

Deccan Education Society's
Kirti M. Doongursee College of Arts, Science and Commerce
[NAAC Accredited: "A Grade"]



M.Sc. [Computer Science]

Practical Journal

PAPER: PSCSP401

Roll Number [_____]

Department of Computer Science and Information Technology

Department of Computer Science and Information Technology
Deccan Education Society's
Kirti M. Doongursee College of Arts, Science and Commerce
[NAAC Accredited: "A Grade"]

C E R T I F I C A T E

This is to certify that Mr./Mrs. _____
of M.Sc. (Computer Science) with Roll No._____ has completed **9**
Practicals of Paper **PSCSP401** under my supervision in this College during the
year 2022-2023.

Lecturer-In-Charge

H.O.D.

Dept of CS & IT

Date:

Date:

Examined by:

Remarks:

Date:

Index

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7	Add the sensors to the robot object and develop the line follower behavior code	
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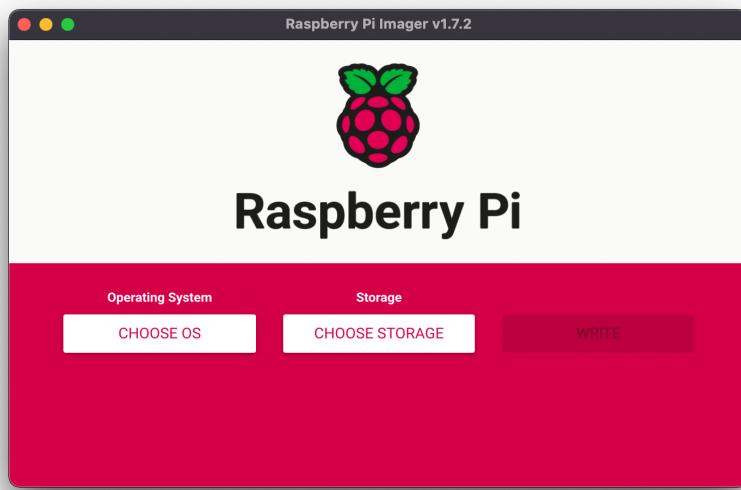
Practical No. 1

Aim: Making Raspberry pi headless, and reaching it from the network using WiFi and SSH.

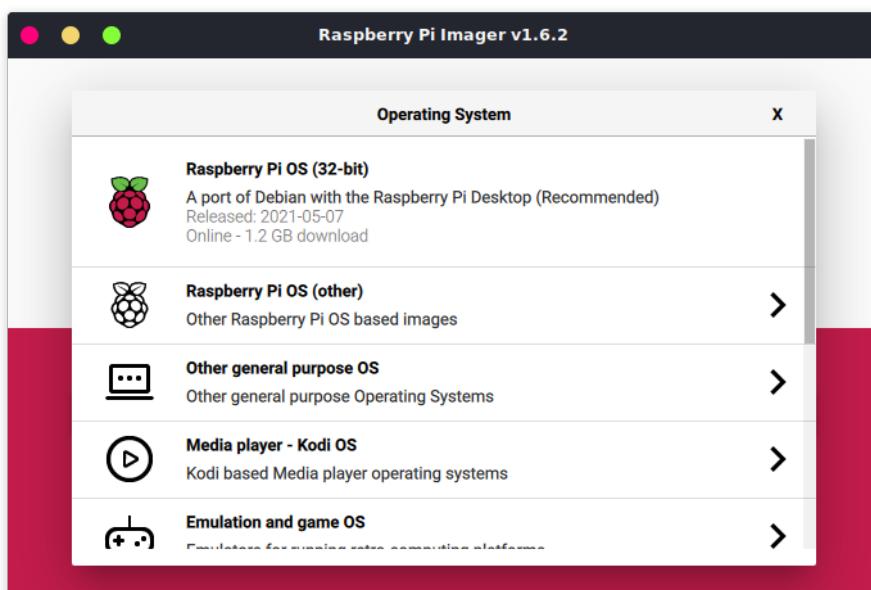
Procedure:

Step 1: Go to <https://www.raspberrypi.com/software/> and click on the software tab.

Download raspberry pi imager and connect SD card to laptop.



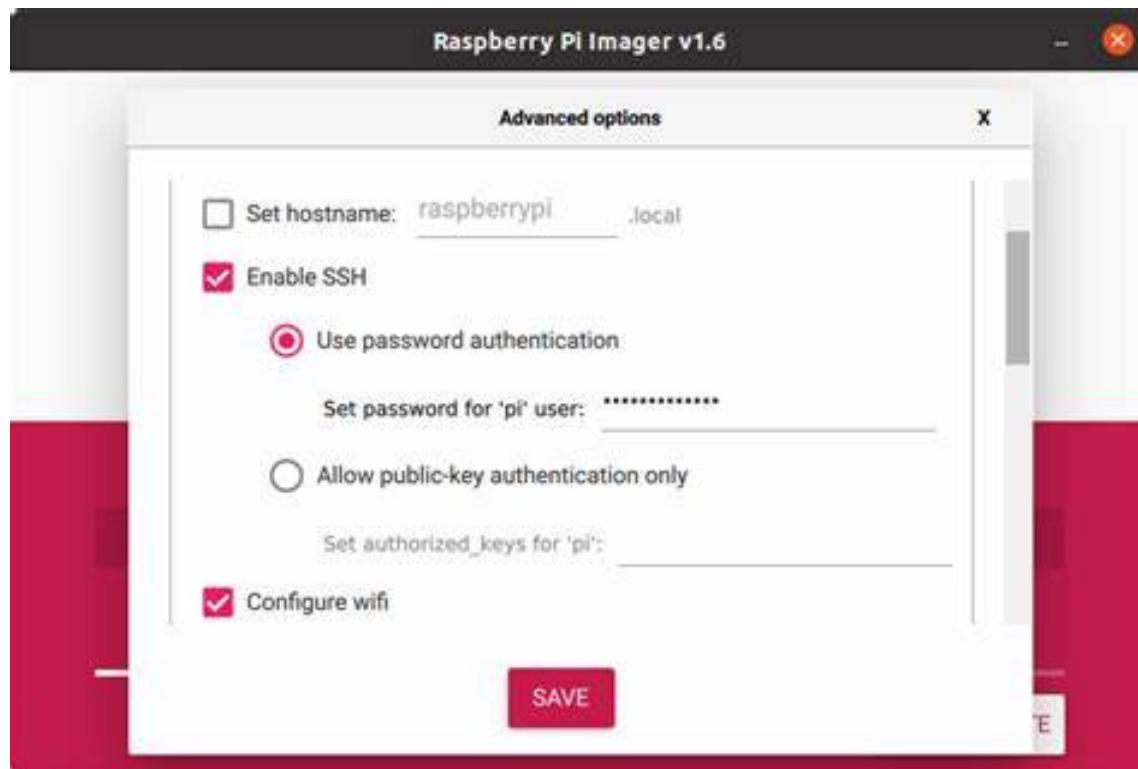
Step 2: Select operating system (raspberry pi OS 32-bit)



