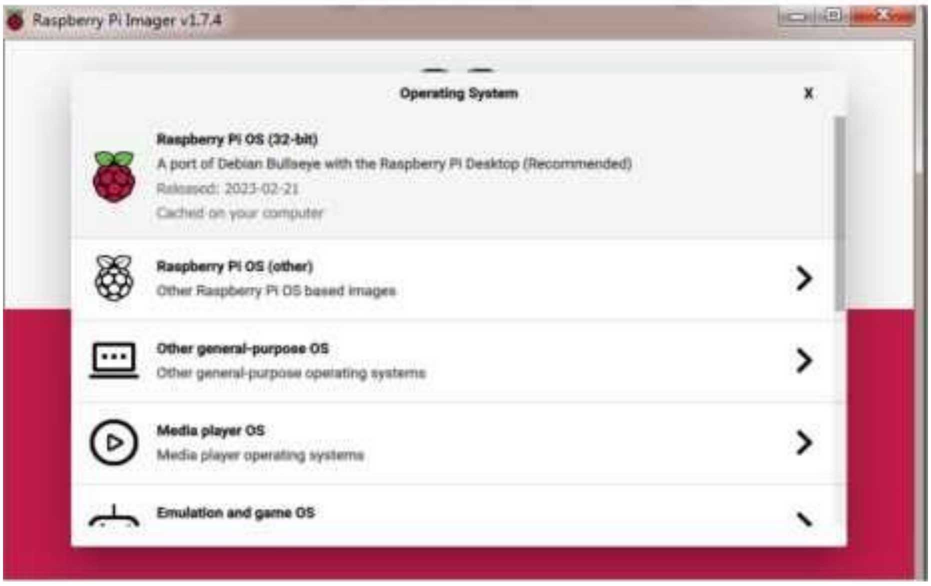
Practical No – 02

Aim : Using sftp upload files from PC

Software required:-Filezilla, Github

Step 1: Install the Raspberry Pi Imager





Raspberry Pi OS (32-bit)
A port of Debian Bullseye with the Raspberry Pi Desktop (Recommended)
Released: 2023-02-21
Cached on your computer

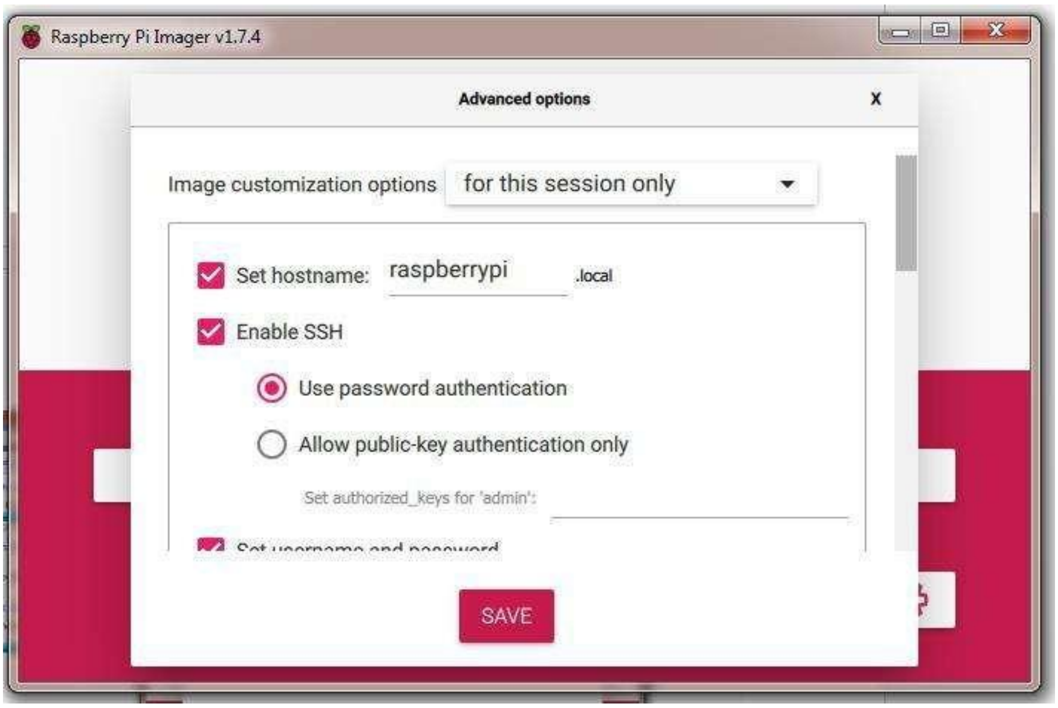
Raspberry Pi OS (other)
Other Raspberry Pi OS based images

Other general-purpose OS
Other general-purpose operating systems

Media player OS
Media player operating systems

Emulation and game OS

Step 2: Set Host Name , enable SSH, Set Usernameand Password.



Raspberry Pi Imager v1.7.4

Advanced options

Image customization options: for this session only

☑ Set hostname: raspberrypi .local

☑ Enable SSH

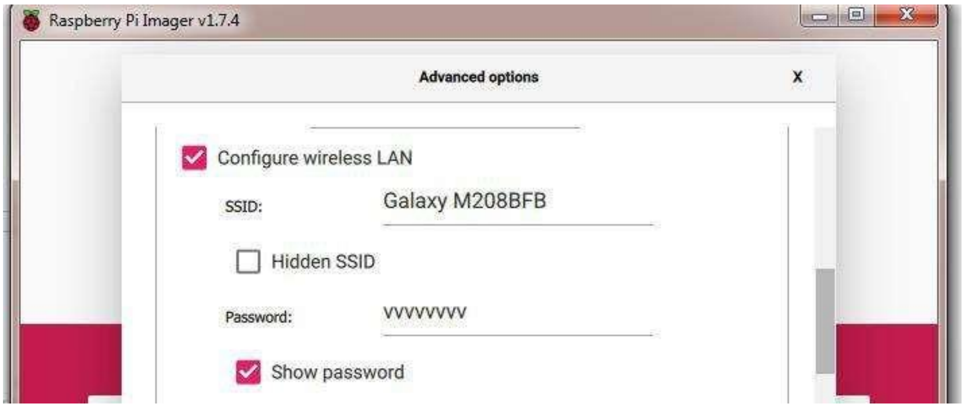
● Use password authentication

○ Allow public-key authentication only

Set authorized_keys for 'admin':

☑ Set username and password

Step 3: Set SSID and Password of hotspot which is used .



Raspberry Pi Imager v1.7.4

Advanced options

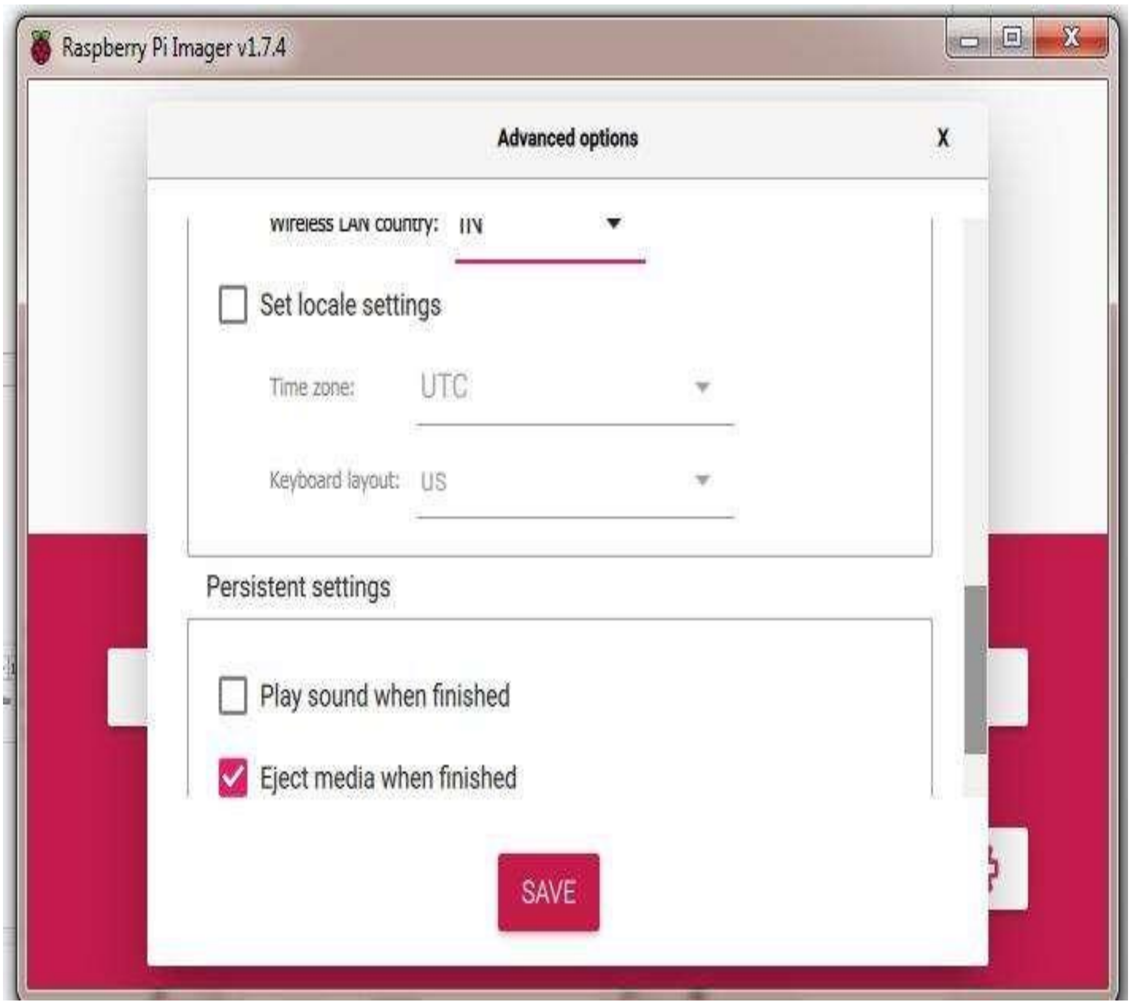
☑ Configure wireless LAN

SSID: Galaxy M208BFB

□ Hidden SSID

Password: vvvvvvvv

☑ Show password



Raspberry Pi Imager v1.7.4

Advanced options

X

Wireless LAN country: IN

□ Set locale settings

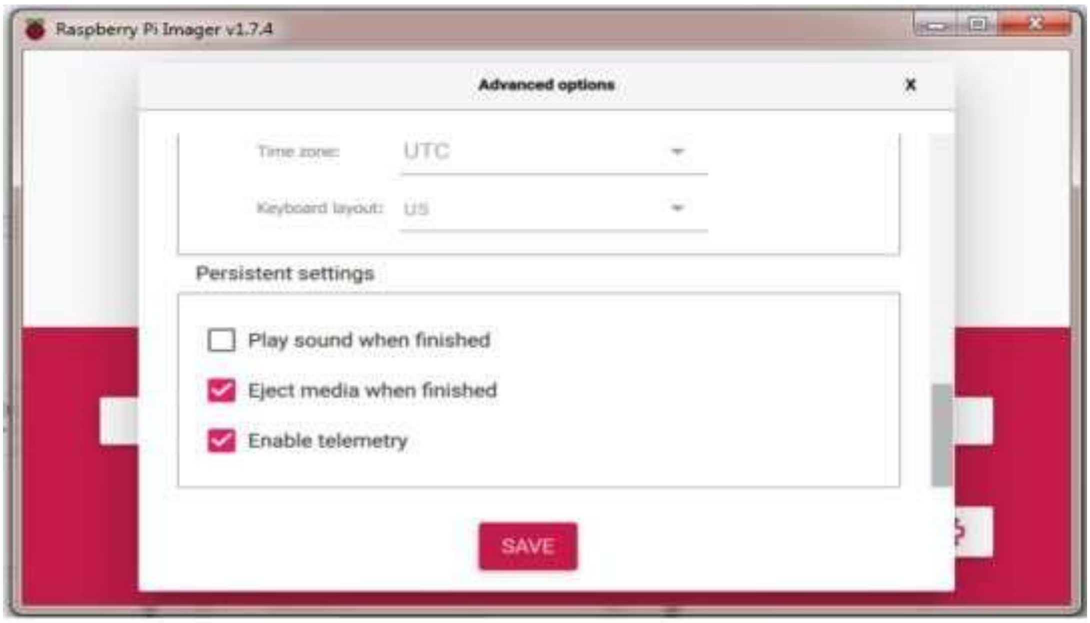
Time zone: UTC

Keyboard layout: US

Persistent settings

□ Play sound when finished

☑ Eject media when finished



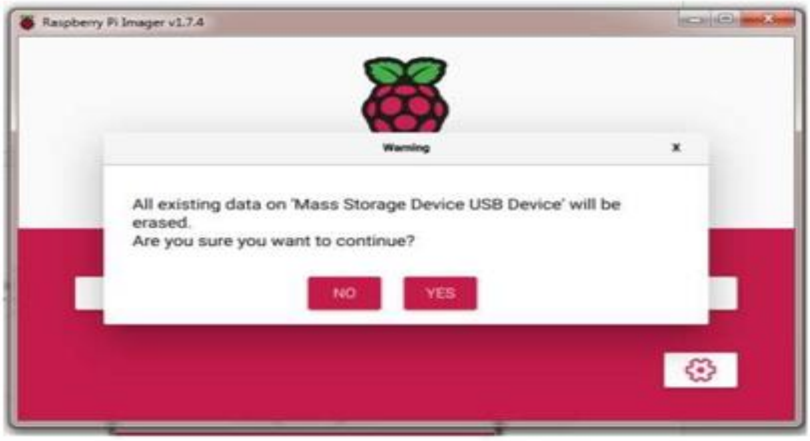
Time zone: UTC

Keyboard layout: US

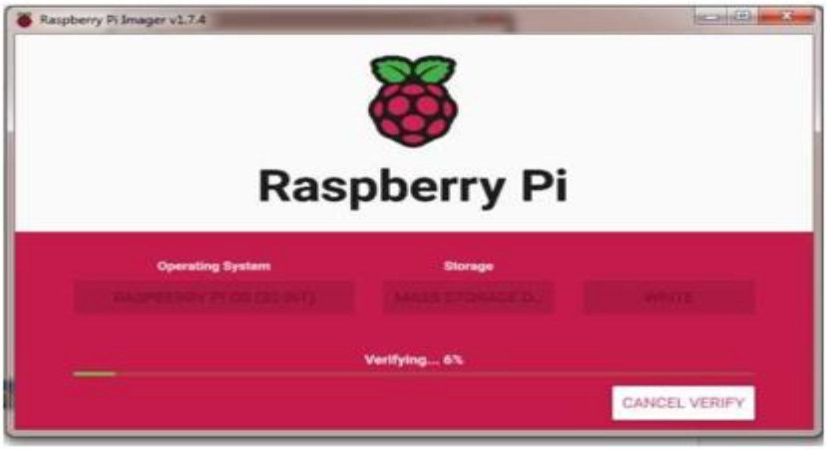
Persistent settings

- □ Play sound when finished
- ☑ Eject media when finished
- ☑ Enable telemetry

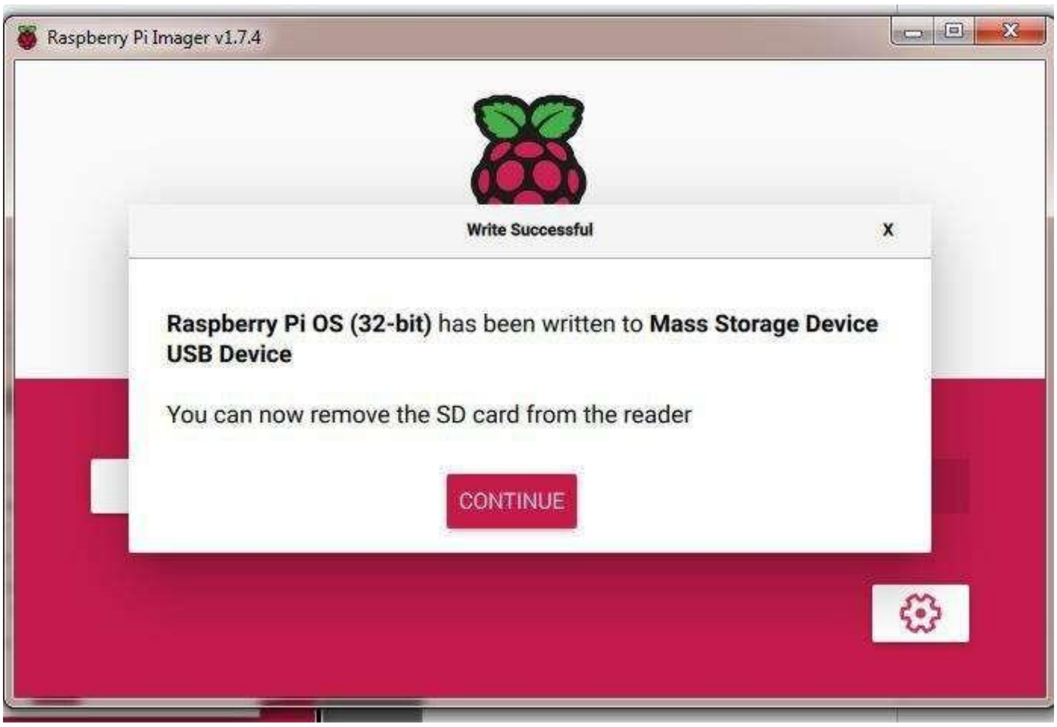
on



All existing data on 'Mass Storage Device USB Device' will be erased.
Are you sure you want to continue?