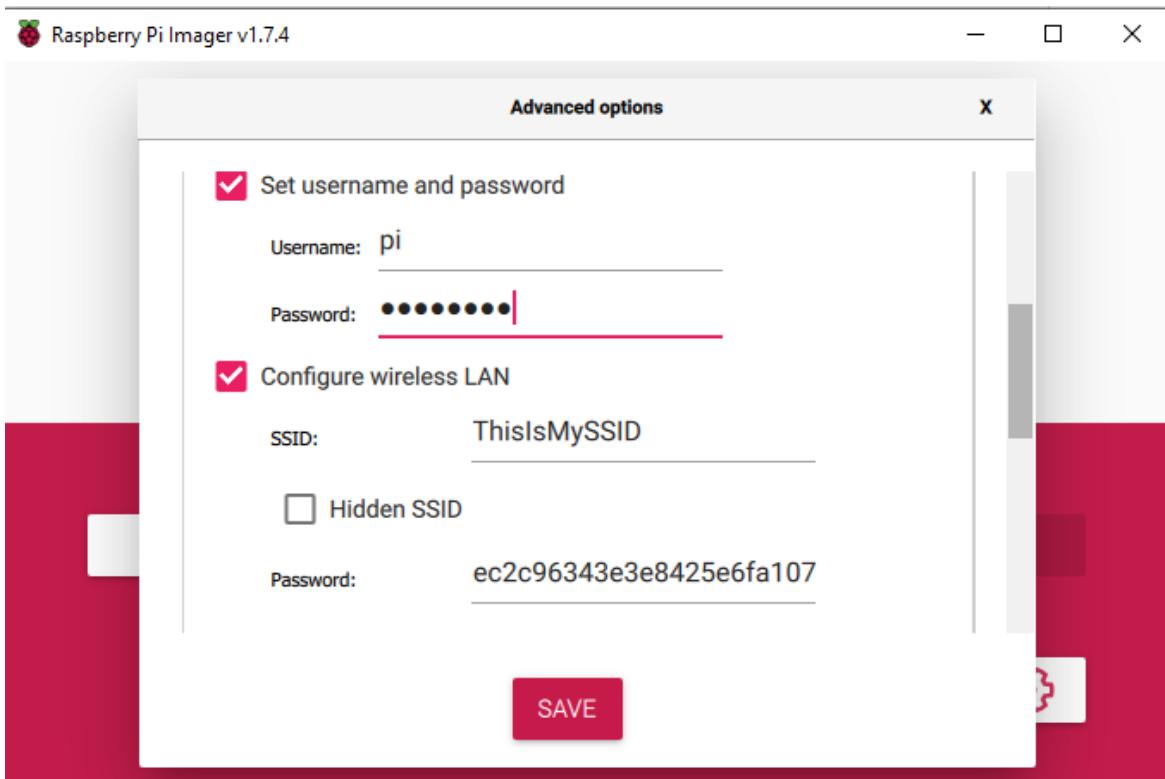
Step 3: Select storage



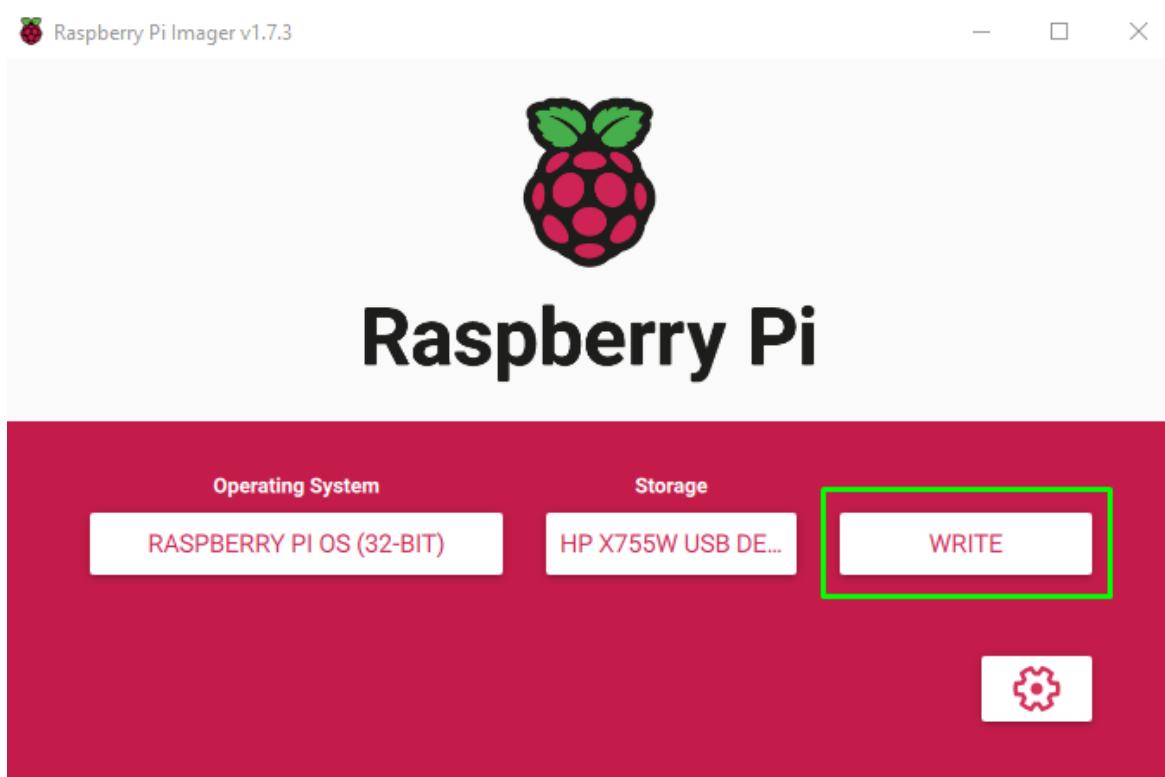
Step 4: Click on Setting Icon and set hostname. Click to enable SSH.



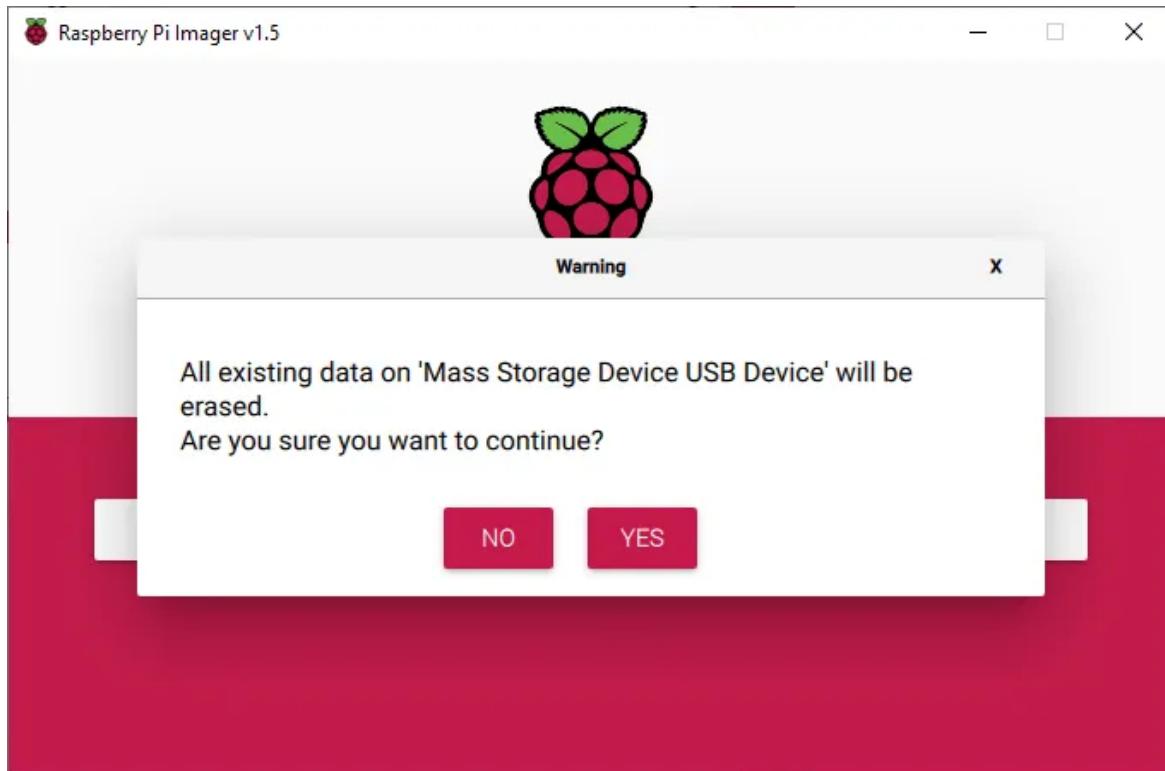
Step 5: Click to configure wireless LAN. And select a country.



Step 6: Click on write.



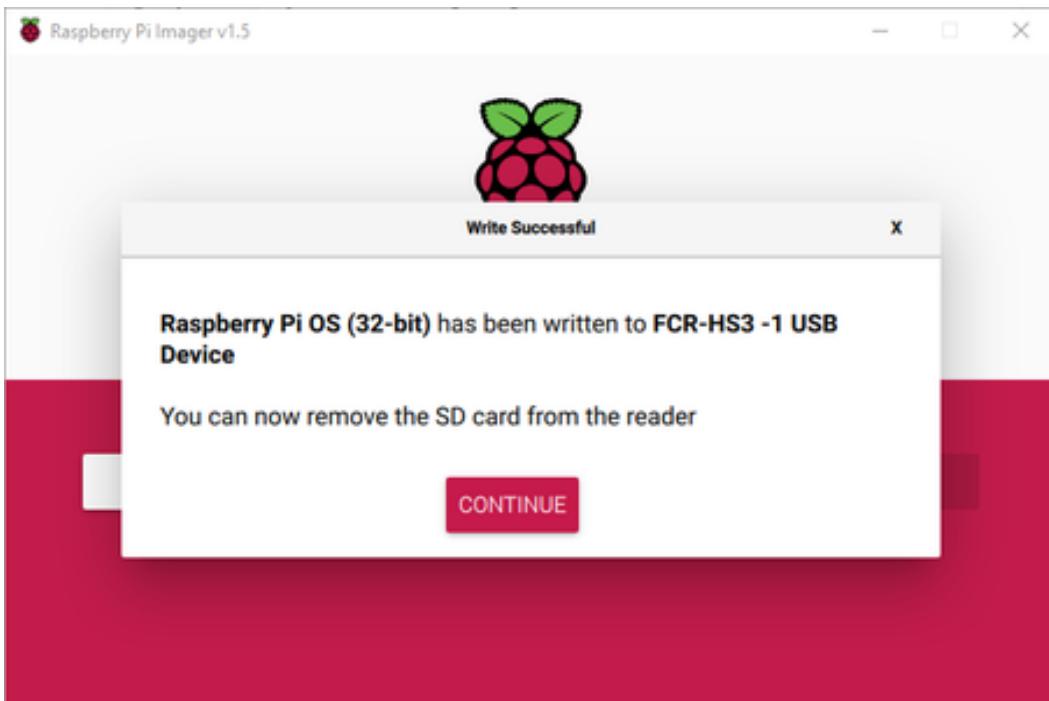
Step 7: Click on yes.



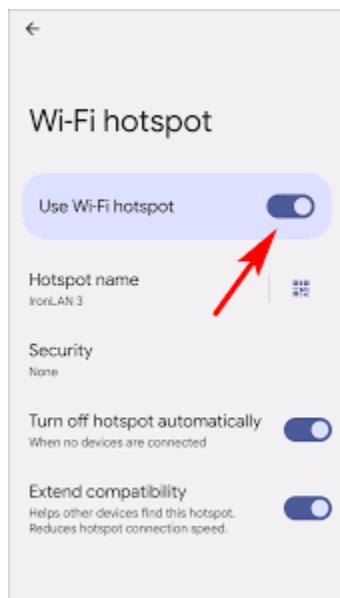
Step 8: Verifying raspberry pi.



Step 9: Click on continue.

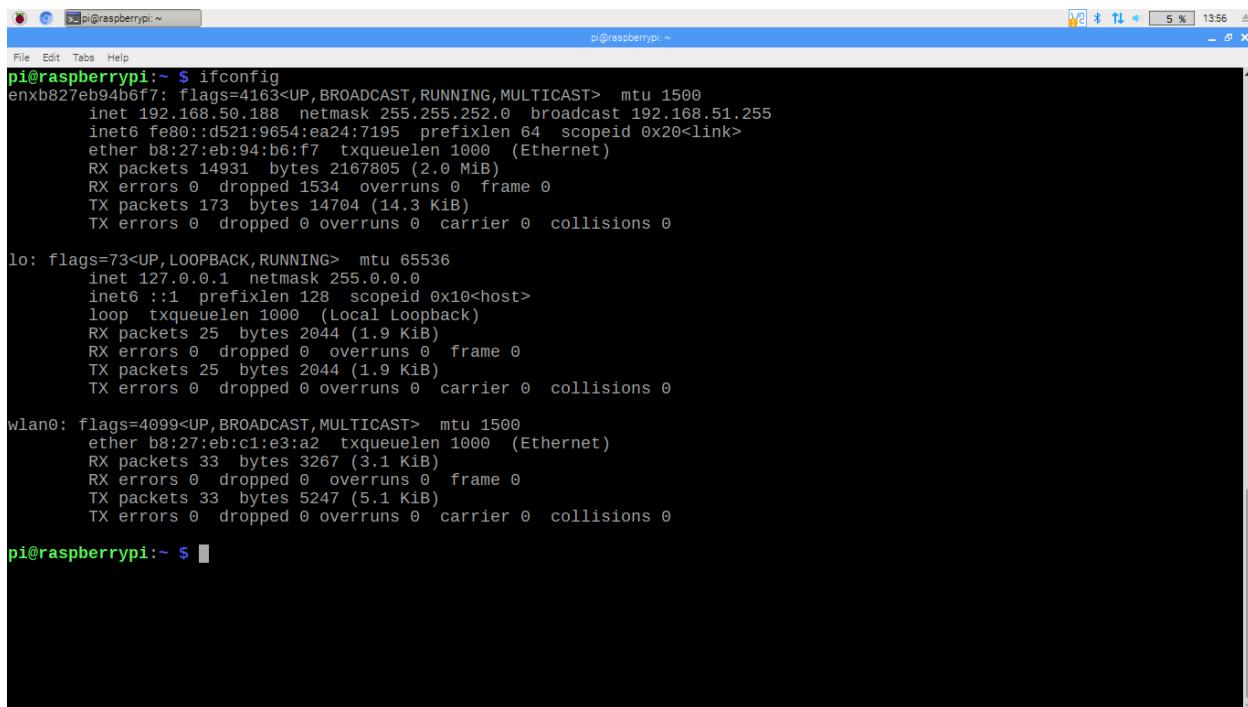


Step 10: Check the connection in your mobile hotspot of raspberry pi.



Step 11: Open terminal and execute following command:

1. ifconfig



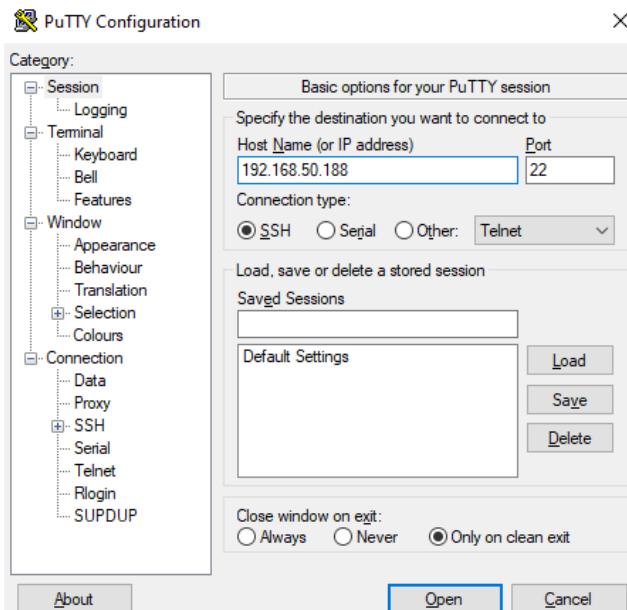
```
pi@raspberrypi:~ $ ifconfig
enxb827eb94b6ff: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.50.188 netmask 255.255.252.0 broadcast 192.168.51.255
        inet6 fe80::d521:9654:ea24:7195 prefixlen 64 scopeid 0x20<link>
            ether b8:27:eb:94:b6:f7 txqueuelen 1000 (Ethernet)
            RX packets 14931 bytes 2167805 (2.0 MiB)
            RX errors 0 dropped 1534 overruns 0 frame 0
            TX packets 173 bytes 14704 (14.3 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 25 bytes 2044 (1.9 KiB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 25 bytes 2044 (1.9 KiB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

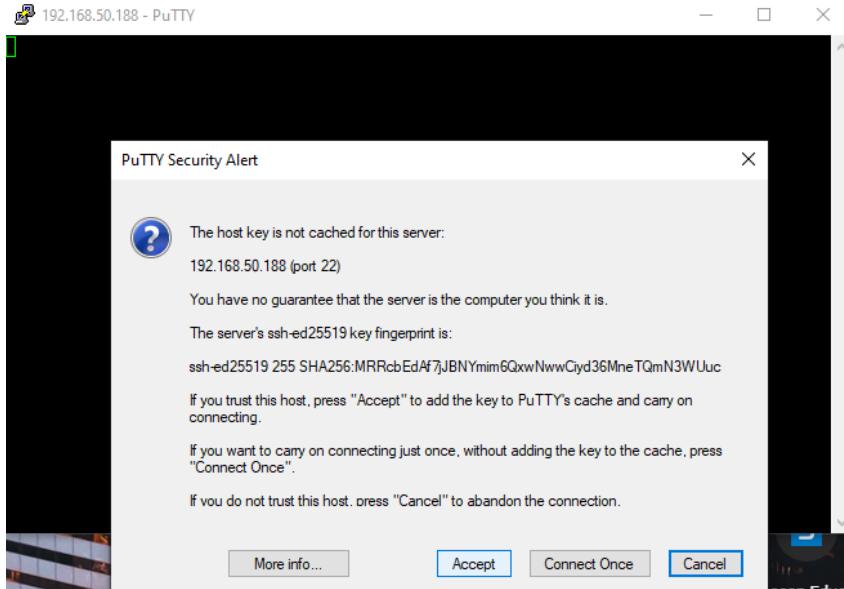
wlan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether b8:27:eb:c1:e3:a2 txqueuelen 1000 (Ethernet)
    RX packets 33 bytes 3267 (3.1 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 33 bytes 5247 (5.1 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pi@raspberrypi:~ $
```

Step 12: Open Putty and add Hostname as raspberry pi ip address and click on open.