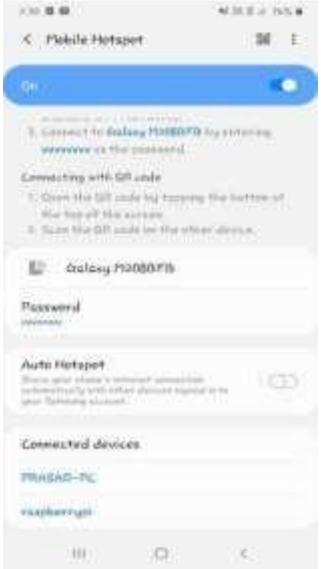
Verifying... 6%



Raspberry Pi OS (32-bit) has been written to **Mass Storage Device USB Device**

You can now remove the SD card from the reader

Step 4: Connect Raspberry Pi WIFI and Laptop WIFI to Mobile



Mobile Hotspot

On

Connecting with QR code

Galaxy M20BBF1b

Password

Auto Hotspot

Connected devices

PRASAD-PC

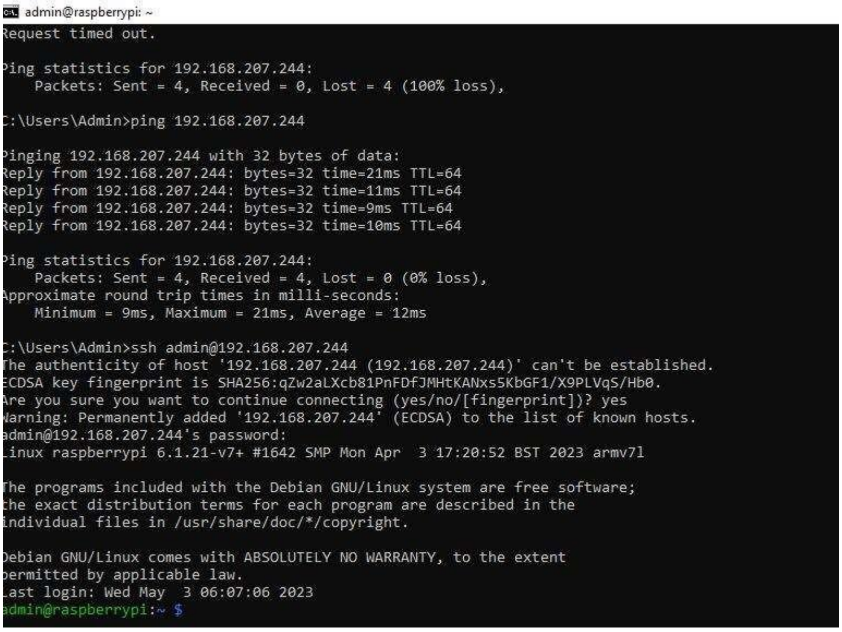
raspberrypi

Step 5: Open CMD and tyepe following command

I) ping raspberrypi or ping 162.168.207.244

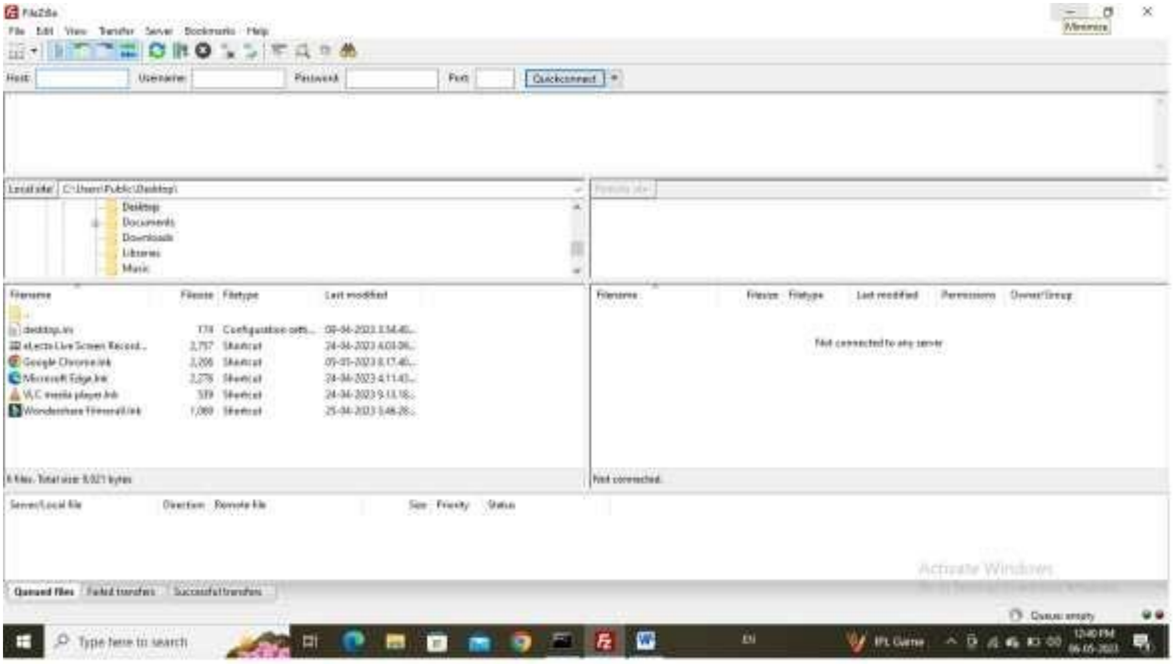
II) ssh admin@ raspberrypi or sshadmin@ 162.168.207.244

And type the password



```
admin@raspberrypi: ~
Request timed out.

Ping statistics for 192.168.207.244:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Admin>ping 192.168.207.244

Pinging 192.168.207.244 with 32 bytes of data:
Reply from 192.168.207.244: bytes=32 time=21ms TTL=64
Reply from 192.168.207.244: bytes=32 time=11ms TTL=64
Reply from 192.168.207.244: bytes=32 time=9ms TTL=64
Reply from 192.168.207.244: bytes=32 time=10ms TTL=64

Ping statistics for 192.168.207.244:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 21ms, Average = 12ms

C:\Users\Admin>ssh admin@192.168.207.244
The authenticity of host '192.168.207.244 (192.168.207.244)' can't be established.
ECDSA key fingerprint is SHA256:qZw2aLXcb81PnFDfJMHtKANxs5KbGF1/X9PLVqS/Hb0.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.207.244' (ECDSA) to the list of known hosts.
admin@192.168.207.244's password:
Linux raspberrypi 6.1.21-v7+ #1642 SMP Mon Apr  3 17:20:52 BST 2023 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Wed May  3 06:07:06 2023
admin@raspberrypi:~ $
```

Step:6 Download the FileZilla (Client)



Host: Username: Password: Port: Quickconnect

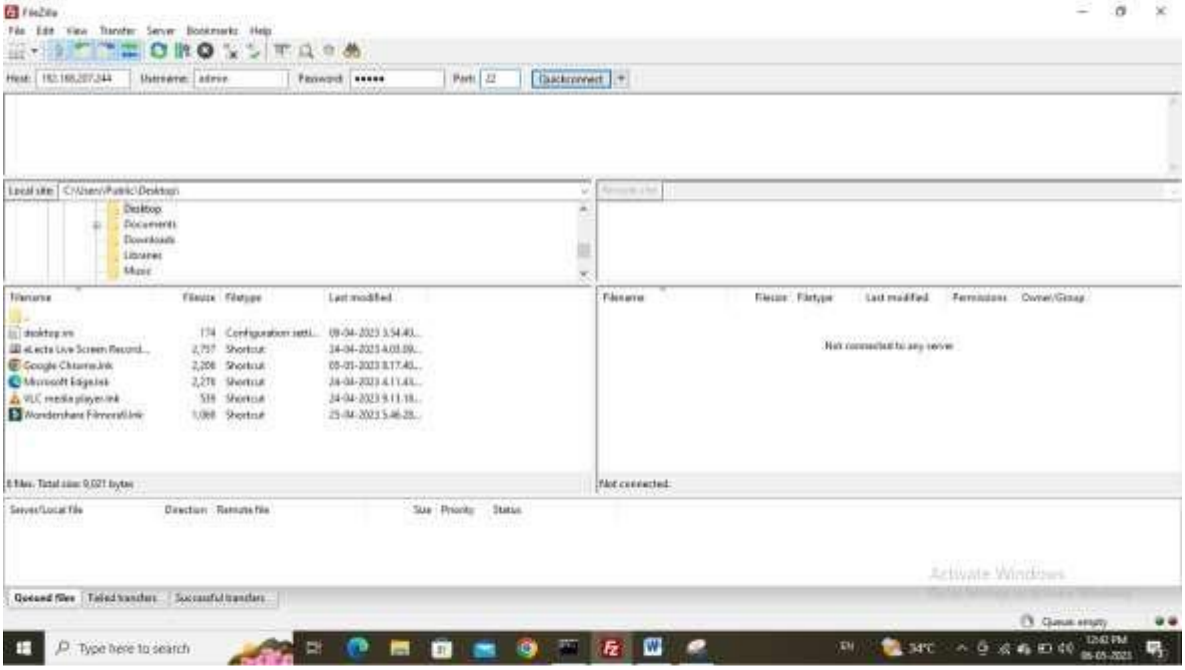
Local site: C:\Users\Public\Desktop\

Filename	Filesize	Filetype	Last modified
..			
desktop.ini	174	Configuration setti...	09-04-2023 3:54:40...
eLecta Live Screen Record...	2,757	Shortcut	24-04-2023 4:03:09...
Google Chrome.lnk	2,206	Shortcut	05-05-2023 8:17:40...
Microsoft Edge.lnk	2,276	Shortcut	24-04-2023 4:11:43...
VLC media player.lnk	539	Shortcut	24-04-2023 9:11:18...
Wondershare Filmora9.lnk	1,069	Shortcut	25-04-2023 5:46:28...

6 files. Total size: 9,021 bytes

Not connected to any server

Not connected.



Host: 192.168.207.244 Username: admin Password: ••••• Port: 22 Quickconnect

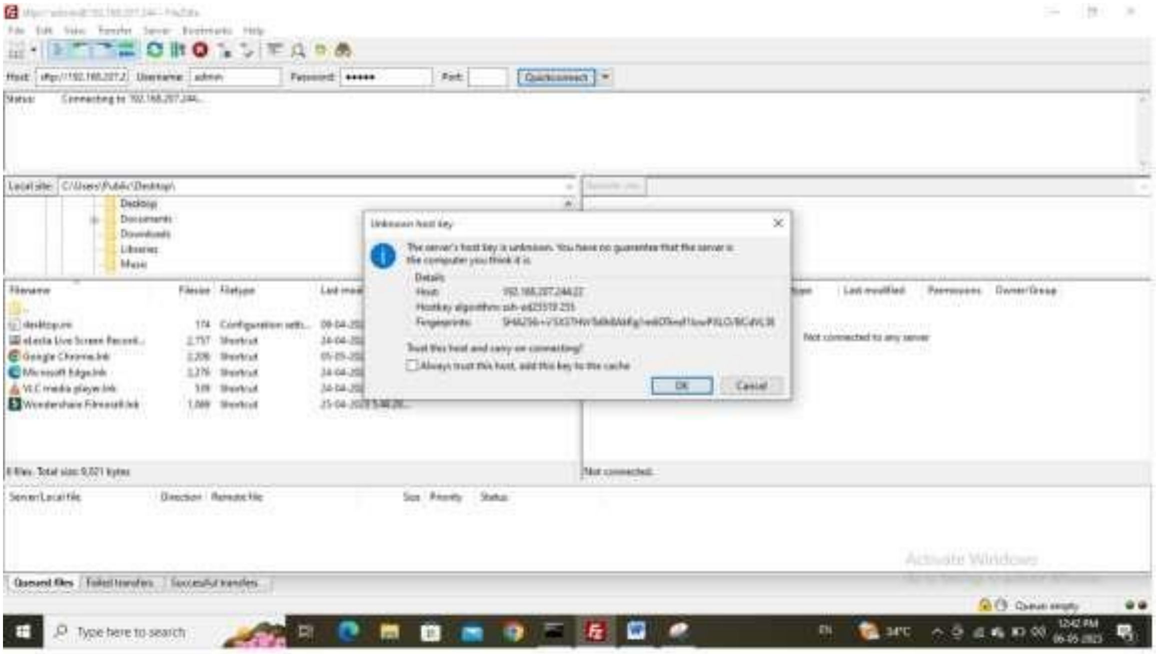
Local site: C:\Users\Public\Desktop\

Filename	Filesize	Filetype	Last modified
..			
desktop.ini	174	Configuration setti...	09-04-2023 3:54:40...
eLecta Live Screen Record...	2,757	Shortcut	24-04-2023 4:03:09...
Google Chrome.lnk	2,206	Shortcut	05-05-2023 8:17:40...
Microsoft Edge.lnk	2,276	Shortcut	24-04-2023 4:11:43...
VLC media player.lnk	539	Shortcut	24-04-2023 9:11:18...
Wondershare Filmora9.lnk	1,069	Shortcut	25-04-2023 5:46:28...

6 files. Total size: 9,021 bytes

Not connected to any server

Not connected.



sftp://admin@192.168.207.244 - FileZilla

Host: sftp://192.168.207.2 Username: admin Password: ●●●●● Port:

```
Status:	Connecting to 192.168.207.244...
```

Local site: C:\Users\Public\Desktop\

Unknown host key

The server's host key is unknown. You have no guarantee that the server is the computer you think it is.

Details

Host: 192.168.207.244:22

Hostkey algorithm: ssh-ed25519 255

Fingerprints: SHA256:+/1SX3THW5kMkbkfg/ne8Okmf1lowP3LO/BC4VL38

Trust this host and carry on connecting?

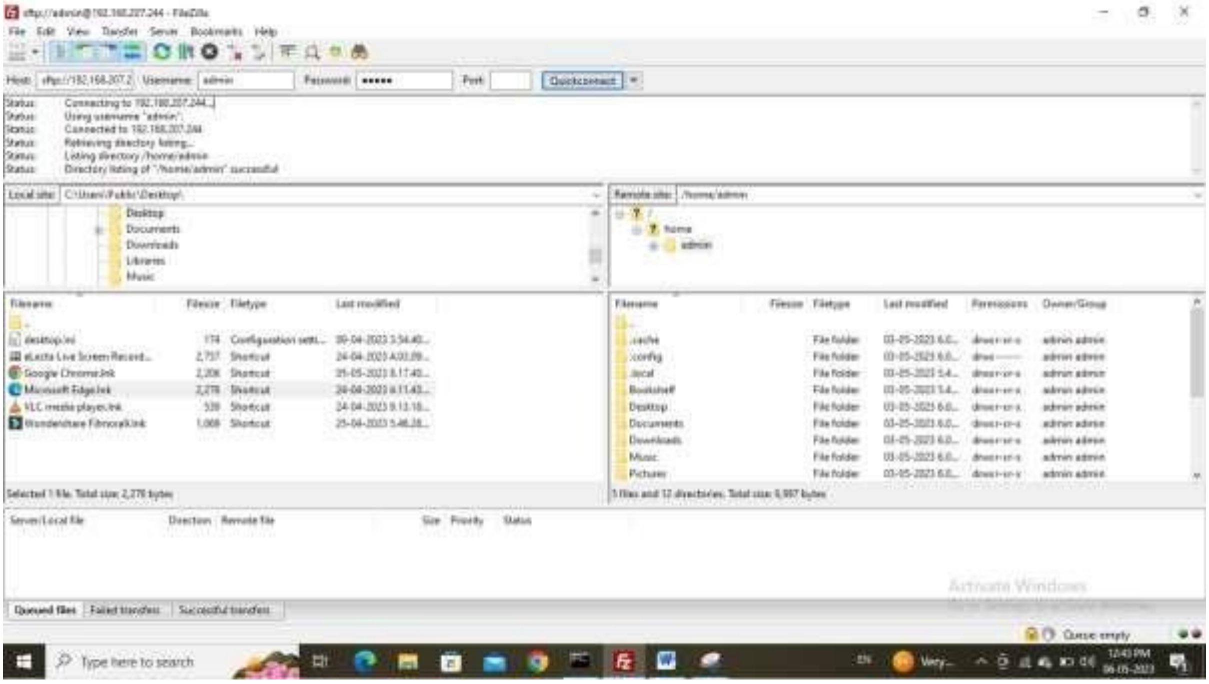
☐ Always trust this host, add this key to the cache

Filename	Filesize	Filetype	Last modified
..			
desktop.ini	174	Configuration setti...	09-04-202...
eLecta Live Screen Record...	2,737	Shortcut	24-04-202...
Google Chrome.lnk	2,206	Shortcut	05-05-202...
Microsoft Edge.lnk	2,278	Shortcut	24-04-202...
VLC media player.lnk	539	Shortcut	24-04-202...
Wondershare Filmora9.lnk	1,088	Shortcut	25-04-2023 5:46:26...