Step 13: Click on Accept



Step 14: Enter username and password:

```
pi@raspberrypi: ~
pi@raspberrypi: ~ login as: pi
pi@192.168.50.188's password:
Linux raspberrypi 4.19.66-v7+ #1253 SMP Thu Aug 15 11:49:46 BST 2019 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: Sun May 21 14:31:06 2023 from 192.168.50.129

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: ~ $
```

```
pi@raspberrypi: ~/Desktop
pi@raspberrypi: ~/Desktop login as: pi
pi@192.168.50.188's password:
Linux raspberrypi 4.19.66-v7+ #1253 SMP Thu Aug 15 11:49:46 BST 2019 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
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This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.

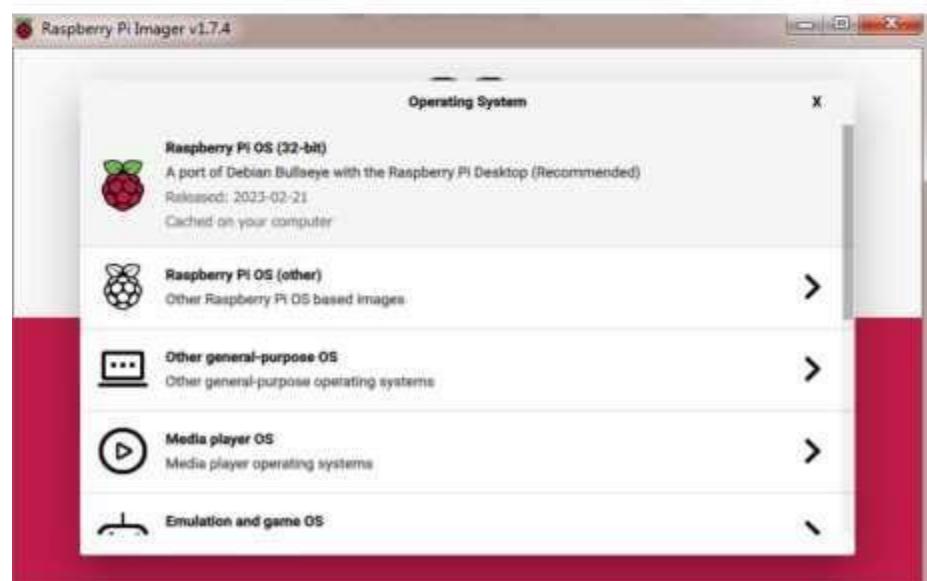
pi@raspberrypi: ~ ls
2023-06-07-135650_1366x768_scrot.png 2023-06-07-135653_1366x768_scrot.png  Downloads led.py      Pictures  prac4.py    socket.server.py
2023-06-07-135651_1366x768_scrot.png  Desktop      gpio.py     Music      prac1.py   Public    Templates
2023-06-07-135652_1366x768_scrot.png  Documents    home       oldconffiles prac3.py  python_games Videos
pi@raspberrypi: ~ ls
2023-06-07-135650_1366x768_scrot.png 2023-06-07-135653_1366x768_scrot.png  Downloads led.py      Pictures  prac4.py    socket.server.py
2023-06-07-135651_1366x768_scrot.png  Desktop      gpio.py     Music      prac1.py   Public    Templates
2023-06-07-135652_1366x768_scrot.png  Documents    home       oldconffiles prac3.py  python_games Videos
pi@raspberrypi: ~ cd Desktop
pi@raspberrypi: ~/Desktop ls
image lterminal.desktop  Music Node-RED.desktop
pi@raspberrypi: ~/Desktop $
```

Practical No. 2

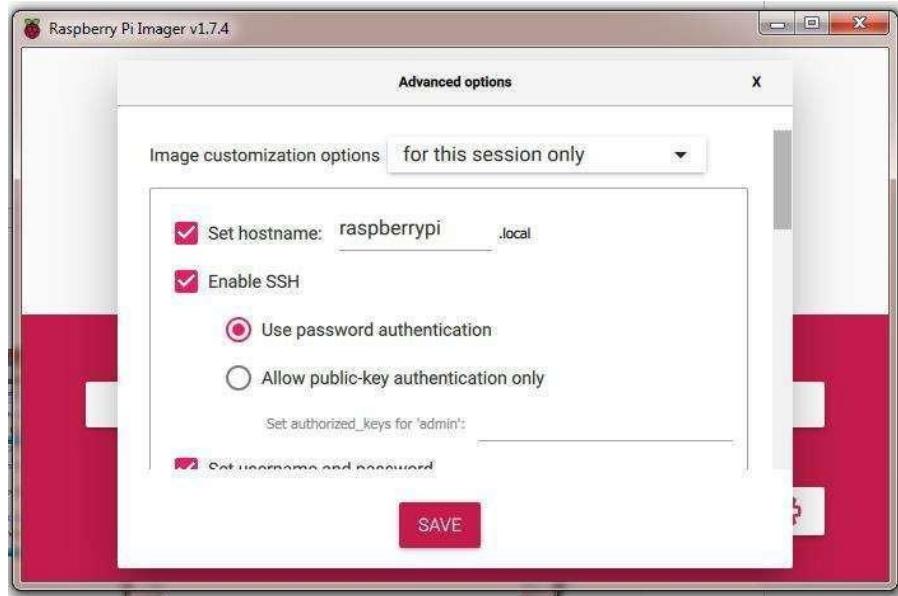
Aim: Using sftp upload files from PC.

Procedure:

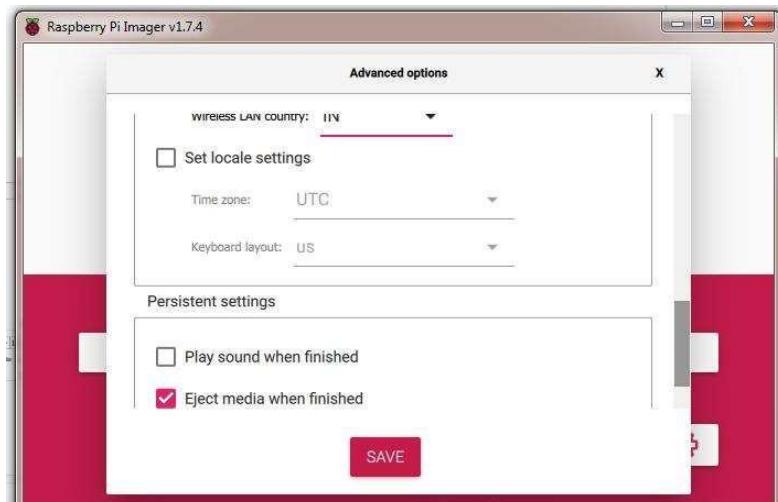
Step 1: Install the Raspberry Pi Imager

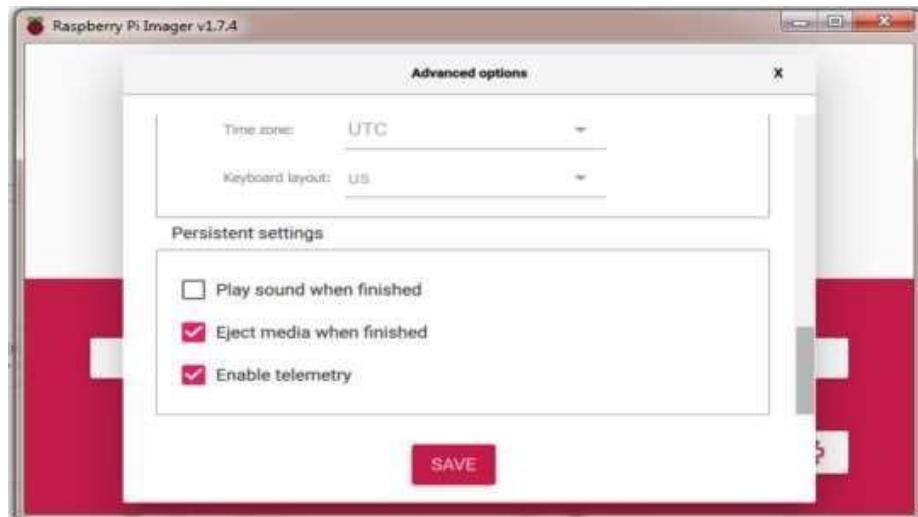


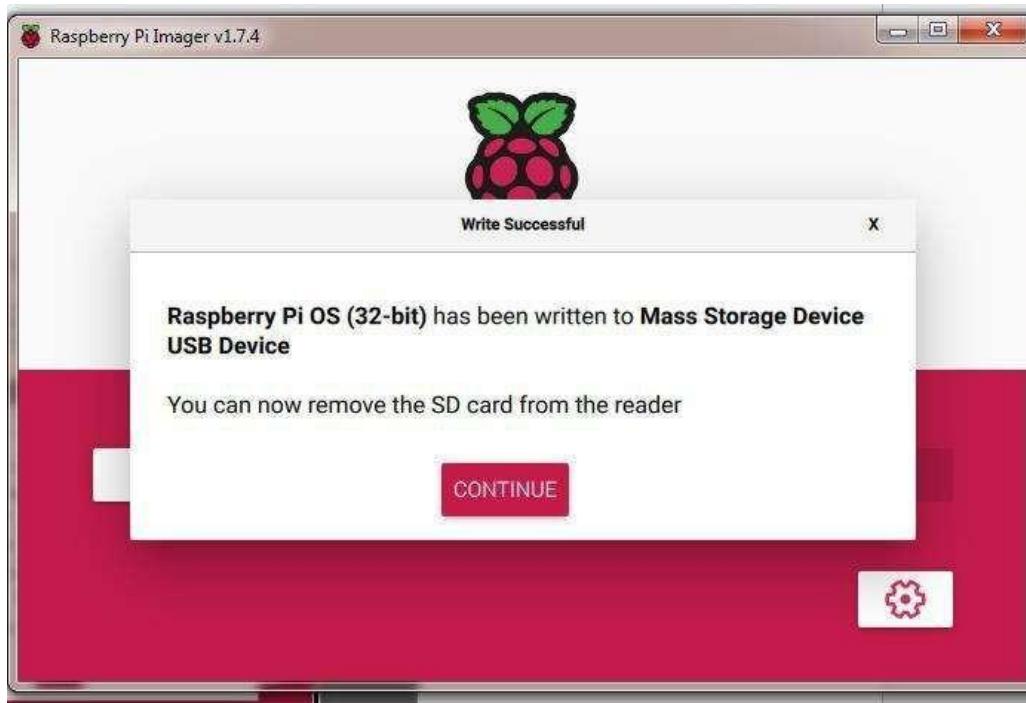
Step 2: Set Hostname , enable SSH, Set Username and Password.



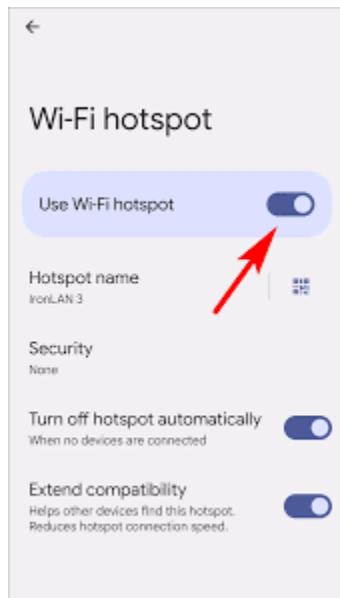
Step 3: Set SSID and Password of WiFi which is used





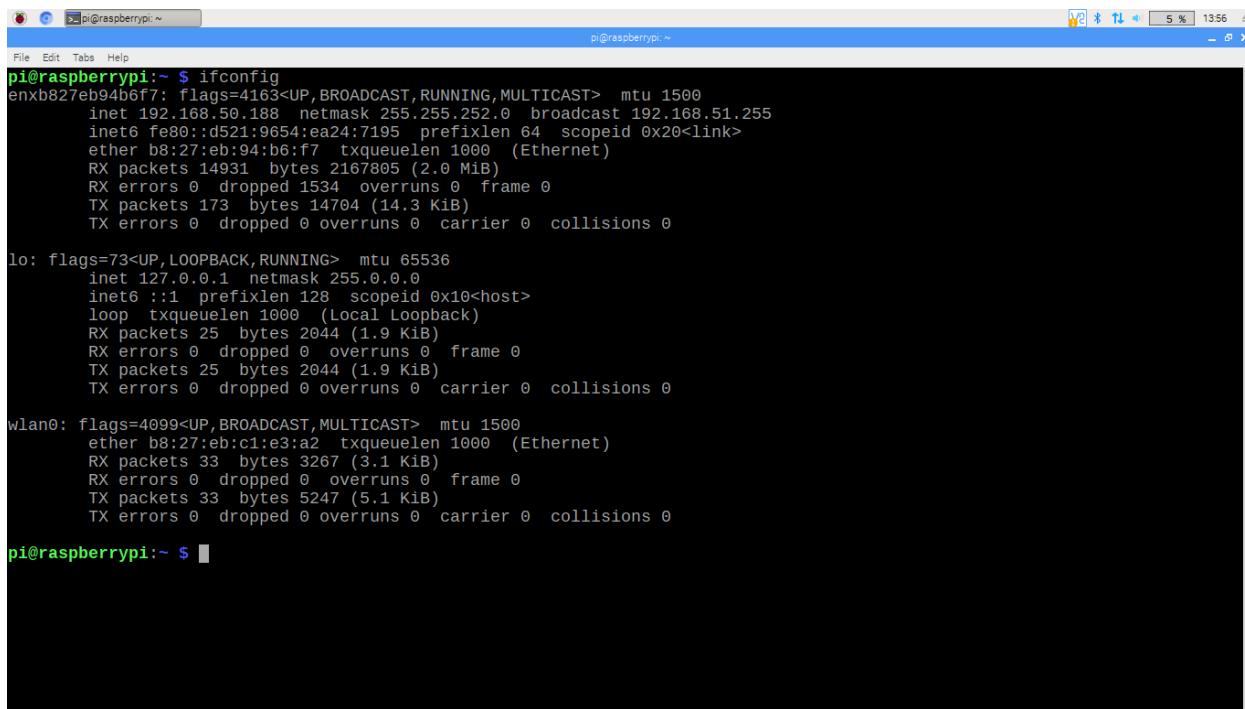


Step 4: Connect Raspberry Pi WiFi and Laptop WiFi to Mobile device.



Step 5: Open terminal and execute following command:

1. if config



```
pi@raspberrypi:~ $ ifconfig
enxb827eb94b6f7: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.50.188 netmask 255.255.252.0 broadcast 192.168.51.255
        inet6 fe80::d521:9654:ea24:7195 prefixlen 64 scopeid 0x20<link>
            ether b8:27:eb:94:b6:f7 txqueuelen 1000 (Ethernet)
            RX packets 14931 bytes 2167805 (2.0 MiB)
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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 25 bytes 2044 (1.9 KiB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 25 bytes 2044 (1.9 KiB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether b8:27:eb:c1:e3:a2 txqueuelen 1000 (Ethernet)
    RX packets 33 bytes 3267 (3.1 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 33 bytes 5247 (5.1 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pi@raspberrypi:~ $
```

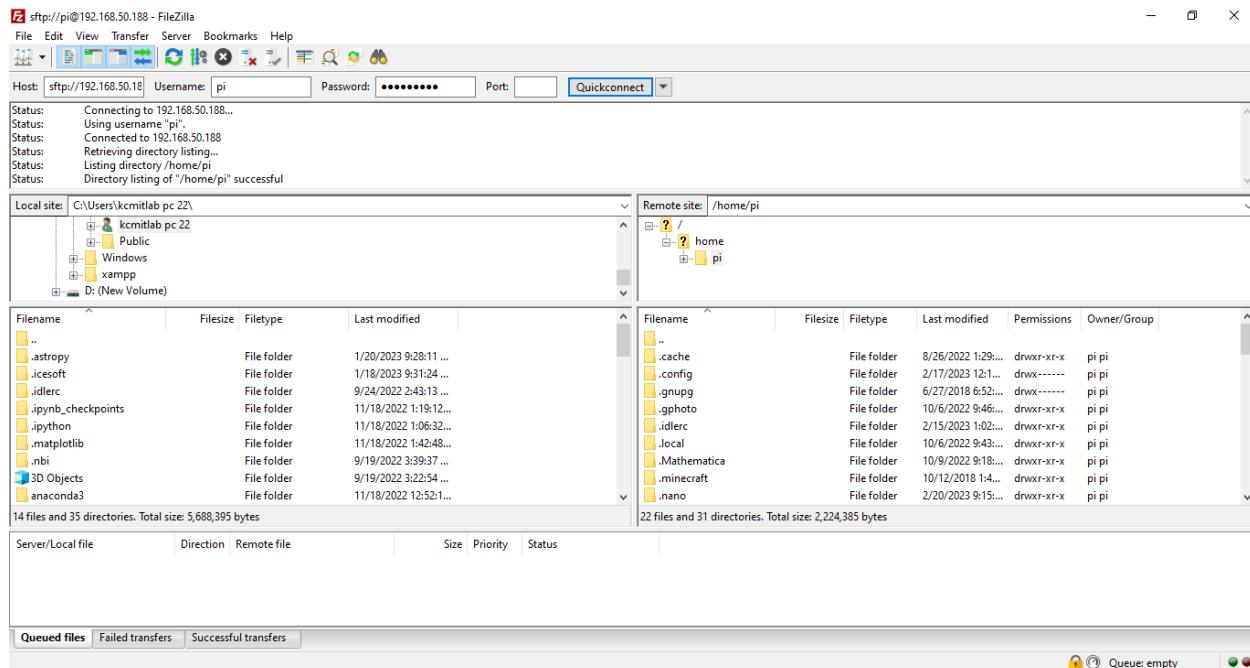
Step 6: Copy ip address and download Filezilla (Client)