6 files. Total size: 9,021 bytes

Not connected to any server

Not connected.



sftp://admin@192.168.207.244 - FileZilla

Host: sftp://192.168.207.2 Username: admin Password: ●●●●● Port:

```
Status:	Connecting to 192.168.207.244...
Status:	Using username "admin".
Status:	Connected to 192.168.207.244
Status:	Retrieving directory listing...
Status:	Listing directory /home/admin
Status:	Directory listing of "/home/admin" successful
```

Local site: C:\Users\Public\Desktop\

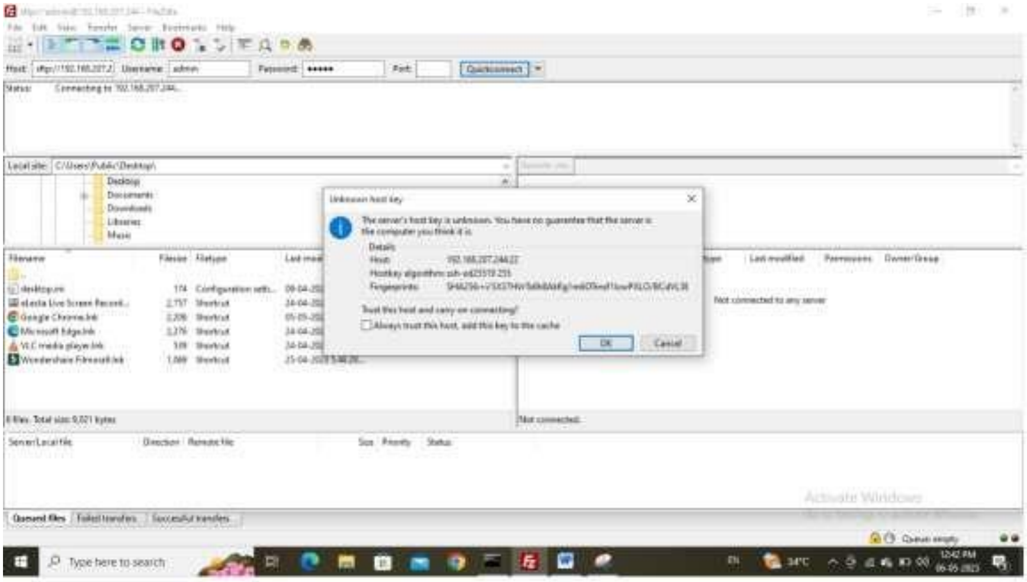
Remote site: /home/admin

Filename	Filesize	Filetype	Last modified
..			
desktop.ini	174	Configuration setti...	09-04-2023 3:54:40...
eLecta Live Screen Record...	2,737	Shortcut	24-04-2023 4:03:09...
Google Chrome.lnk	2,206	Shortcut	05-05-2023 8:17:40...
Microsoft Edge.lnk	2,278	Shortcut	24-04-2023 4:11:43...
VLC media player.lnk	539	Shortcut	24-04-2023 9:13:18...
Wondershare Filmora9.lnk	1,088	Shortcut	25-04-2023 5:46:28...

Selected 1 file. Total size: 2,278 bytes

Filename	Filesize	Filetype	Last modified	Permissions	Owner/Group
..					
.cache		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin
.config		File folder	03-05-2023 6:0...	drwx------	admin admin
.local		File folder	03-05-2023 5:4...	drwxr-xr-x	admin admin
Bookshelf		File folder	03-05-2023 5:4...	drwxr-xr-x	admin admin
Desktop		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin
Documents		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin
Downloads		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin
Music		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin
Pictures		File folder	03-05-2023 6:0...	drwxr-xr-x	admin admin

5 files and 12 directories. Total size: 6,987 bytes



```
Host: sftp://192.168.207.2  Username: admin  Password: •••••  Port:   Quickconnect
Status:    Connecting to 192.168.207.244...
```

Local site: C:\Users\Public\Desktop\

Unknown host key

The server's host key is unknown. You have no guarantee that the server is the computer you think it is.

Details

Host: 192.168.207.244:22

Hostkey algorithm: ssh-ed25519 255

Fingerprints: SHA256:+/1XSTHW5dkbAbfg/wdiOXwdf1bwPXLO/BCdVL8

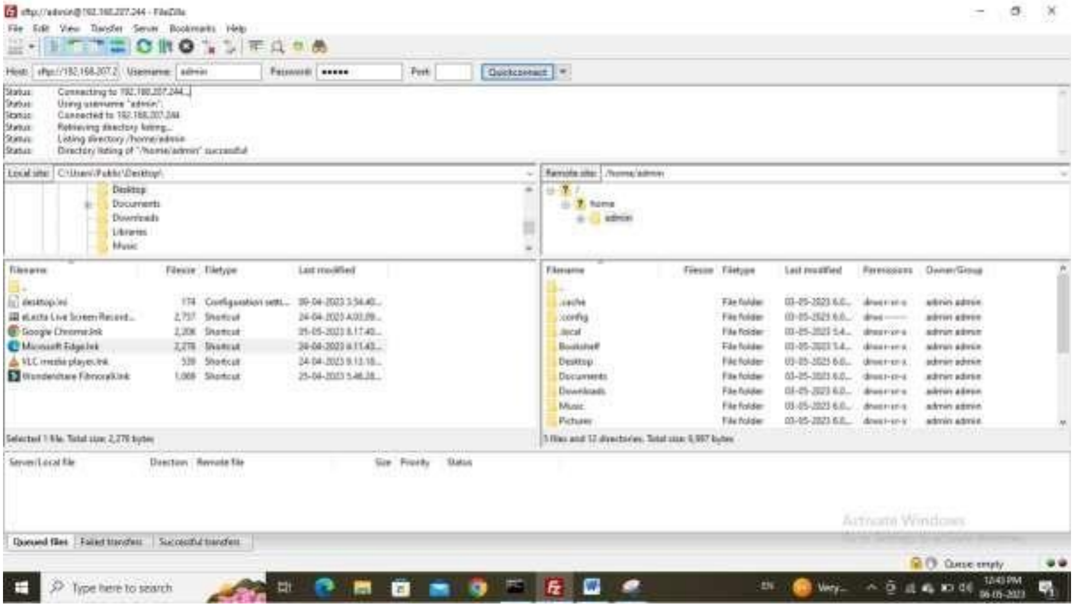
Trust this host and carry on connecting?

□ Always trust this host, add this key to the cache

```
Filename                       Filesize  Filetype             Last modified
desktop.ini                         174  Configuration setti... 09-04-20...
eLecta Live Screen Record...      2,757  Shortcut             24-04-20...
Google Chrome.lnk                 2,206  Shortcut             05-05-20...
Microsoft Edge.lnk                2,276  Shortcut             24-04-20...
VLC media player.lnk                539  Shortcut             24-04-20...
Wondershare Filmora9.lnk          1,069  Shortcut             25-04-2023 5:46:26...
6 files. Total size: 9,021 bytes
```

Not connected to any server

Not connected.



sftp://admin@192.168.207.244 - FileZilla

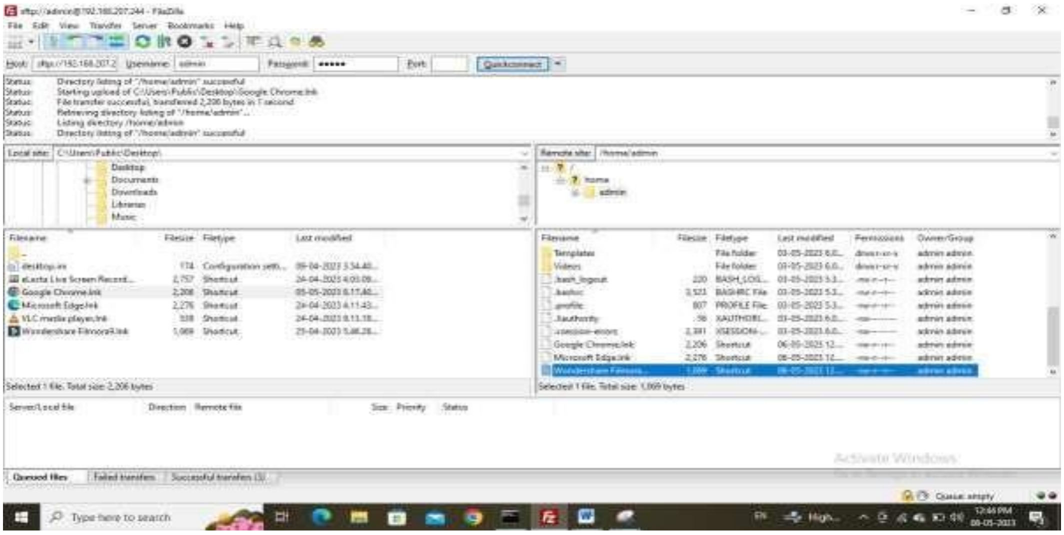
```
Status:    Connecting to 192.168.207.244...
Status:    Using username "admin".
Status:    Connected to 192.168.207.244
Status:    Retrieving directory listing...
Status:    Listing directory /home/admin
Status:    Directory listing of "/home/admin" successful
```

Local site: C:\Users\Public\Desktop\

Remote site: /home/admin

```
Filename                       Filesize  Filetype             Last modified
desktop.ini                         174  Configuration setti... 09-04-2023 3:54:40...
eLecta Live Screen Record...      2,757  Shortcut             24-04-2023 4:03:09...
Google Chrome.lnk                 2,206  Shortcut             05-05-2023 8:17:40...
Microsoft Edge.lnk                2,276  Shortcut             24-04-2023 4:11:43...
VLC media player.lnk                539  Shortcut             24-04-2023 9:13:18...
Wondershare Filmora9.lnk          1,069  Shortcut             25-04-2023 5:46:28...
Selected 1 file. Total size: 2,276 bytes
```

```
Filename     Filesize  Filetype     Last modified     Permissions  Owner/Group
.cache                 File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
.config                File folder  03-05-2023 6:0... drwx------   admin admin
.local                 File folder  03-05-2023 5:4... drwxr-xr-x   admin admin
Bookshelf              File folder  03-05-2023 5:4... drwxr-xr-x   admin admin
Desktop                File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
Documents              File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
Downloads              File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
Music                  File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
Pictures               File folder  03-05-2023 6:0... drwxr-xr-x   admin admin
5 files and 12 directories. Total size: 6,997 bytes
```



sftp://admin@192.168.207.244 - FileZilla

```
Status:    Directory listing of "/home/admin" successful
Status:    Starting upload of C:\Users\Public\Desktop\Google Chrome.lnk
Status:    File transfer successful, transferred 2,206 bytes in 1 second
Status:    Retrieving directory listing of "/home/admin"...
Status:    Listing directory /home/admin
Status:    Directory listing of "/home/admin" successful
```

Local site: C:\Users\Public\Desktop\

Remote site: /home/admin

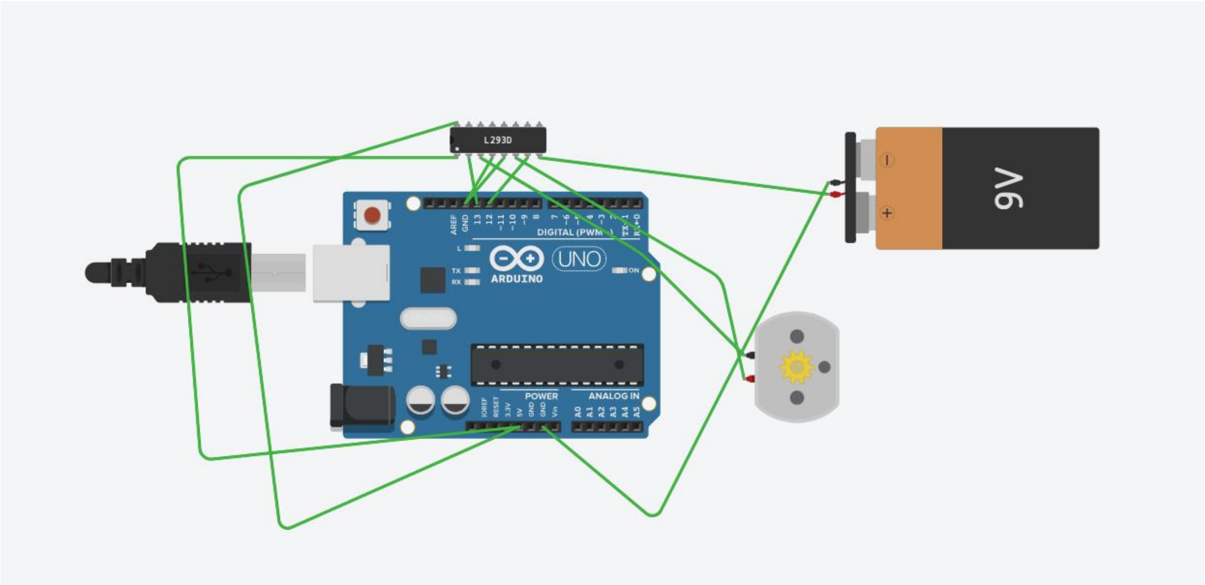
```
Filename                       Filesize  Filetype             Last modified
desktop.ini                         174  Configuration setti... 09-04-2023 3:54:40...
eLecta Live Screen Record...      2,757  Shortcut             24-04-2023 4:03:09...
Google Chrome.lnk                 2,206  Shortcut             05-05-2023 8:17:40...
Microsoft Edge.lnk                2,276  Shortcut             24-04-2023 4:11:43...
VLC media player.lnk                539  Shortcut             24-04-2023 9:13:18...
Wondershare Filmora9.lnk          1,069  Shortcut             25-04-2023 5:46:28...
Selected 1 file. Total size: 2,206 bytes
```

```
Filename               Filesize  Filetype      Last modified      Permissions  Owner/Group
Templates                        File folder   03-05-2023 6:0...  drwxr-xr-x   admin admin
Videos                           File folder   03-05-2023 6:0...  drwxr-xr-x   admin admin
.bash_logout                220  BASH_LOG...   03-05-2023 5:3...  -rw-r--r--   admin admin
.bashrc                   3,523  BASHRC File   03-05-2023 5:3...  -rw-r--r--   admin admin
.profile                    807  PROFILE File  03-05-2023 5:3...  -rw-r--r--   admin admin
.Xauthority                  56  XAUTHORI...   03-05-2023 6:0...  -rw-------   admin admin
.xsession-errors          2,391  XSESSION-...  03-05-2023 6:0...  -rw-------   admin admin
Google Chrome.lnk         2,206  Shortcut      06-05-2023 12:...  -rw-r--r--   admin admin
Microsoft Edge.lnk        2,276  Shortcut      06-05-2023 12:...  -rw-r--r--   admin admin
Wondershare Filmora...    1,069  Shortcut      06-05-2023 12:...  -rw-r--r--   admin admin
Selected 1 file. Total size: 1,069 bytes
```

Practical No – 03

Aim: - Write a python code to test motor.

Prequest : THINKERcard make a account on tinkercad



- Arduino UNO
- L293D
- DC MOTOR
- Battery

Code:

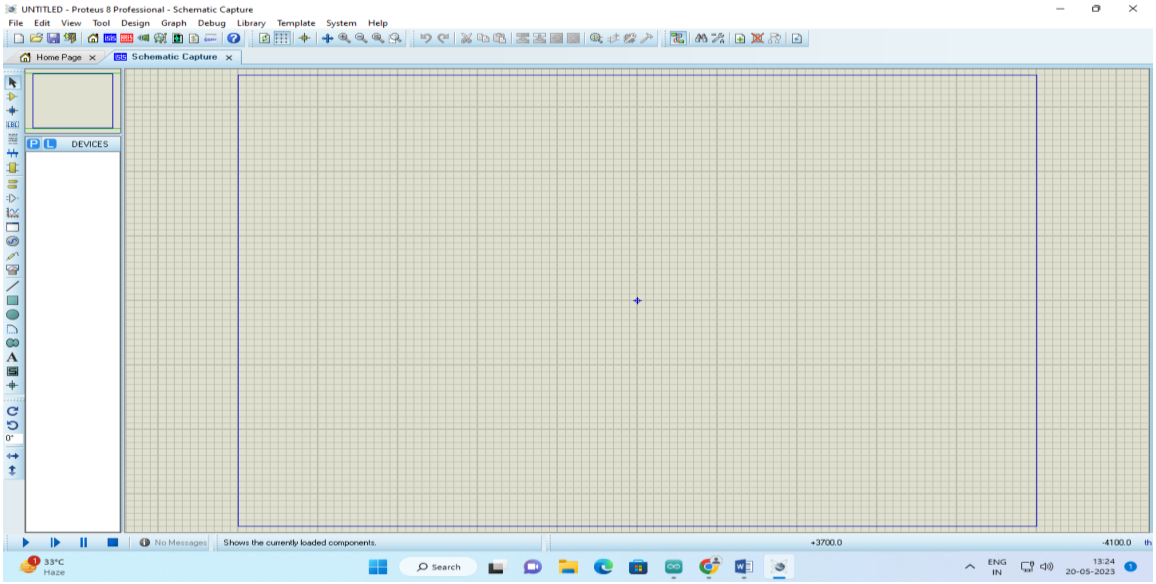
```
// C++ code
//
void setup()
{
  pinMode(LED_BUILTIN, OUTPUT);
}


void loop()
{
  digitalWrite(LED_BUILTIN, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(LED_BUILTIN, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

Practical no:- 4

Aim:-Write the script to follow the pre-determined path.

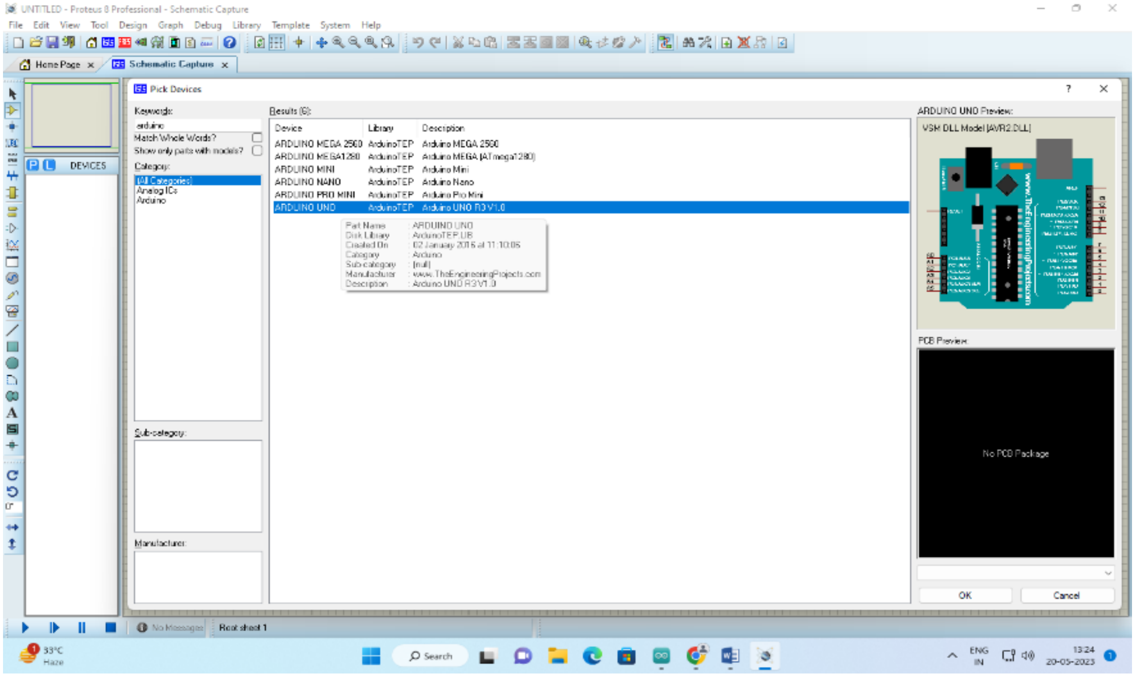
Prequest: Proteus Design Suite, Arduino IDE

Step 1) First open proteus software and select ISIS and click on it.


UNTITLED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Home Page
Schematic Capture
DEVICES
No Messages
Shows the currently loaded components.
+3700.0
-4100.0
33°C
Haze
Search
ENG
IN
13:24
20-05-2023

Step 2) Select the following components-

- Arduino UNO
- L293D
- DC MOTOR



UNTITLED - Proteus 8 Professional - Schematic Capture

Pick Devices

Keywords: arduino

Match Whole Words? □

Show only parts with models? □

Category: (All Categories), Analog ICs, Arduino

Results (6):

Device	Library	Description
ARDUINO MEGA 2560	ArduinoTEP	Arduino MEGA 2560
ARDUINO MEGA1280	ArduinoTEP	Arduino MEGA (ATmega1280)
ARDUINO MINI	ArduinoTEP	Arduino Mini
ARDUINO NANO	ArduinoTEP	Arduino Nano
ARDUINO PRO MINI	ArduinoTEP	Arduino Pro Mini
ARDUINO UNO	ArduinoTEP	Arduino UNO R3 V1.0

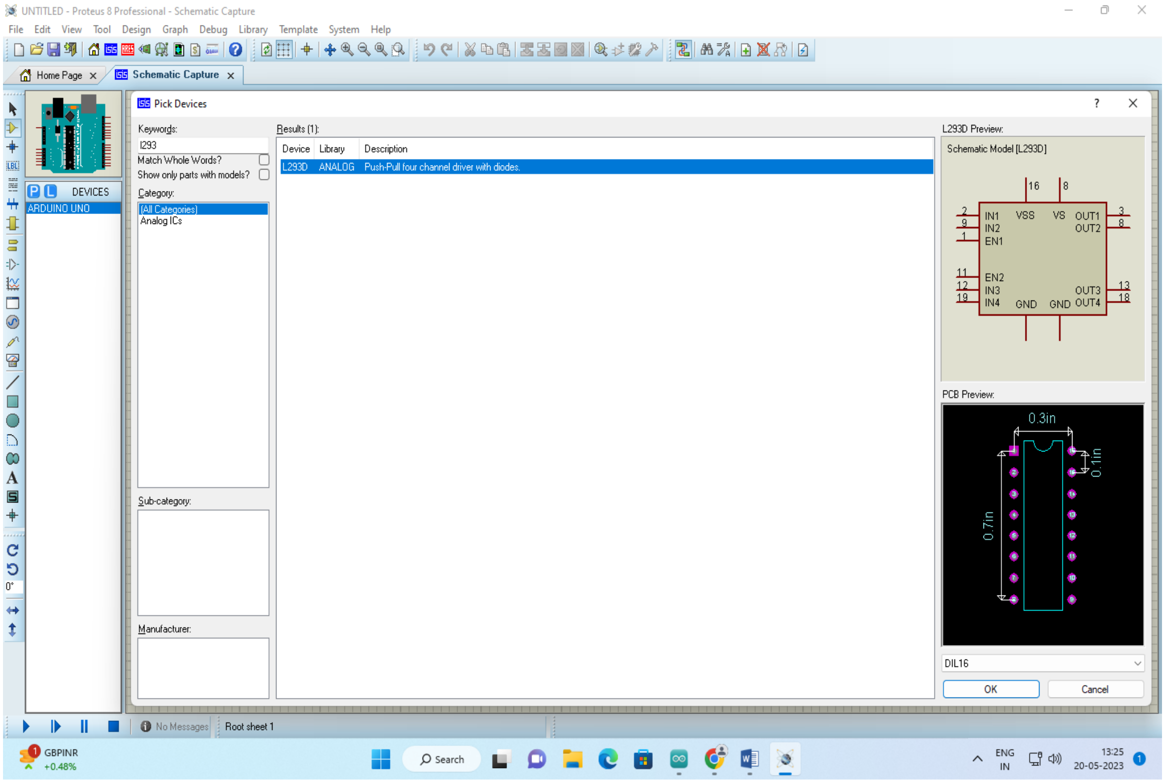
```
Part Name     : ARDUINO UNO
Disk Library  : ArduinoTEP.LIB
Created On    : 02 January 2016 at 11:10:06
Category      : Arduino
Sub-category  : [null]
Manufacturer  : www.TheEngineeringProjects.com
Description   : Arduino UNO R3 V1.0
```

ARDUINO UNO Preview:

VSM DLL Model [AVR2.DLL]

PCB Preview

No PCB Package