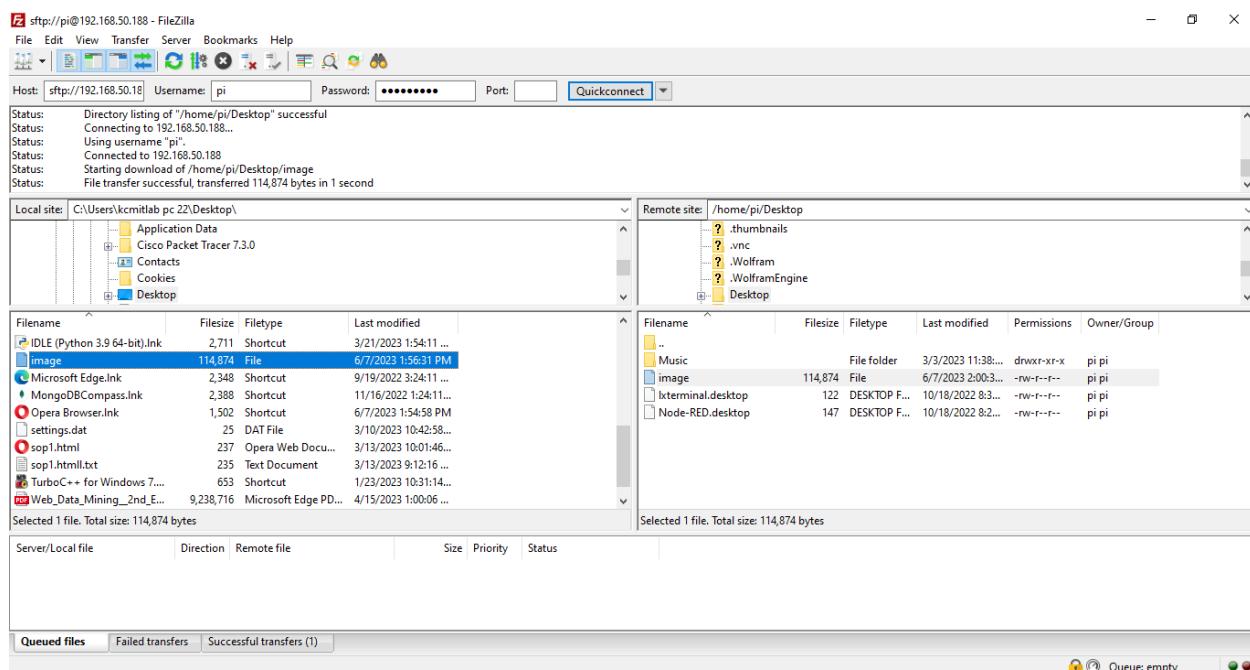
The screenshot shows the official FileZilla website. The header includes the FileZilla logo and the tagline "The free FTP solution". On the left, there's a sidebar with links for Home, FileZilla (Features, Screenshots, Download, Documentation, FileZilla Pro), FileZilla Server (Download), Community (Forum, Wiki), General (FAQ, Support, Contact, License, Privacy Policy, Trademark Policy), and Development (Source code, Nightly builds, Translations, Version history, Changelog, Issue tracker). The main content area has a "Promotions" banner for FileZilla Pro. Below it, a section titled "Download FileZilla Client for Windows (64bit x86)" provides information about the latest stable version (3.64.0) and offers a "Download FileZilla Client" button with a red arrow pointing to it. A note says the installer may include bundled offers. It also mentions supported Windows versions (8.1, 10, 11). There are "More download options" and "Other platforms" sections, along with a "Not what you are looking for?" link. To the right, there's a screenshot of the FileZilla client interface.

Step 7: Open filezilla:

- In host paste ip address
- Username: pi
- Password: raspberry and click on Quickconnect



Step 8: Drag and Drop any file from Local site to Remote site



Practical No. 3

Aim: Write a Python code to test motor

Code:

```
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)
GPIO.setwarnings(False)

motor_1A = 4
motor_1B = 17
motor_2A = 23
motor_2B = 24

GPIO.setup(motor_1A, GPIO.OUT)
GPIO.setup(motor_1B, GPIO.OUT)
GPIO.setup(motor_2A, GPIO.OUT)
GPIO.setup(motor_2B, GPIO.OUT)

seq = [[1, 0, 0, 1], [1, 0, 0, 0], [1, 1, 0, 0],
        [0, 1, 0, 0], [0, 1, 1, 0], [0, 0, 1, 0],
        [0, 0, 1, 1], [0, 0, 0, 1]]
delay = 0.005

for i in range(10):
    for h_step in range(8):
        for pin in range(4):
            GPIO.output(motor_1A, seq[h_step][0])
            GPIO.output(motor_1B, seq[h_step][1])
            GPIO.output(motor_2A, seq[h_step][2])
```

```
    GPIO.output(motor_2B, seq[h_step][3])
    time.sleep(delay)

for h_step in reversed(range(8)):
    for pin in range(4):
        GPIO.output(motor_1A, seq[h_step][0])
        GPIO.output(motor_1B, seq[h_step][1])
        GPIO.output(motor_2A, seq[h_step][2])
        GPIO.output(motor_2B, seq[h_step][3])
        time.sleep(delay)

GPIO.cleanup()
```

Practical No. 4

Aim: Write a Python code to run motor in Predetermined path

Code:

```
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)
GPIO.setwarnings(False)

motor1 = 4
motor2 = 17
motor3 = 23
motor4 = 24

GPIO.setup(motor1, GPIO.OUT)
GPIO.setup(motor2, GPIO.OUT)
GPIO.setup(motor3, GPIO.OUT)
GPIO.setup(motor4, GPIO.OUT)

seq = [[1, 0, 0, 1], [1, 0, 0, 0], [1, 1, 0, 0],
        [0, 1, 0, 0], [0, 1, 1, 0], [0, 0, 1, 0],
        [0, 0, 1, 1], [0, 0, 0, 1]]

path = [[1, 0, 0, 0], [1, 1, 0, 0], [0, 1, 0, 0],
        [0, 1, 1, 0], [0, 0, 1, 0], [0, 0, 1, 1],
        [0, 0, 0, 1], [1, 0, 0, 1]]

delay = 0.05

for step in path:
```

```
GPIO.output(motor1, step[0])
GPIO.output(motor2, step[1])
GPIO.output(motor3, step[2])
GPIO.output(motor4, step[3])
time.sleep(delay)

GPIO.cleanup()
```

Practical No. 5

Aim: Develop Python code for testing the sensors.

Code:

```
int pirsensor = 0;

void setup() {
    pinMode(2, INPUT);
    pinMode(12, OUTPUT);
    pinMode(13, OUTPUT)
}

void loop() {
    pirsensor = digitalRead(2);

    if (pirsensor == HIGH) {
        digitalWrite(13, HIGH);
        tone(12, 500, 500);
    }

    digitalWrite(13, LOW)
}
```

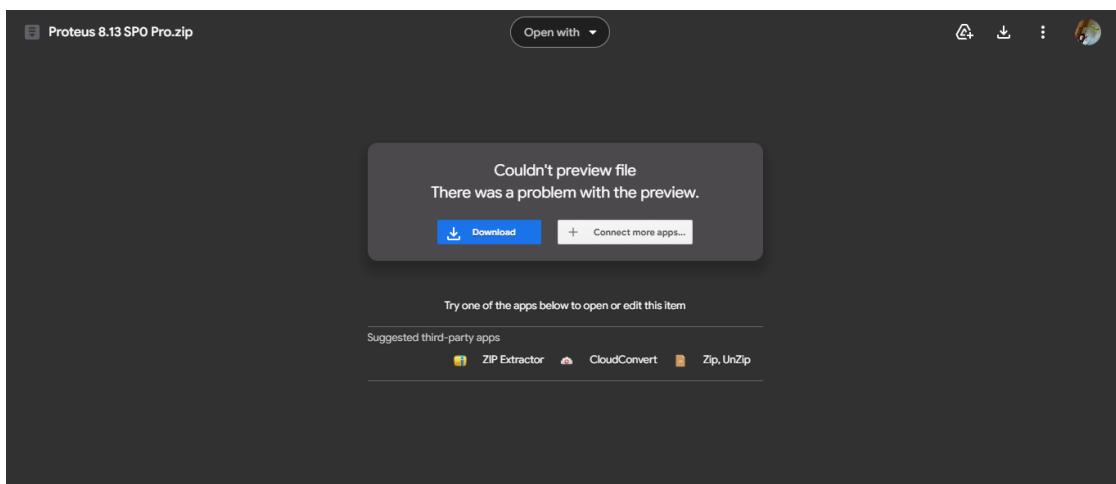
Practical No. 6

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

Components Used:

1. Arduino uno
2. IR sensors (x2)
3. L298 Motor Controller
4. DC motors (x2)
5. Logic Toggle (x2)
6. Ground
7. Power, DC

Step 1: Download and install Proteus and Arduino IDE.