UNTITLED - Proteus 8 Professional - Schematic Capture

Pick Devices

Keywords: l293

Match Whole Words? □

Show only parts with models? □

Category: (All Categories), Analog ICs

Results (1):

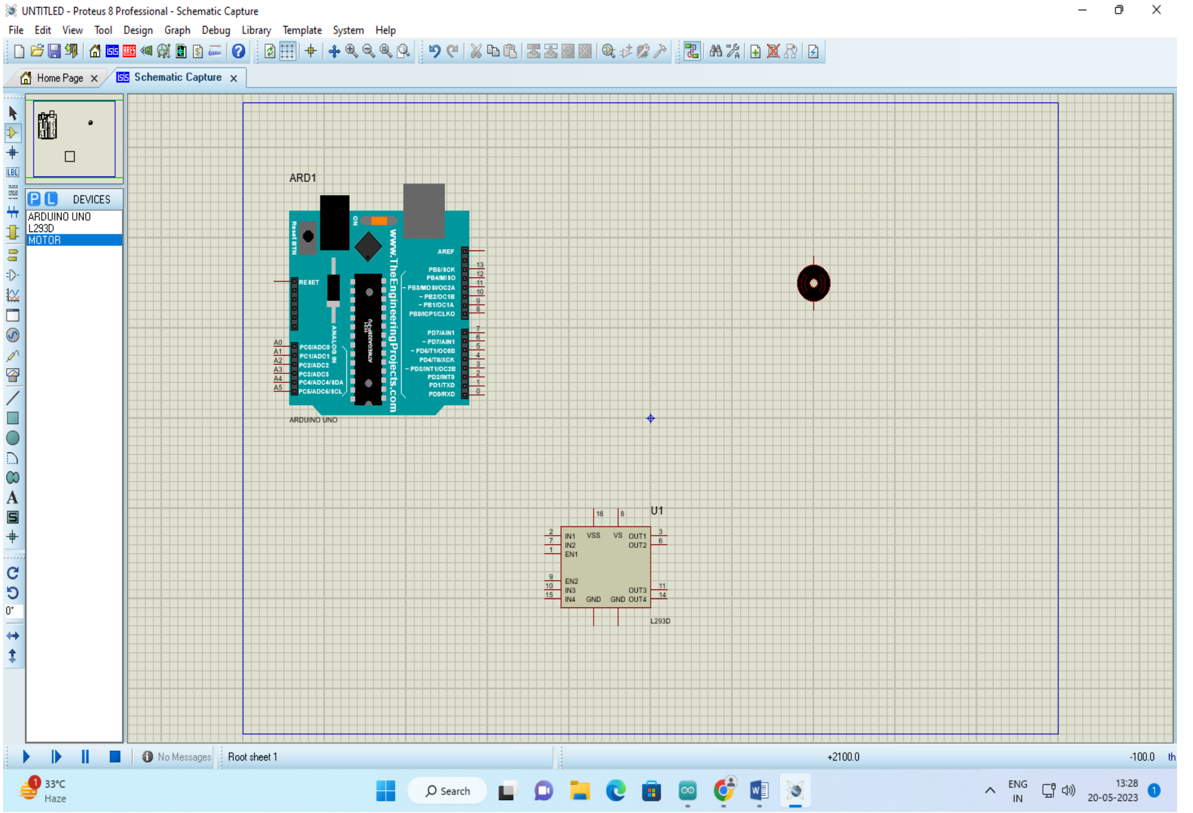
Device	Library	Description
L293D	ANALOG	Push-Pull four channel driver with diodes.

L293D Preview:

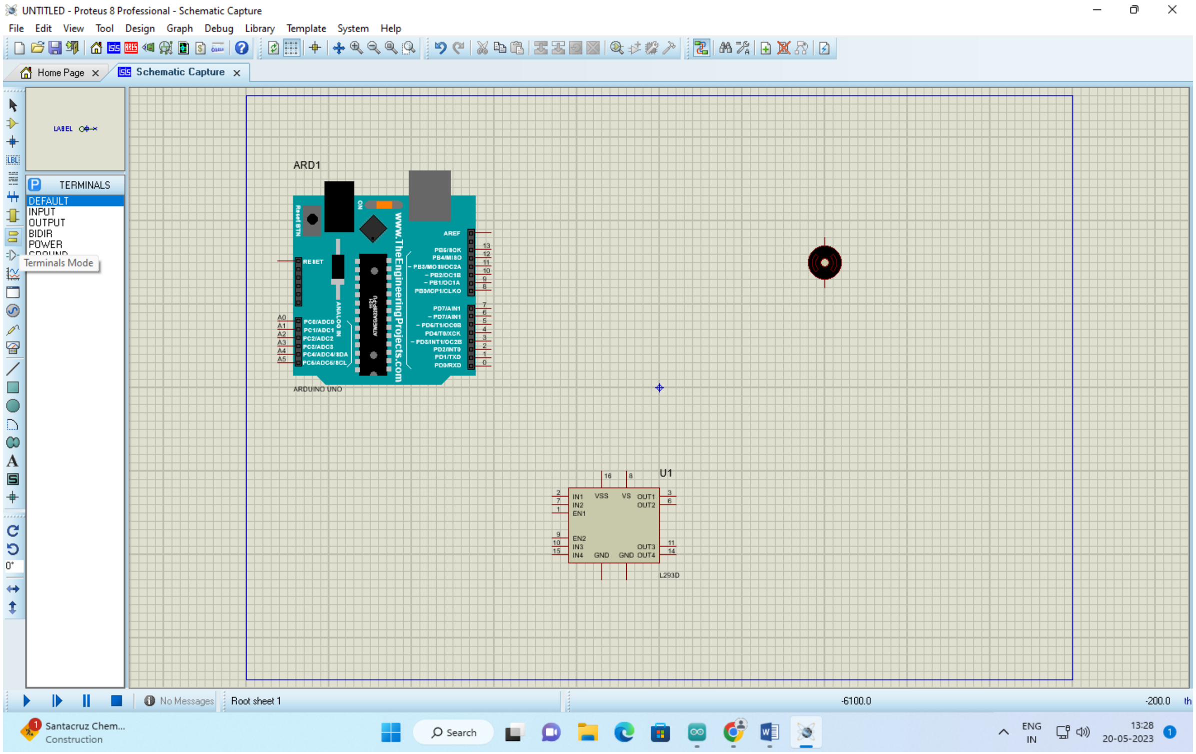
Schematic Model [L293D]

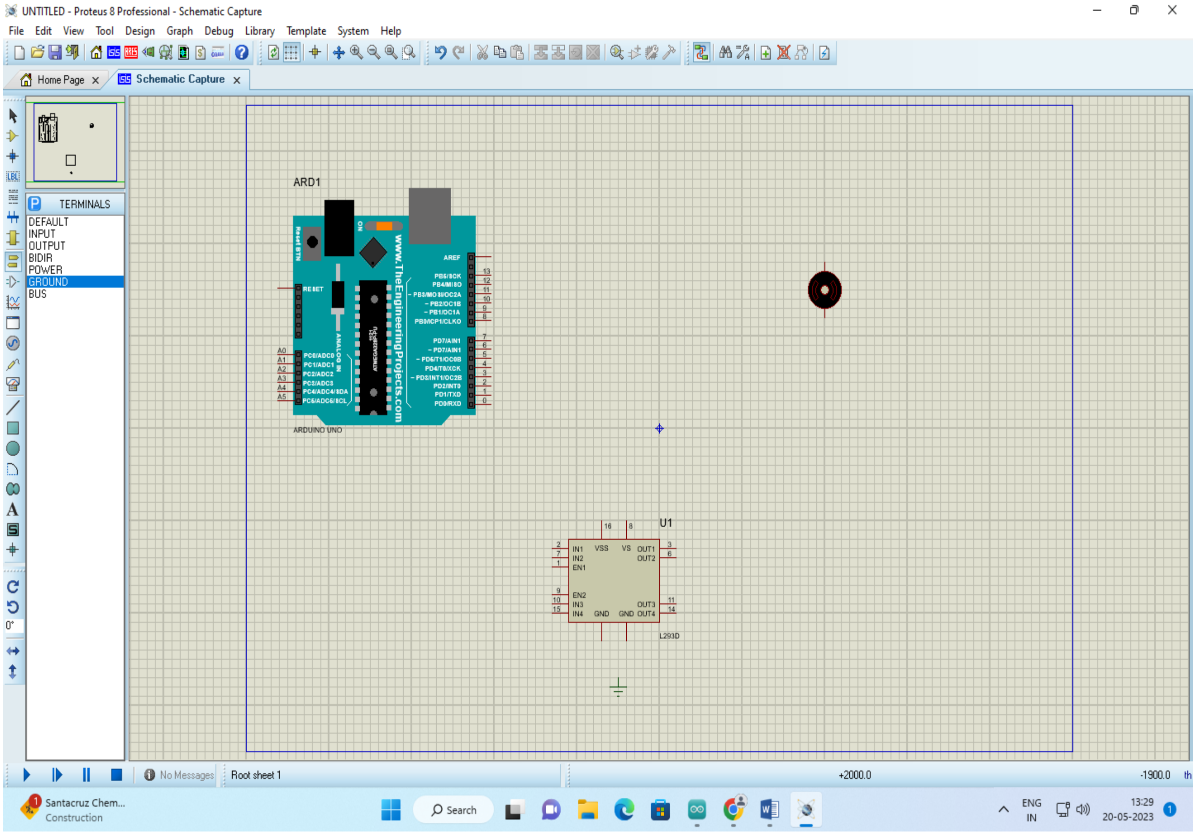
PCB Preview:

DIL16

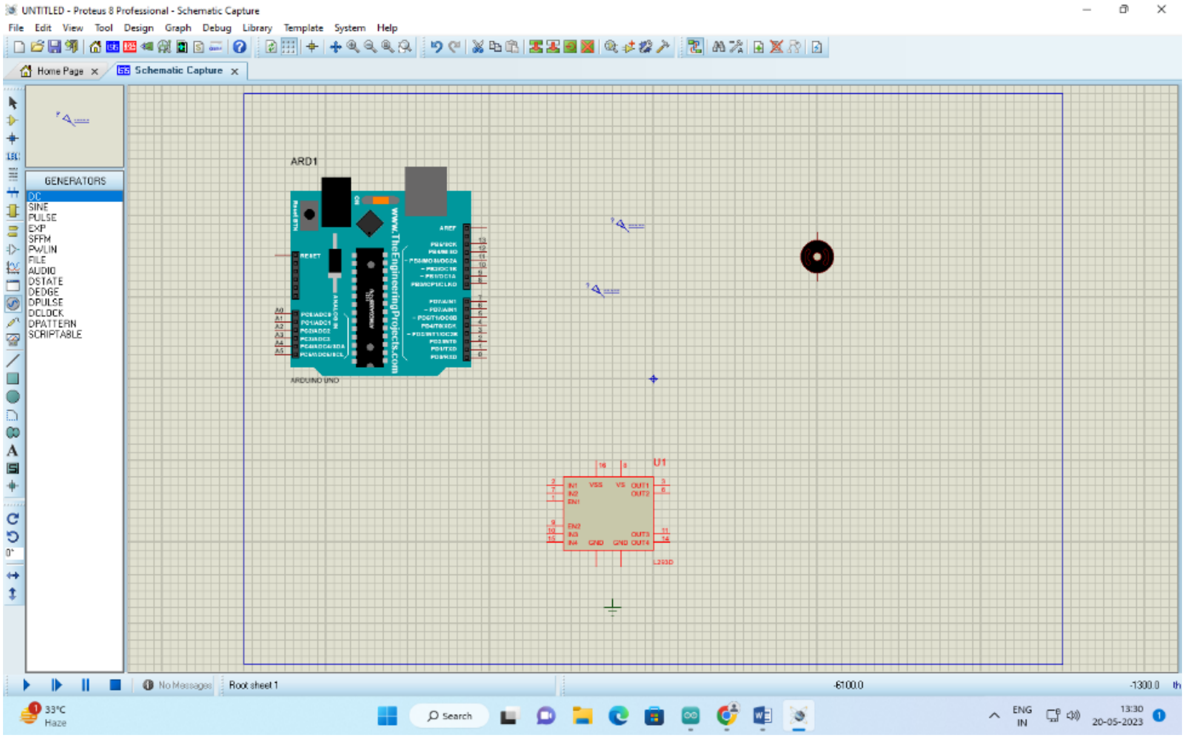

UNTITLED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Home Page
Schematic Capture
DEVICES
ARDUINO UNO
L293D
MOTOR
ARD1
ARDUINO UNO
U1
L293D
No Messages
Root sheet 1
+2100.0
-100.0

3)Select terminal and choose ground.

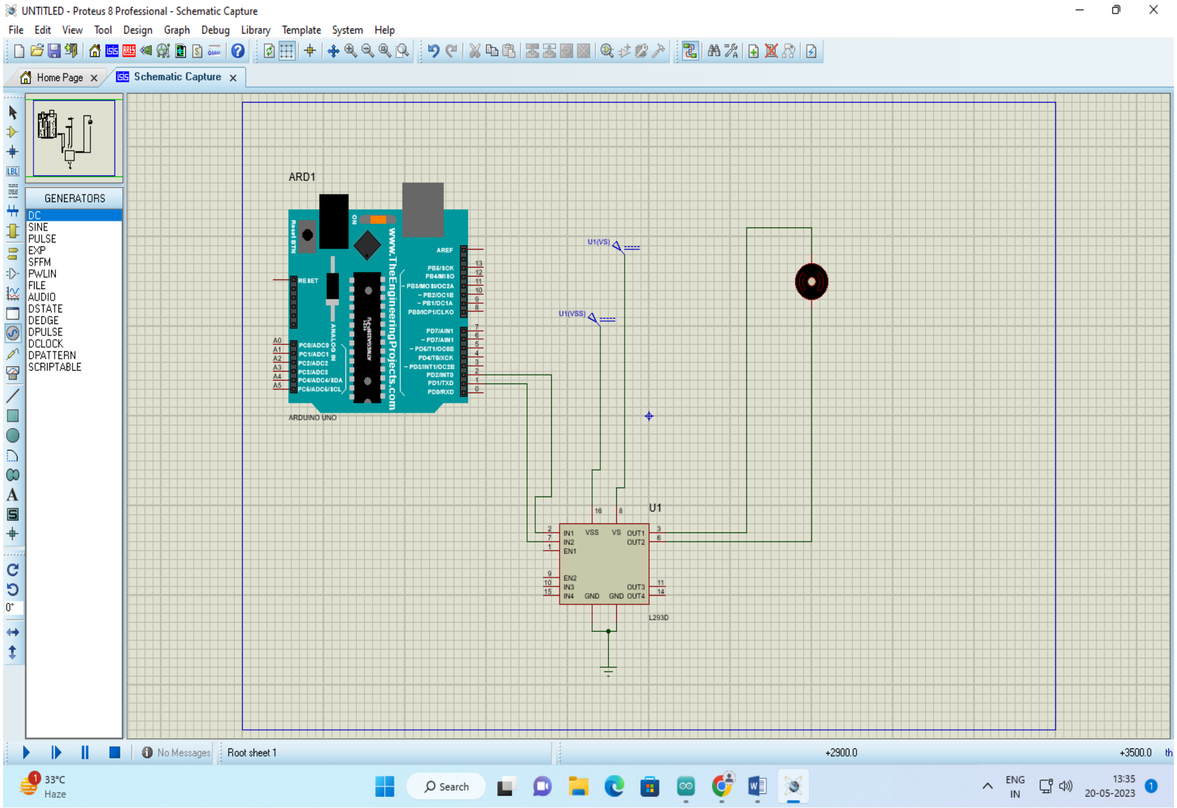




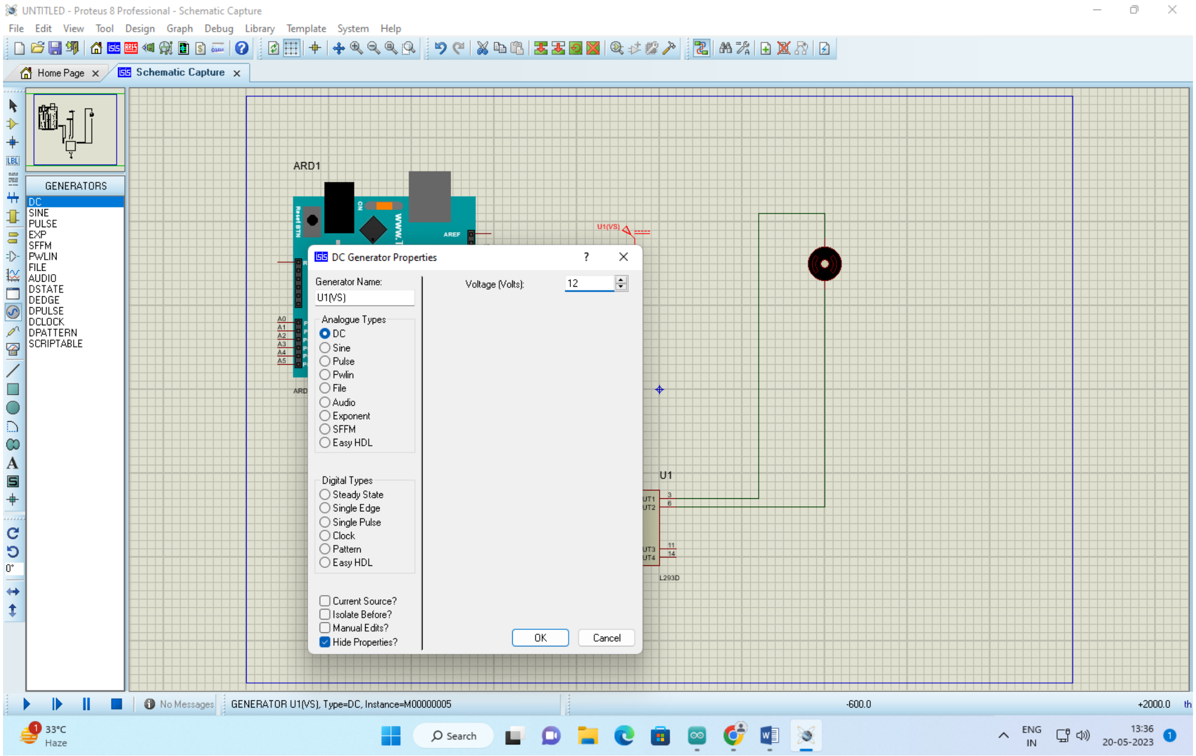
4)Select generators as DC



CONNECTION



DC generators properties


DC Generator Properties

Generator Name: U1(VS)

Voltage (Volts): 12

Analogue Types

- ● DC
- ○ Sine
- ○ Pulse
- ○ Pwlin
- ○ File
- ○ Audio
- ○ Exponent
- ○ SFFM
- ○ Easy HDL

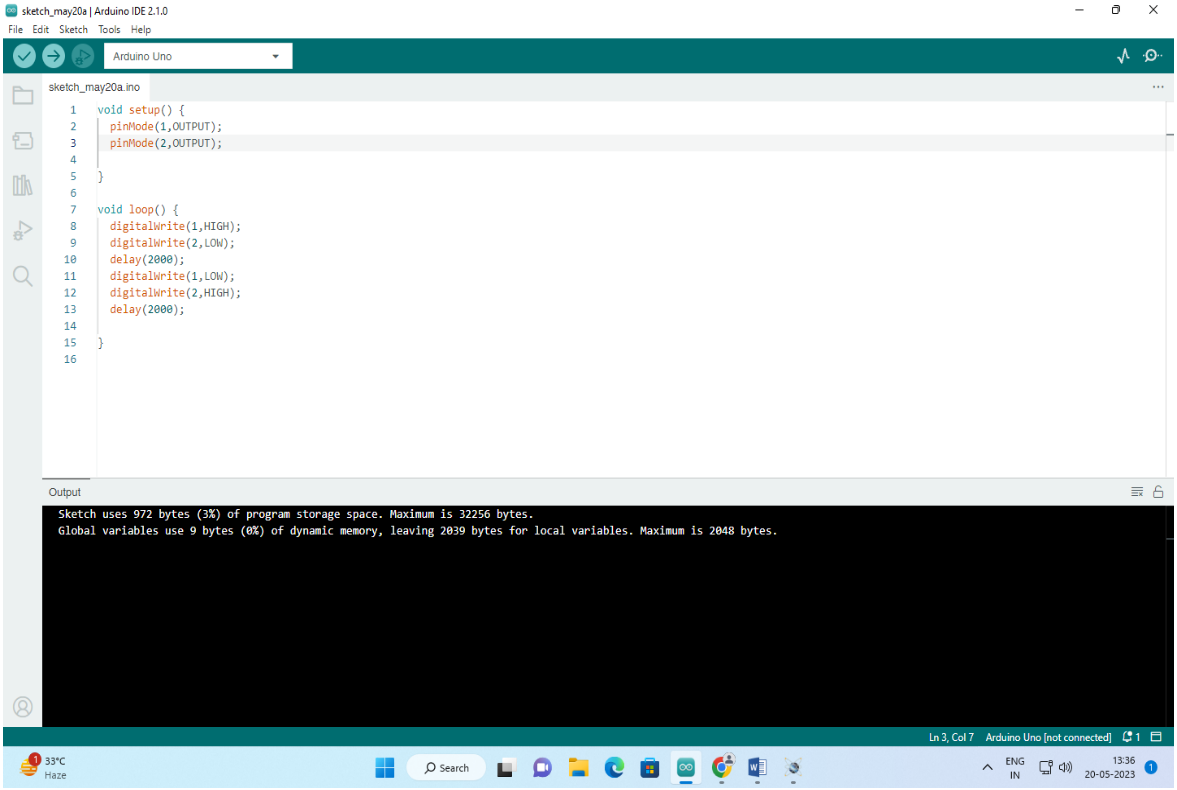
Digital Types

- ○ Steady State
- ○ Single Edge
- ○ Single Pulse
- ○ Clock
- ○ Pattern
- ○ Easy HDL

- □ Current Source?
- □ Isolate Before?
- □ Manual Edits?
- ☑ Hide Properties?

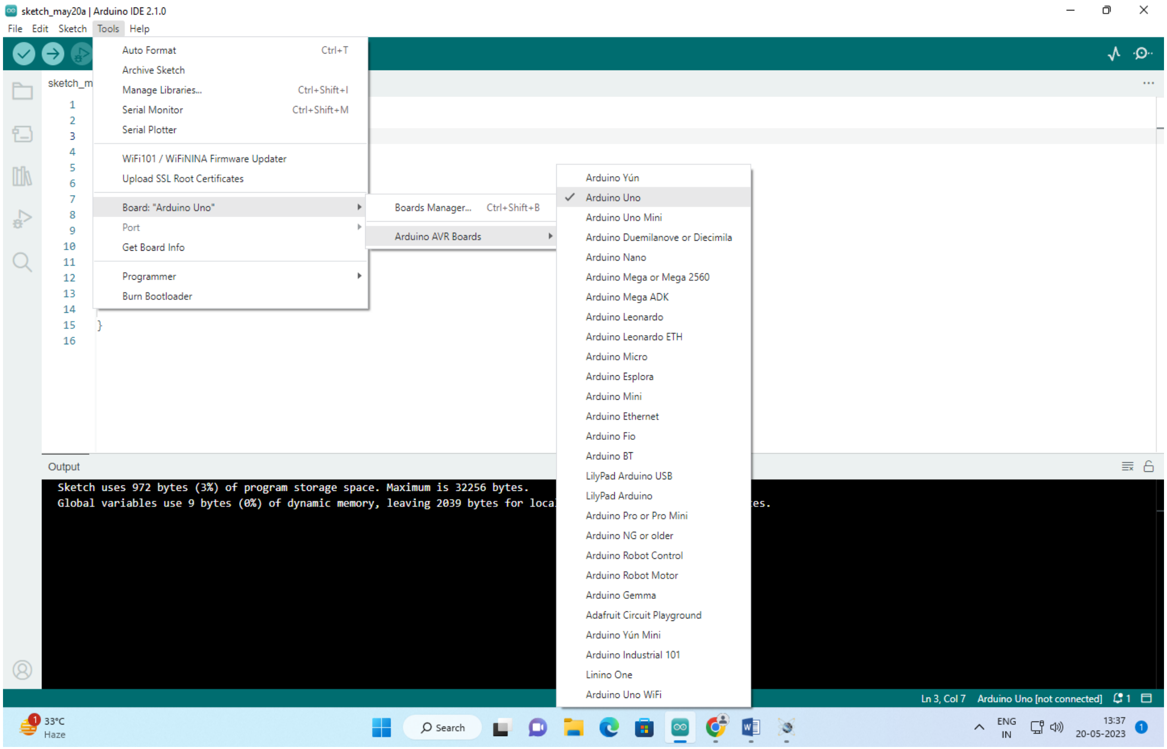
GENERATOR U1(VS), Type=DC, Instance=M00000005

Write code on Arduino


sketch_may20a | Arduino IDE 2.1.0
File Edit Sketch Tools Help
Arduino Uno
sketch_may20a.ino
Output
Ln 3, Col 7 Arduino Uno [not connected] 1
33°C
Haze
Search
ENG
IN
13:36
20-05-2023

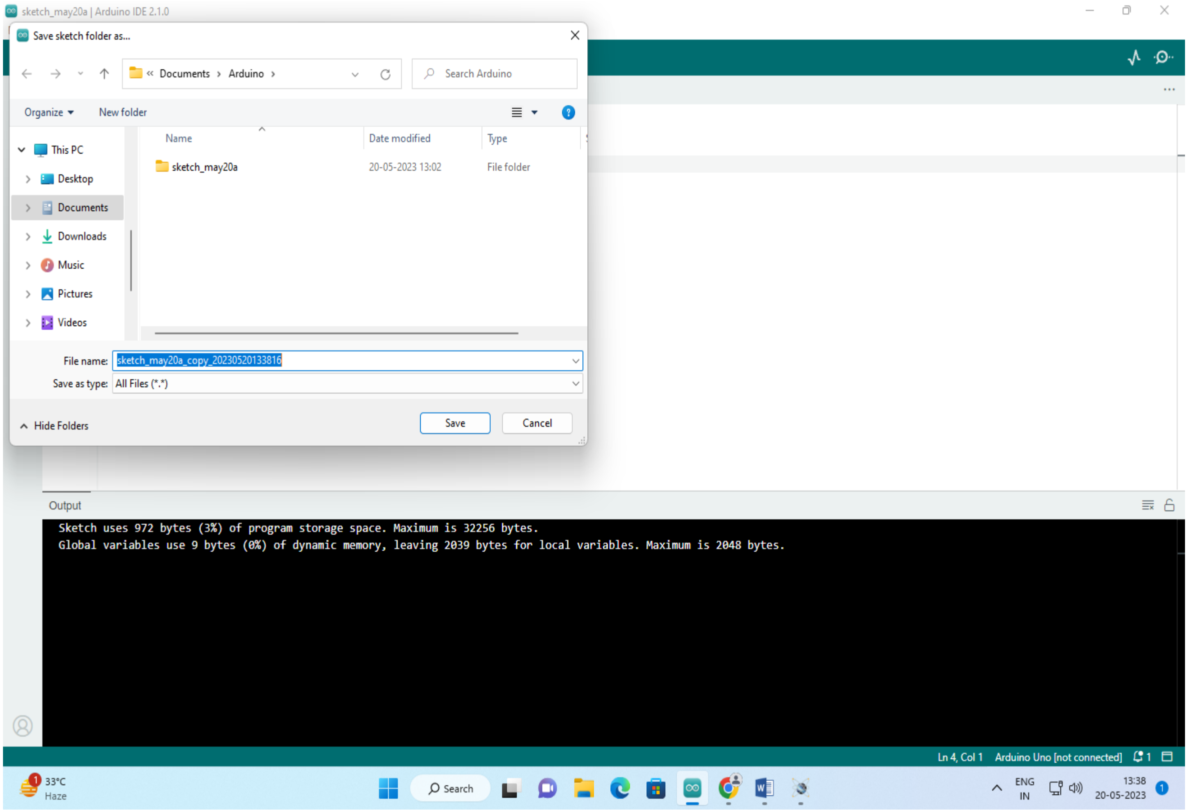
```
void setup() {
  pinMode(1,OUTPUT);
  pinMode(2,OUTPUT);

}

void loop() {
  digitalWrite(1,HIGH);
  digitalWrite(2,LOW);
  delay(2000);
  digitalWrite(1,LOW);
  digitalWrite(2,HIGH);
  delay(2000);

}
```

```
Sketch uses 972 bytes (3%) of program storage space. Maximum is 32256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for local variables. Maximum is 2048 bytes.
```



```
Sketch uses 972 bytes (3%) of program storage space. Maximum is 32256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for loca                          es.
```

Save file



sketch_may20a | Arduino IDE 2.1.0

Save sketch folder as...

Documents › Arduino ›

Name	Date modified	Type
sketch_may20a	20-05-2023 13:02	File folder

File name: sketch_may20a_copy_20230520133816

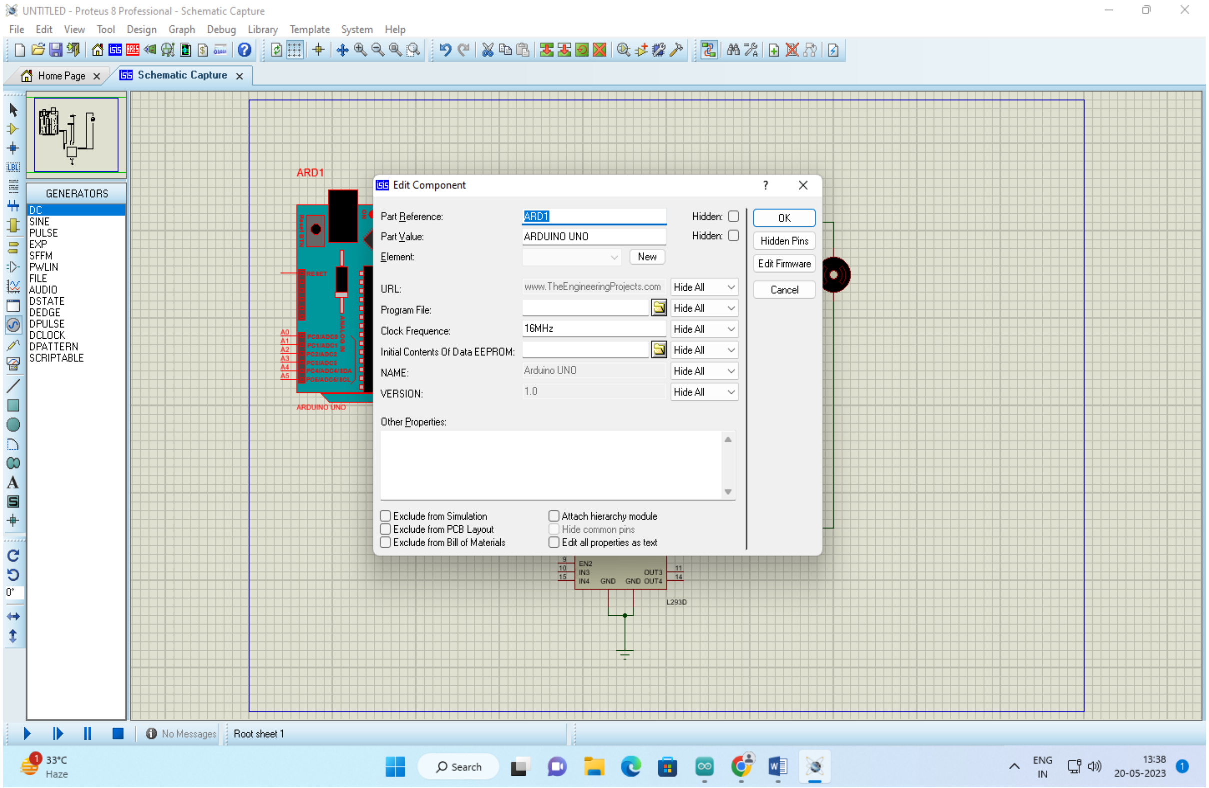
Save as type: All Files (*.*)

Output

```
Sketch uses 972 bytes (3%) of program storage space. Maximum is 32256 bytes.
Global variables use 9 bytes (0%) of dynamic memory, leaving 2039 bytes for local variables. Maximum is 2048 bytes.
```

Ln 4, Col 1   Arduino Uno [not connected]

Double click on Arduino and select the path Arduino hex file.



UNTITLED - Proteus 8 Professional - Schematic Capture

Edit Component

Part Reference: ARD1   Hidden: □

Part Value: ARDUINO UNO   Hidden: □

Element:

URL: www.TheEngineeringProjects.com   Hide All

Program File: Hide All

Clock Frequence: 16MHz   Hide All

Initial Contents Of Data EEPROM: Hide All

NAME: Arduino UNO   Hide All

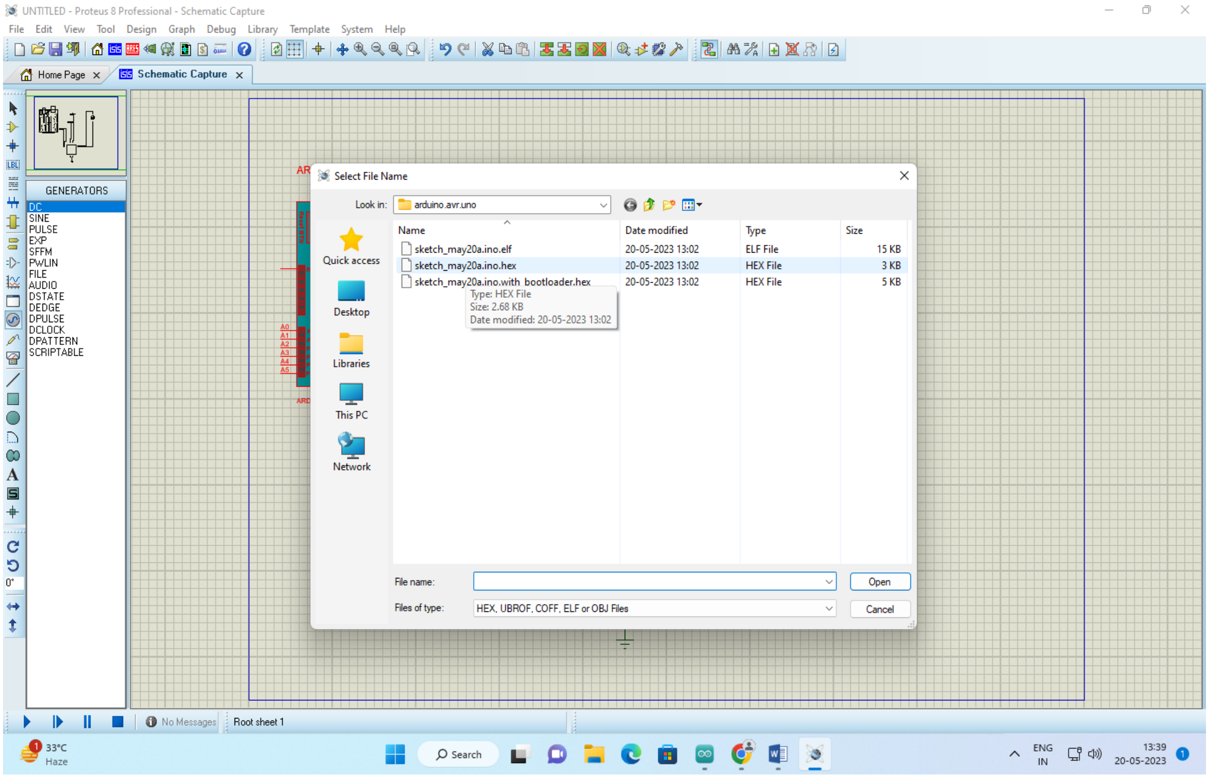
VERSION: 1.0   Hide All

Other Properties:

□ Exclude from Simulation   □ Attach hierarchy module

□ Exclude from PCB Layout   □ Hide common pins

□ Exclude from Bill of Materials   □ Edit all properties as text



Select File Name

Look in: arduino.avr.uno

Quick access
Desktop
Libraries
This PC
Network

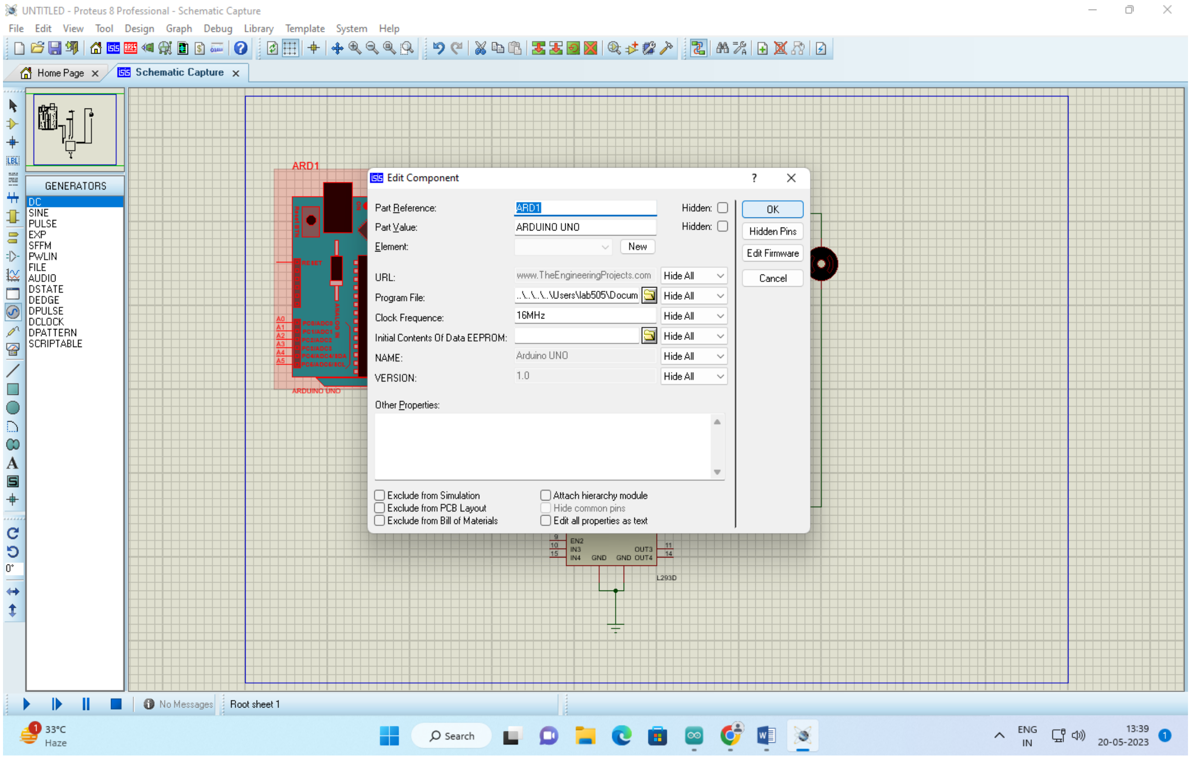
Name	Date modified	Type	Size
sketch_may20a.ino.elf	20-05-2023 13:02	ELF File	15 KB
sketch_may20a.ino.hex	20-05-2023 13:02	HEX File	3 KB
sketch_may20a.ino.with_bootloader.hex	20-05-2023 13:02	HEX File	5 KB

Type: HEX File
Size: 2.68 KB
Date modified: 20-05-2023 13:02

File name:
Files of type: HEX, UBROF, COFF, ELF or OBJ Files

Open
Cancel

After selecting the path click on “ok”


UNTITLED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Home Page
Schematic Capture
GENERATORS
ARD1
EN2
IN3
IN4
GND
GND
OUT3
OUT4
L293D
No Messages
Root sheet 1

Edit Component

Part Reference: ARD1 Hidden: □
Part Value: ARDUINO UNO Hidden: □
Element: New

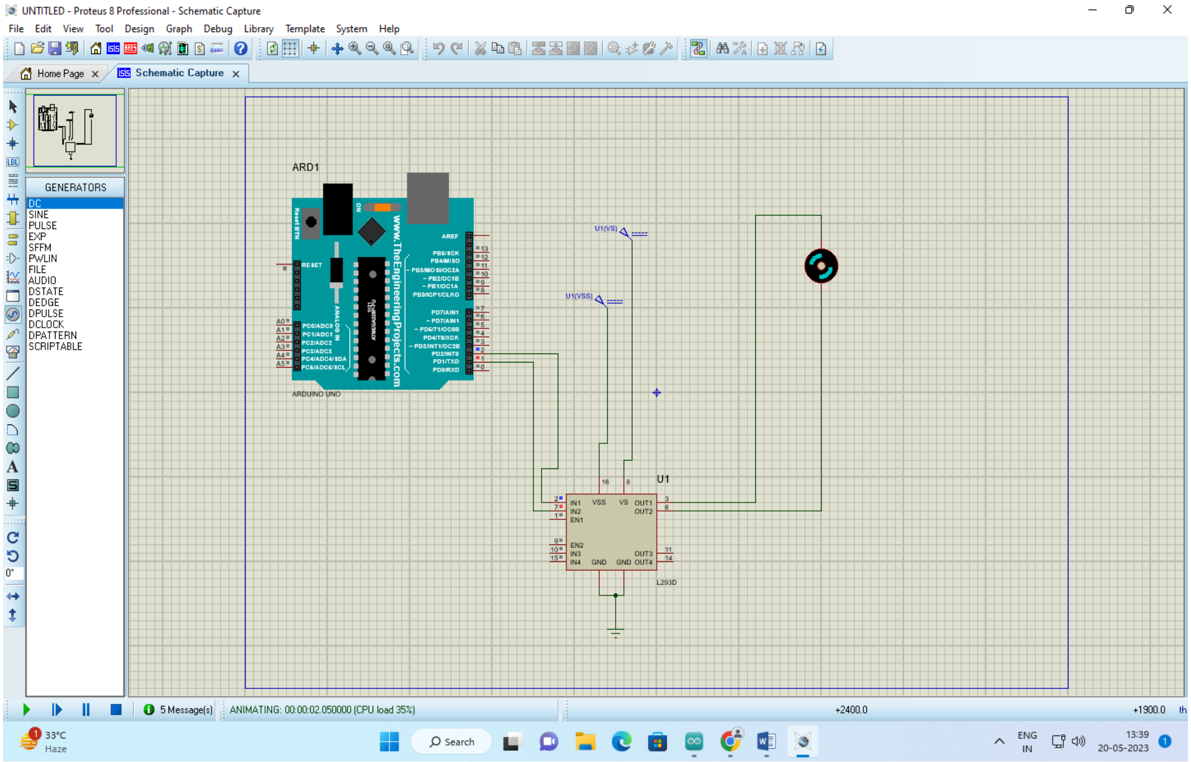
URL: www.TheEngineeringProjects.com Hide All
Program File: ..\..\..\..\Users\lab505\Docum Hide All
Clock Frequence: 16MHz Hide All
Initial Contents Of Data EEPROM: Hide All
NAME: Arduino UNO Hide All
VERSION: 1.0 Hide All

Other Properties:

□ Exclude from Simulation
□ Exclude from PCB Layout
□ Exclude from Bill of Materials
□ Attach hierarchy module
□ Hide common pins
□ Edit all properties as text

OK
Hidden Pins
Edit Firmware
Cancel

Click on run and you will see the o/p:-



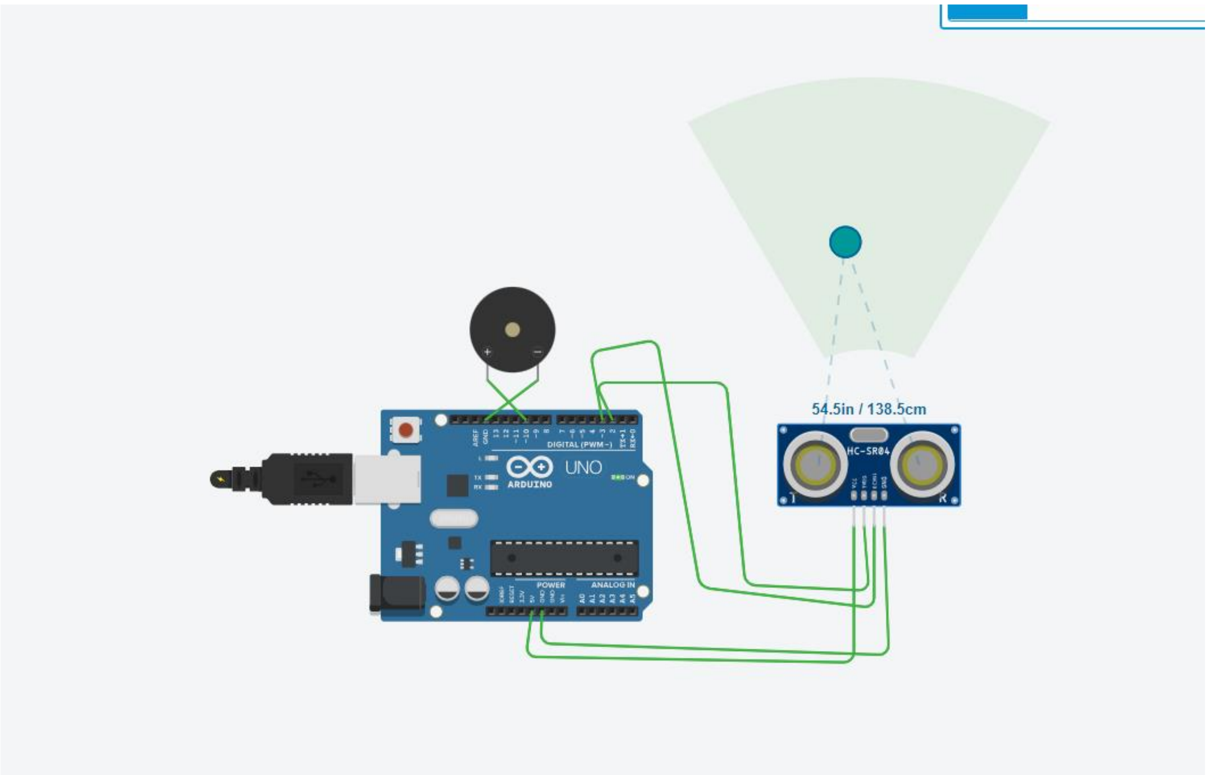
5 Message(s)

ANIMATING: 00:00:02.050000 (CPU load 35%)

Practical no:- 5

Aim: Develop Python code for testing the sensors

Prequest : THINKERcard make a account on tinkercad



- Arduino UNO
- Ultrasonic distance sensor
- Piezo

Code:

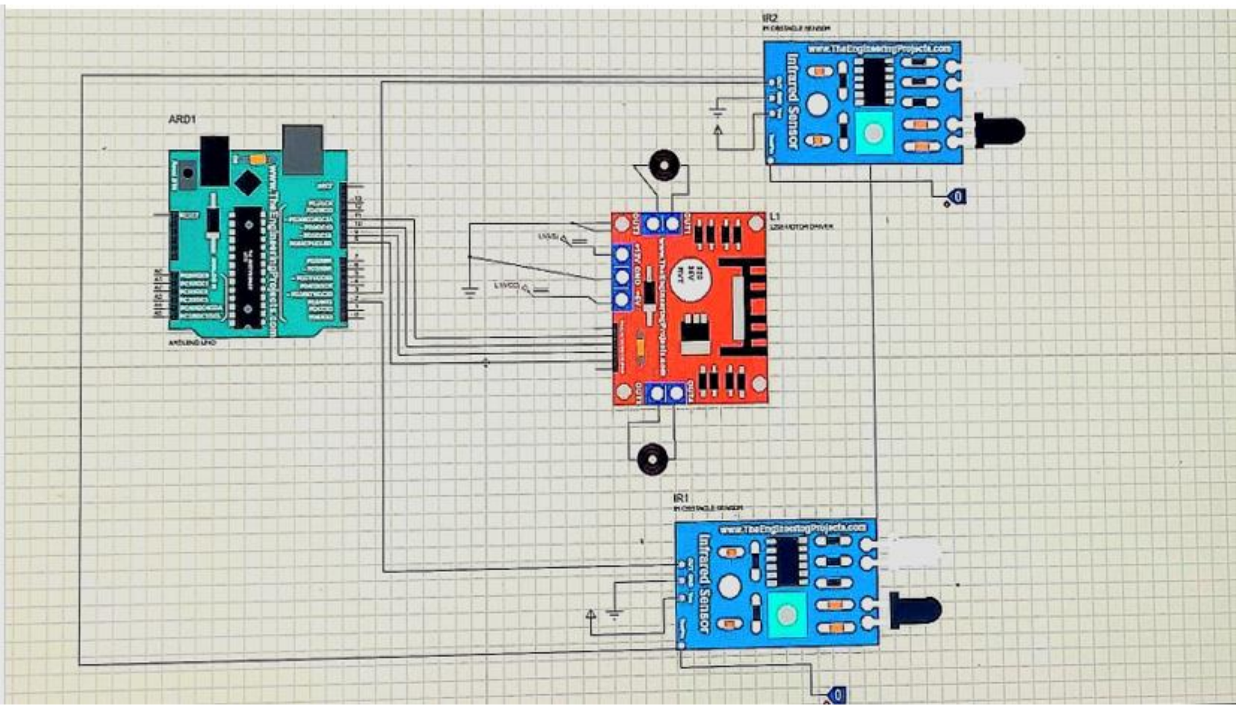
```
int trigger_pin = 2;
int echo_pin = 3;
int buzzer_pin = 10;
int time;
int distance;
void setup()
{
    Serial.begin(9600);
    pinMode (trigger_pin, OUTPUT);
    pinMode (echo_pin, INPUT);
    pinMode (buzzer_pin, OUTPUT);
}
void loop()
{
    digitalWrite (trigger_pin,HIGH);
    delayMicroseconds (10);
    digitalWrite (trigger_pin, LOW);
    time = pulseIn (echo_pin, HIGH);
    distance = (time * 0.034)/2;