A screenshot of the Arduino website. At the top is a navigation bar with links for HARDWARE, SOFTWARE (which is underlined), CLOUD, DOCUMENTATION, COMMUNITY, BLOG, and ABOUT. Below the navigation bar is a section titled "Nightly Builds" with a sub-section for "Windows". It lists "macOS Version 10.14: 'Mojave' or newer, 64 bits", "Linux AppImage 64 bits (X86-64)", "Linux ZIP file 64 bits (X86-64)", and a "Changelog" link.

Arduino with Chromebook

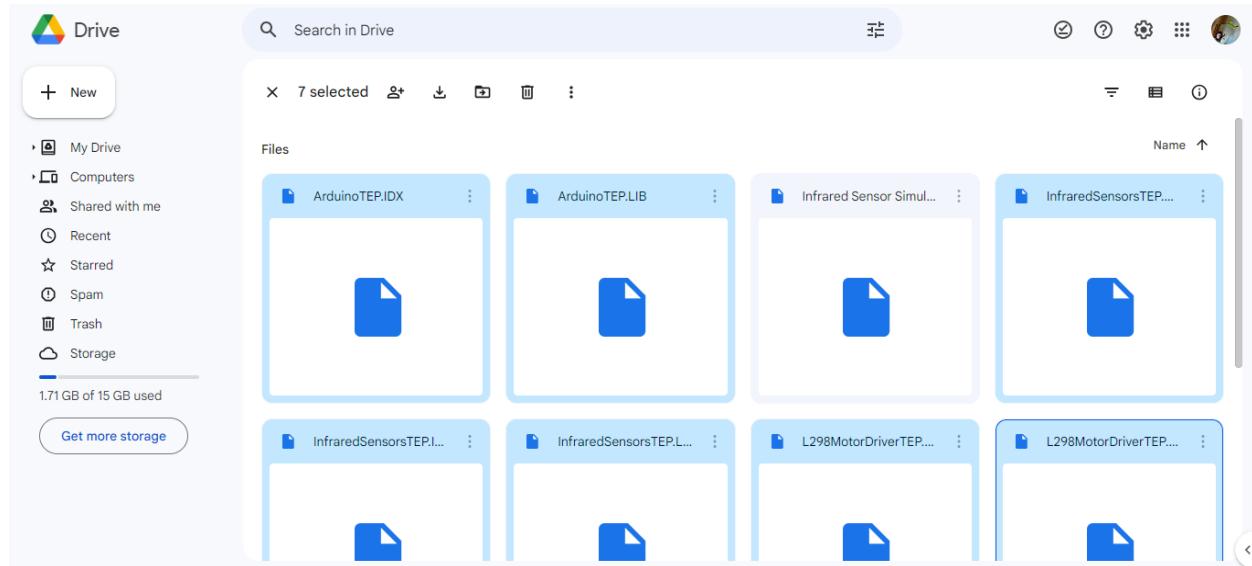
To program Arduino from a Chromebook, you can use the [Arduino Web Editor](#) on Arduino Cloud. The desktop version of the IDE is not available on Chrome OS.

[Help](#)

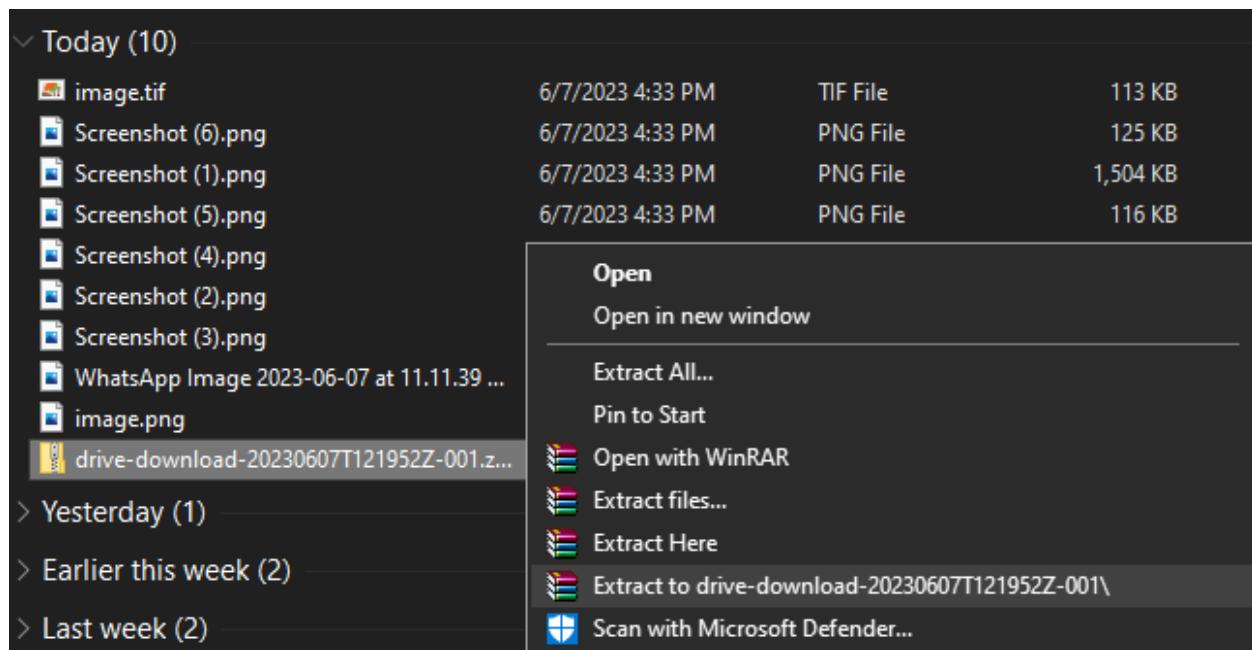
Step 2: Download Libraries:

https://drive.google.com/drive/folders/18G4d2w5Sot_XCv7rKVMpC90EIM1FT8_f

Download selected libraries:



Step 3: Extract zip file.