 if (distance <= 10)
 {
  Serial.println("Door Open");
  Serial.print ("Distance=");
```

```
    Serial.println (distance);
    digitalWrite (buzzer_pin, HIGH);
    delay (500);
  }
  else
    {
    Serial.println("Door Close");
    Serial.print ("Distance=");
    Serial.println (distance);
    digitalWrite (buzzer_pin, LOW);
    delay (500);
  }
}
```

Practical no:- 6

Aim: Add the sensors to the Robot object and develop the line-following behavior code

Prequest: Proteus Design Suite, Arduino IDE



- Arduino UNO
- L298 Motor Driver
- DC MOTOR
- IR OBSTACLE SENSOR

Code:

```
int IR1 = 2;
int IR2 = 3;
int mt1f = 9;
int mt1b = 8;
int mt2f = 10;
int mt2b = 11;
void setup() {
  // put your setup code here, to run once:

  pinMode(IR1, INPUT);
  pinMode(IR2, INPUT);

  pinMode(mt1f, OUTPUT);
  pinMode(mt1b, OUTPUT);
  pinMode(mt2f, OUTPUT);
  pinMode(mt2b, OUTPUT);
}

void loop() {
  // put your main code here, to run repeatedly:
  int st1 = digitalRead(IR1);

  int st2 = digitalRead(IR2);



  if (st1 ==1 && st2==1) {

    digitalWrite(mt1f, HIGH);
    digitalWrite(mt2f, HIGH);
  }
 else if(st1 ==0 && st2==1){

    digitalWrite(mt1b, HIGH);
    digitalWrite(mt2f, HIGH);
  }
 else if(st1 ==1 && st2==0){

    digitalWrite(mt1f, HIGH);
    digitalWrite(mt2b, HIGH);
  }
else {

    digitalWrite(mt1b, LOW);
    digitalWrite(mt2b, LOW);
  }
}
```

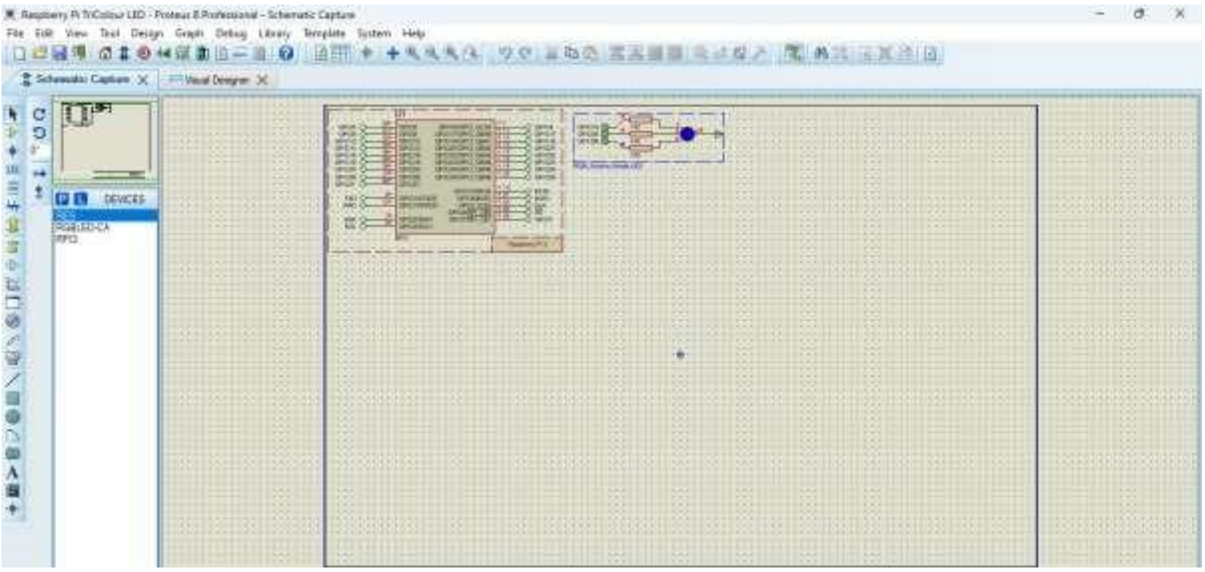
Practical no:- 7

Aim:-Using Light strip to develop and debug the line follower robot

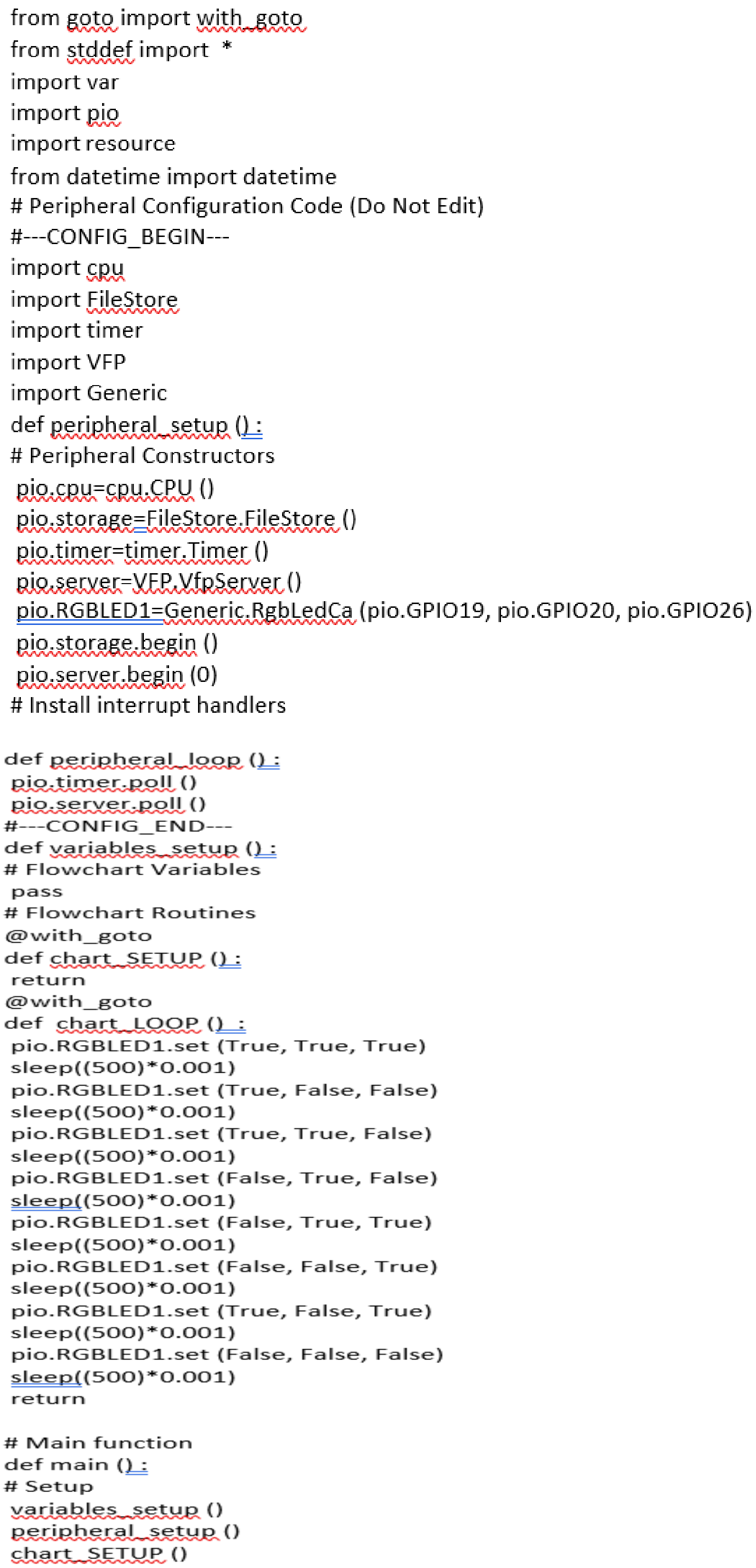
Components required:

Raspberry pr ,Strip rgb led

Circuit connection:-



Source Code in python

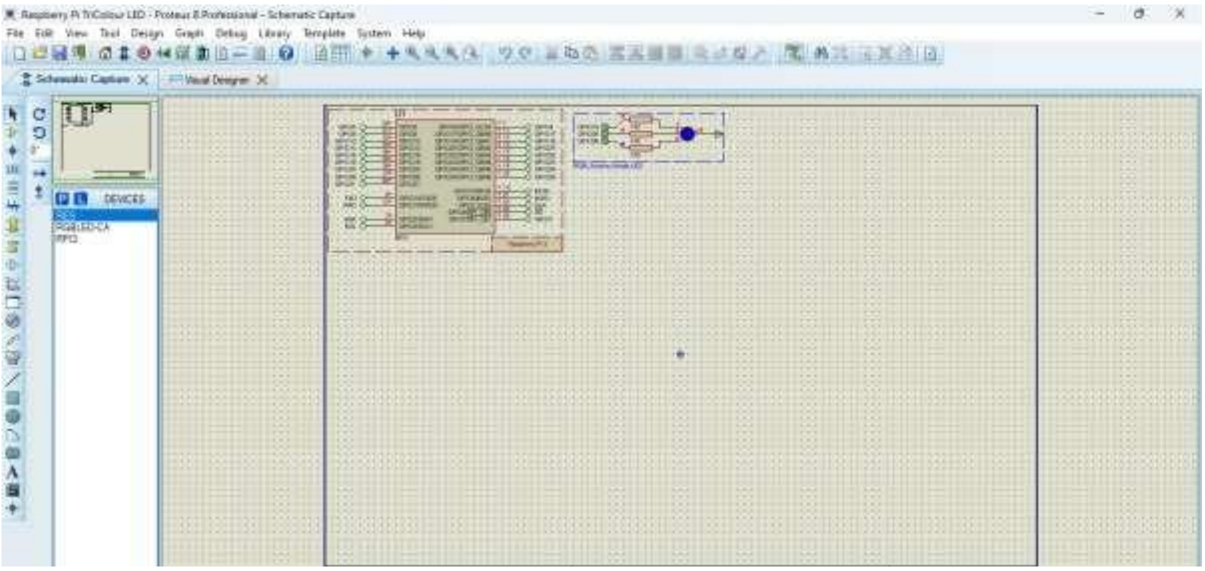


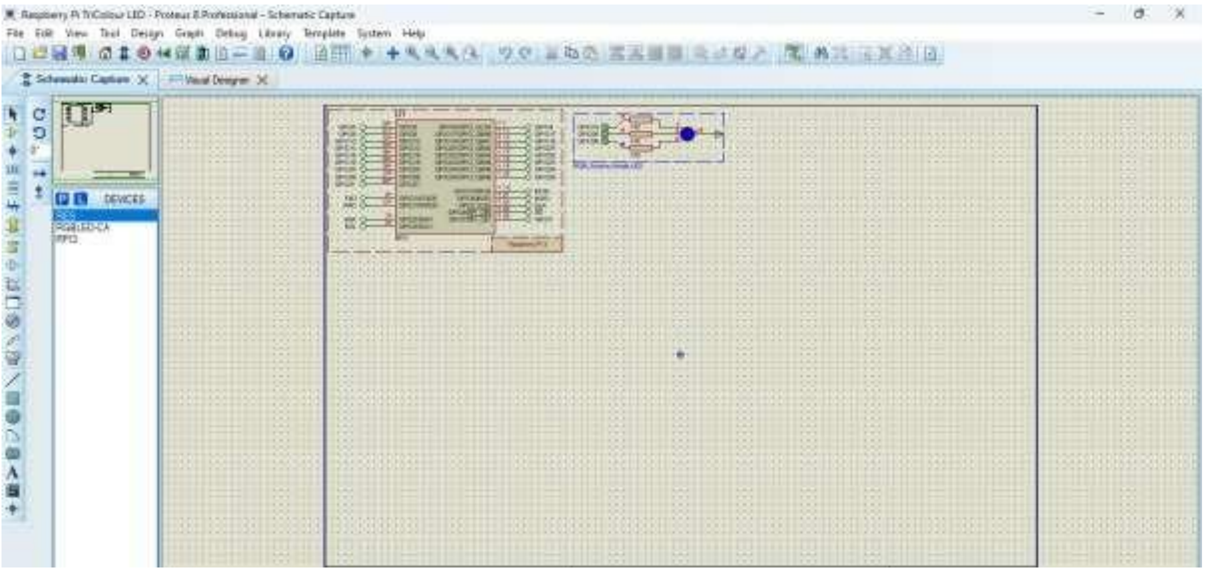
```
from goto import with_goto
from stddef import  *
import var
import pio
import resource
from datetime import datetime
# Peripheral Configuration Code (Do Not Edit)
#---CONFIG_BEGIN---
import cpu
import FileStore
import timer
import VFP
import Generic
def peripheral_setup () :
# Peripheral Constructors
 pio.cpu=cpu.CPU ()
 pio.storage=FileStore.FileStore ()
 pio.timer=timer.Timer ()
 pio.server=VFP.VfpServer ()
 pio.RGBLED1=Generic.RgbLedCa (pio.GPIO19, pio.GPIO20, pio.GPIO26)
 pio.storage.begin ()
 pio.server.begin (0)
# Install interrupt handlers

def peripheral_loop () :
 pio.timer.poll ()
 pio.server.poll ()
#---CONFIG_END---
def variables_setup () :
# Flowchart Variables
 pass
# Flowchart Routines
@with_goto
def chart_SETUP () :
 return
@with_goto
def  chart_LOOP ()  :
 pio.RGBLED1.set (True, True, True)
 sleep((500)*0.001)
 pio.RGBLED1.set (True, False, False)
 sleep((500)*0.001)
 pio.RGBLED1.set (True, True, False)
 sleep((500)*0.001)
 pio.RGBLED1.set (False, True, False)
 sleep((500)*0.001)
 pio.RGBLED1.set (False, True, True)
 sleep((500)*0.001)
 pio.RGBLED1.set (False, False, True)
 sleep((500)*0.001)
 pio.RGBLED1.set (True, False, True)
 sleep((500)*0.001)
 pio.RGBLED1.set (False, False, False)
 sleep((500)*0.001)
 return

# Main function
def main () :
# Setup
 variables_setup ()
 peripheral_setup ()
 chart_SETUP ()
```

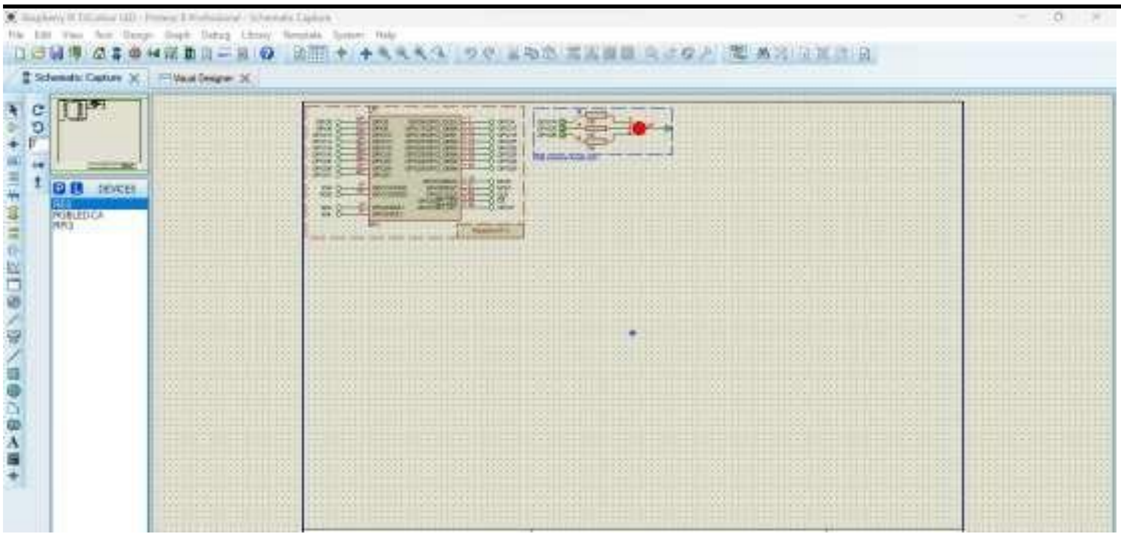
```
# Infinite loop
 while True :
 peripheral_loop ()
 chart_LOOP ()
# Command line execution
if __name___== '_main_':
   main()
```

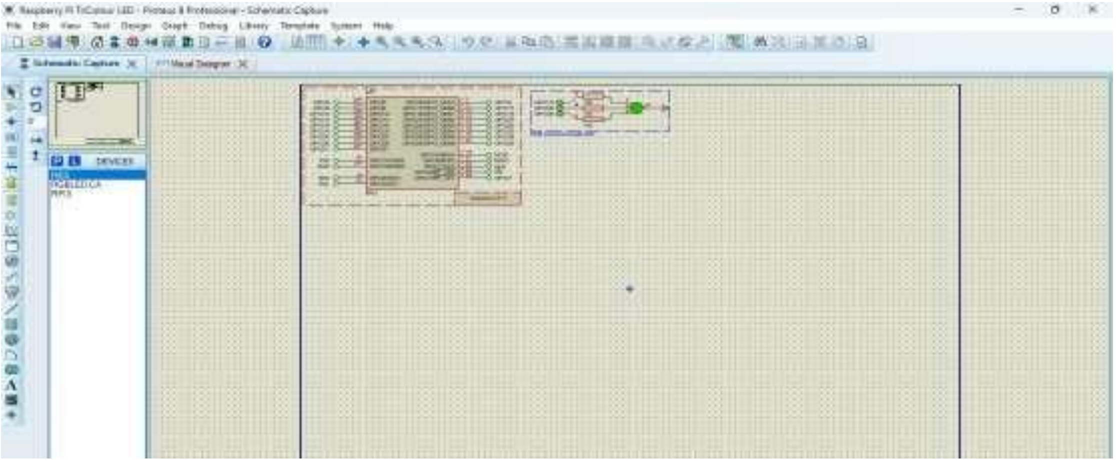
Flowchart of project:

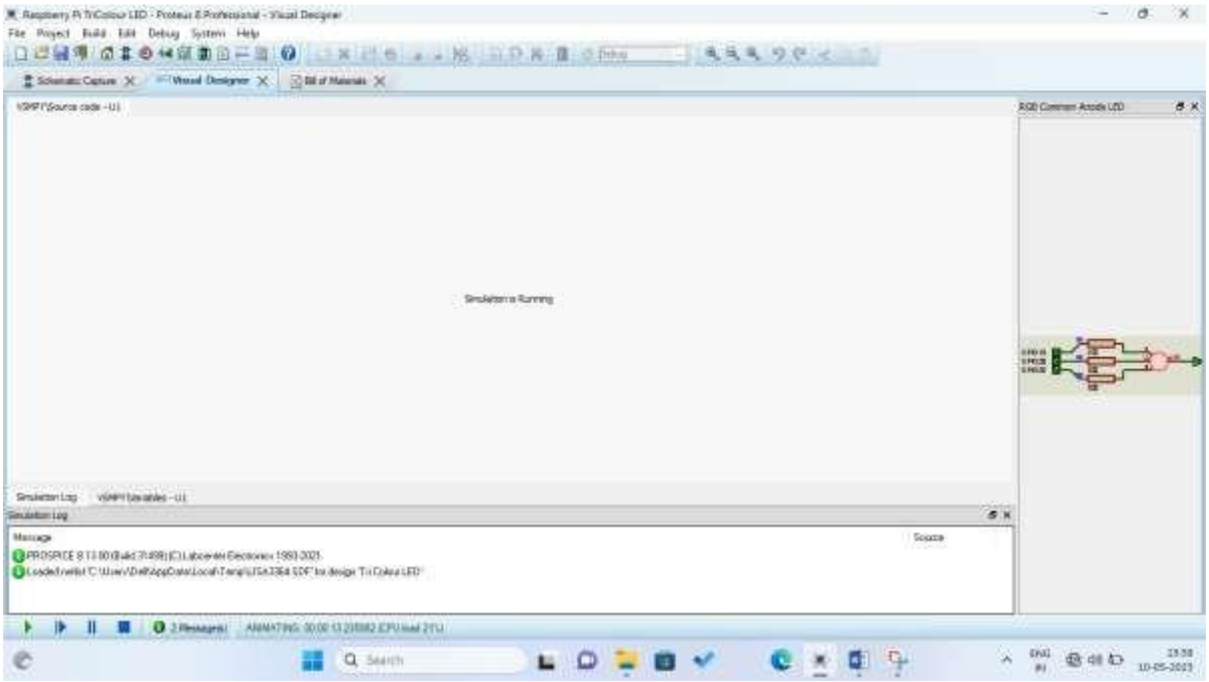
OUTPUT:-


Raspberry Pi TriColour LED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
Visual Designer
DEVICES
RGBLED-CA
RPI3


Raspberry Pi TriColour LED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
Visual Designer
DEVICES
RGBLED-CA
RPI3


Raspberry Pi TriColour LED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
Visual Designer
DEVICES

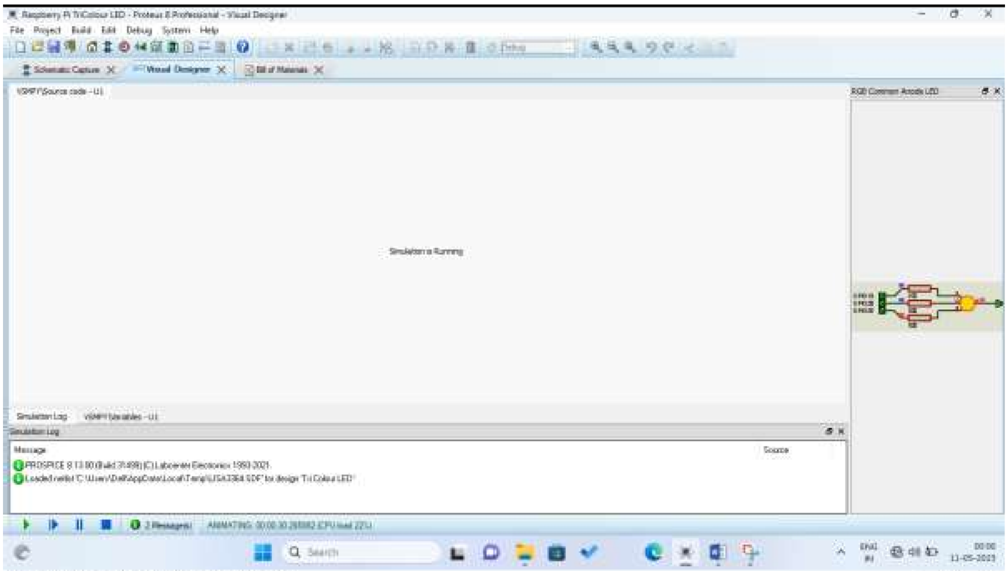

Raspberry Pi TriColour LED - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
Visual Designer
DEVICES



Simulation is Running

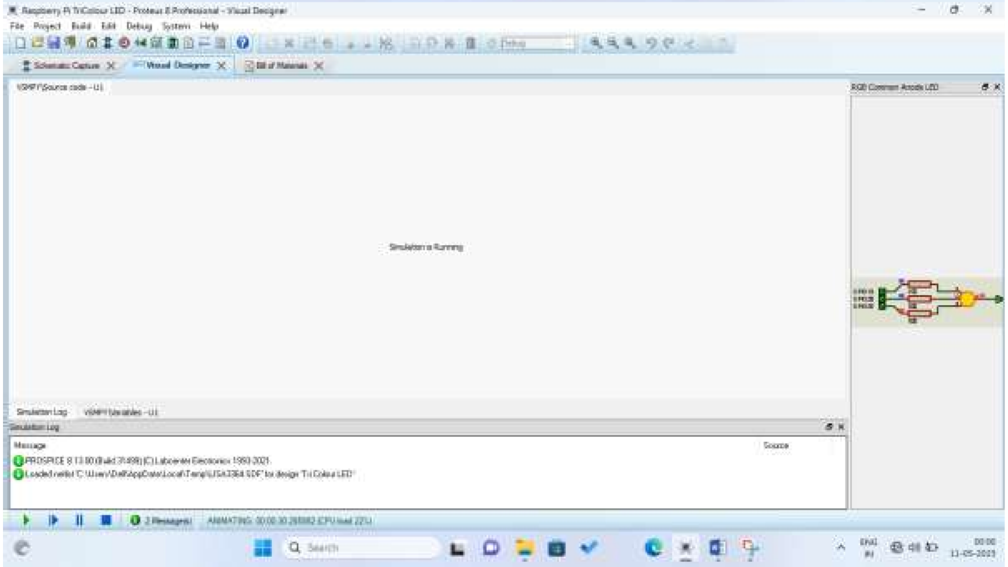
```
Simulation Log
Message                                                                                              Source
PROSPICE 8.13.00 (Build 31498) (C) Labcenter Electronics 1993-2021.
Loaded netlist 'C:\Users\Dell\AppData\Local\Temp\LISA3364.SDF' for design 'Tri Colour LED'
```

2 Message(s)   ANIMATING: 00:00:13.235882 (CPU load 21%)



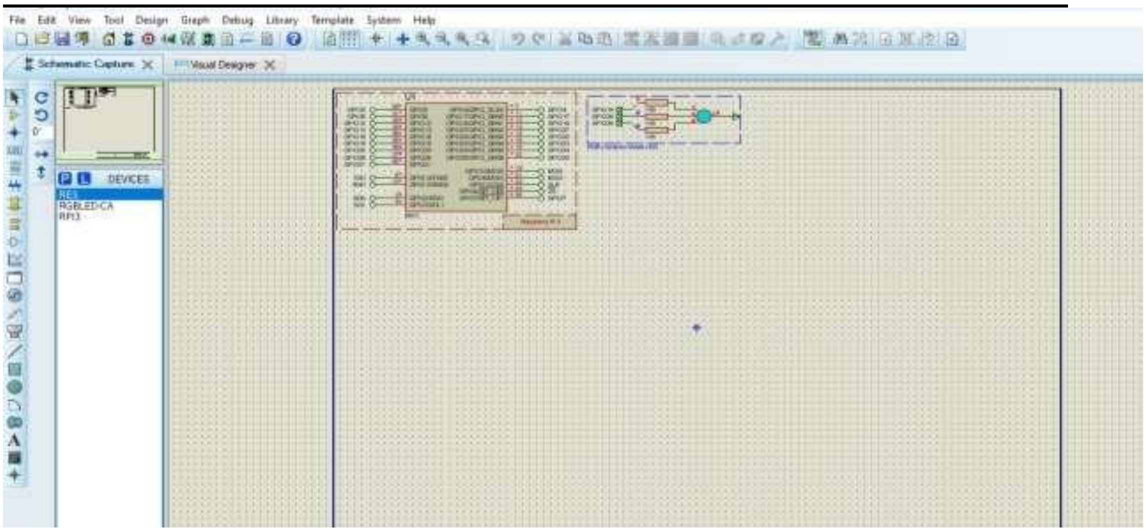
Message
PROSPICE 8.13.00 (Build 31498) (C) Labcenter Electronics 1993-2021
Loaded netlist 'C:\Users\Dell\AppData\Local\Temp\LISA3364.SDF' for design 'Tri Colour LED'

ANIMATING: 00:00:30.285982 (CPU load 22%)



Message
PROSPICE 8.13.00 (Build 31498) (C) Labcenter Electronics 1993-2021
Loaded netlist 'C:\Users\Dell\AppData\Local\Temp\LISA3364.SDF' for design 'Tri Colour LED'

ANIMATING: 00:00:30.285982 (CPU load 22%)



Conclusion:-

Hence we have programmed the rbg strip led for the observation of various colors used to identify the paths.

Practical No – 10

Aim - Detect faces with Haar cascades.

Step 1: Need to be Download “haarcascarde_frontalface_default.xml” in same folder of code file and Web cam connected to system.

Step 2: Install create and activate Virtual Environment by using venv Package.

Use below command to download virtual environment by using CMD,

```
>>>pip install venv
```

Command to Create virtual environment,

```
>>>Virtualenv env
```

Command to Activation of virtual environment,

For Linux: $sources environment_name/bin/activate

For Windows: >env\scripts\activate

Step 3: Install Open CV Package,

```
>>>pip install opencv-python
```

Step 4: Use any Editor for code writing (e.g: VS Code, Python IDLE)

For open VS code type in same CMD shell,

```
>>>code .
```

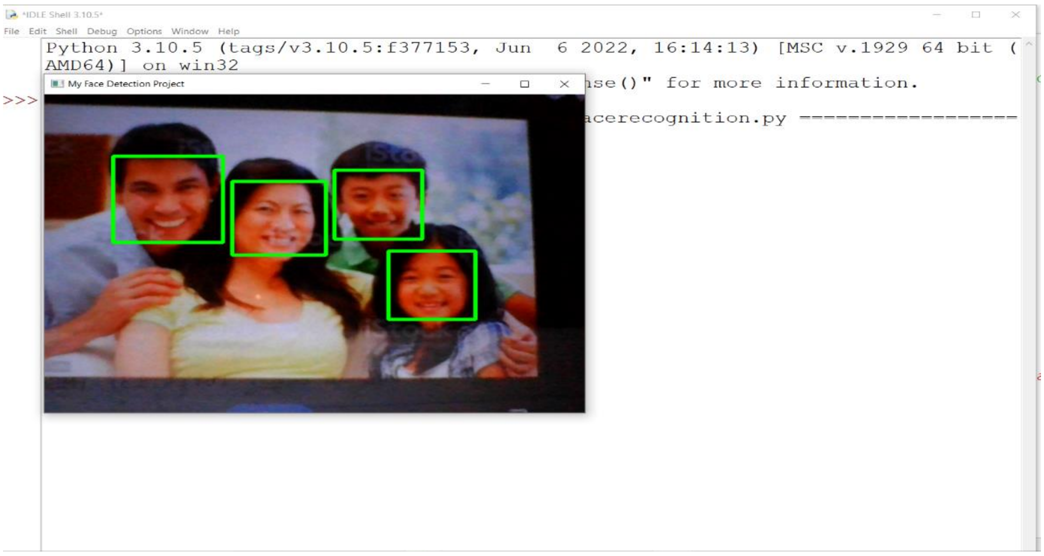
Step 5: For running program here we used VS Code, Write below code and run.

Source Code:

```
import cv2
```

```
face_classifier = cv2.CascadeClassifier(cv2.data.haarcascades
+ "haarcascade_frontalface_default.xml")

video_capture = cv2.VideoCapture(0)

def detect_bounding_box(vid):
    gray_image = cv2.cvtColor(vid, cv2.COLOR_BGR2GRAY)
    faces = face_classifier.detectMultiScale(gray_image, 1.1, 5,
minSize=(40,40))
    for (x,y,w,h) in faces:
        cv2.rectangle(vid, (x,y),(x+w,y+h),(0,255,0),4)
    return faces

while True:
    result, video_frame = video_capture.read()  #read frames
from the video
    if result is False:
        break  #terminate the loop if the frame is not read
successfully

    faces = detect_bounding_box(video_frame)  #apply the
function we created to the video frame
    cv2.imshow("My Face Detection Project",video_frame)
#display the processed frame in a window named "My Face
Detection Project"

    if cv2.waitKey(1)& 0xFF == ord("q"):
        break

video_capture.release()
cv2.destroyAllWindows()
```

Output:



```
Python 3.10.5 (tags/v3.10.5:f377153, Jun  6 2022, 16:14:13) [MSC v.1929 64 bit (
AMD64)] on win32
                                                     nse()" for more information.
>>>
                                                     acerecognition.py ==================
```