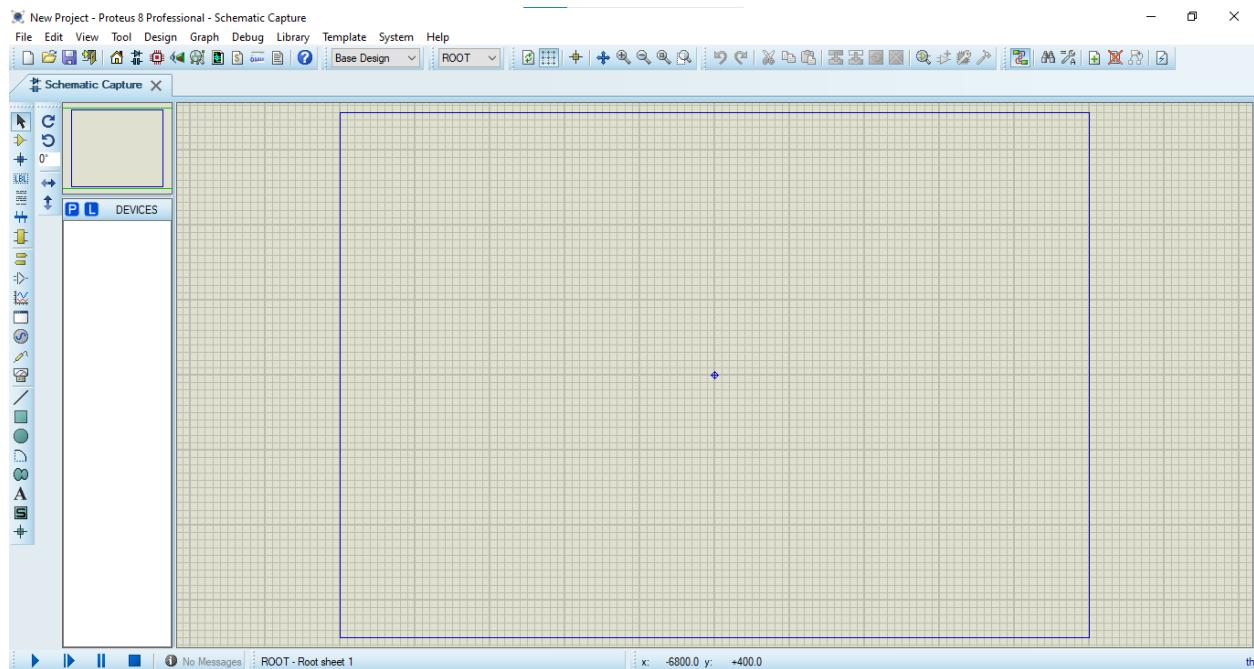
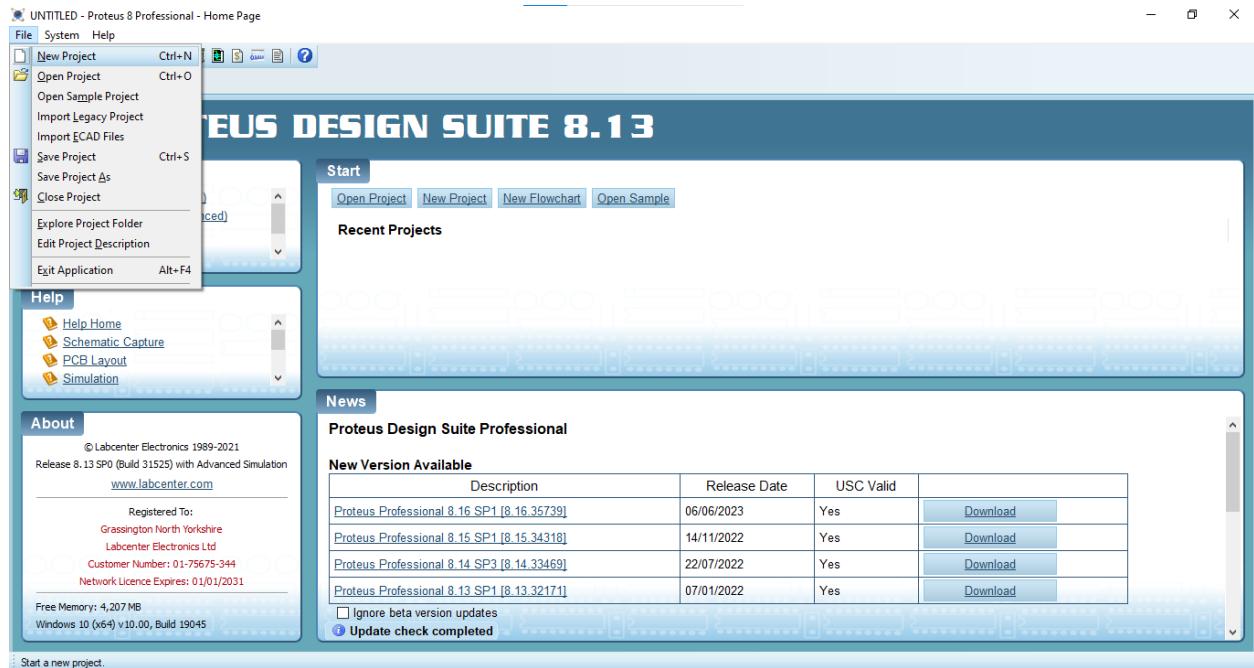


Step 4: Copy file and Paste in Proteus/DATA/LIBRARY folder

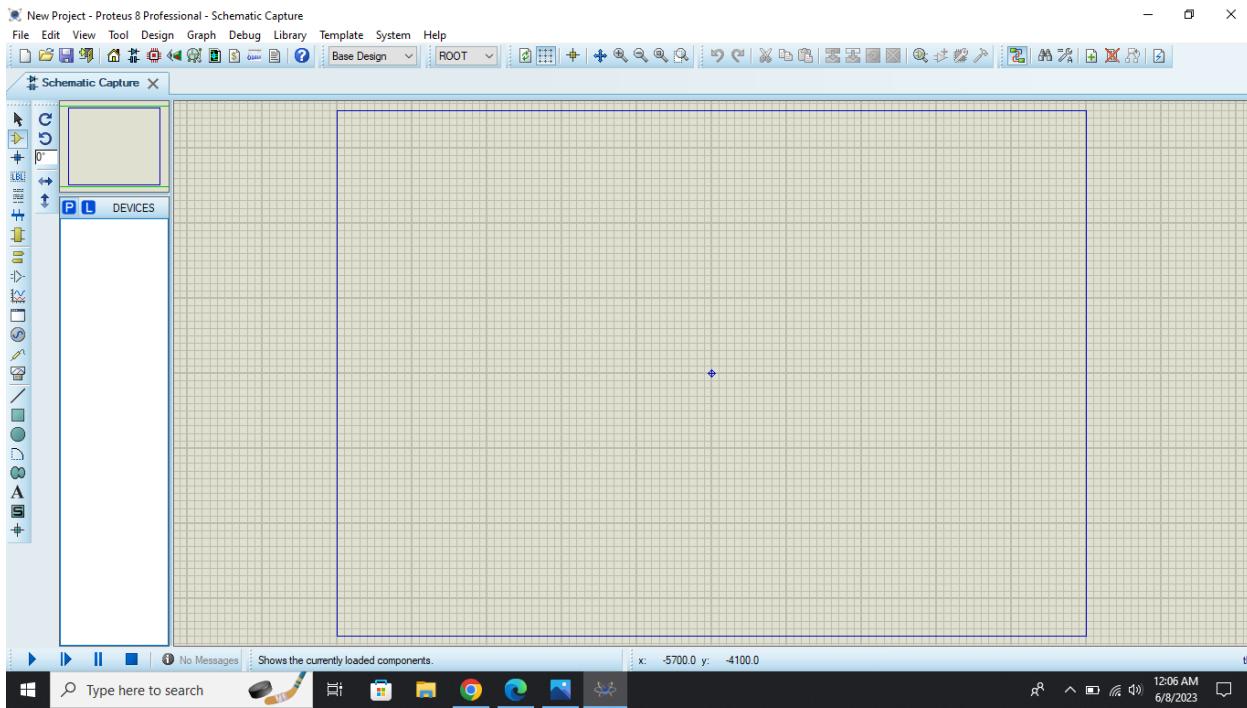
PC > Downloads > drive-download-20230607T121952Z-001			
Name	Date modified	Type	Size
ArduinoTEP.IDX	5/11/2023 12:37 AM	IDX File	1 KB
ArduinoTEP.LIB	5/11/2023 12:37 AM	LIB File	338 KB
InfraredSensorsTEP.HEX	5/11/2023 12:39 AM	HEX File	4 KB
InfraredSensorsTEP.IDX	5/11/2023 12:39 AM	IDX File	1 KB
InfraredSensorsTEP.LIB	5/11/2023 12:39 AM	LIB File	25 KB
L298MotorDriverTEP.IDX	9/16/2017 3:28 AM	IDX File	1 KB
L298MotorDriverTEP.LIB	9/16/2017 3:01 AM	LIB File	16 KB

PC > Local Disk (D:) > College > Robotics > Proteus > Proteus 8 Professional > DATA > LIBRARY			
Name	Date modified	Type	Size
ArduinoTEP.IDX	5/11/2023 12:37 AM	IDX File	1 KB
ArduinoTEP.LIB	5/11/2023 12:37 AM	LIB File	338 KB
ARM7.LIB	11/29/2012 4:30 PM	LIB File	99 KB
ASIMMDLS.LIB	7/22/2021 3:18 PM	LIB File	79 KB
ASSMANN.LIB	4/25/2019 2:38 PM	LIB File	375 KB
AVR.LIB	11/29/2012 4:30 PM	LIB File	40 KB
AVR_TINY0.LIB	1/20/2021 3:47 PM	LIB File	36 KB
AVR2.LIB	1/15/2018 5:36 PM	LIB File	465 KB
BIPOLAR.LIB	1/20/2021 3:47 PM	LIB File	200 KB
BluePill.LIB	8/31/2021 4:02 PM	LIB File	12 KB
BRIDGE.LIB	8/7/2017 9:59 AM	LIB File	163 KB
BSTAMP.LIB	11/29/2012 4:30 PM	LIB File	18 KB
BURRBROWN.LIB	12/21/2015 3:51 PM	LIB File	387 KB
CAPACITORS.LIB	6/9/2015 4:19 PM	LIB File	1,775 KB
CAPIEEE.LIB	6/9/2015 4:19 PM	LIB File	1,861 KB
CAPIPC7351.LIB	9/24/2013 2:23 PM	LIB File	5,798 KB
CAPIPC7351IEEE.LIB	9/24/2013 2:23 PM	LIB File	6,227 KB
CM0_NXP.LIB	6/24/2015 1:55 PM	LIB File	216 KB
CM3_ATMEL.LIB	7/22/2021 3:18 PM	LIB File	112 KB
CM3_NXP.LIB	7/22/2021 3:18 PM	LIB File	42 KB
CM3_STM32.LIB	8/31/2021 4:02 PM	LIB File	49 KB
CM4_STM32.LIB	9/6/2021 1:31 PM	LIB File	114 KB
CMOS.LIB	7/22/2021 3:18 PM	LIB File	435 KB
CONN_DIL.vml	6/28/2012 10:45 AM	VML File	2,938 KB

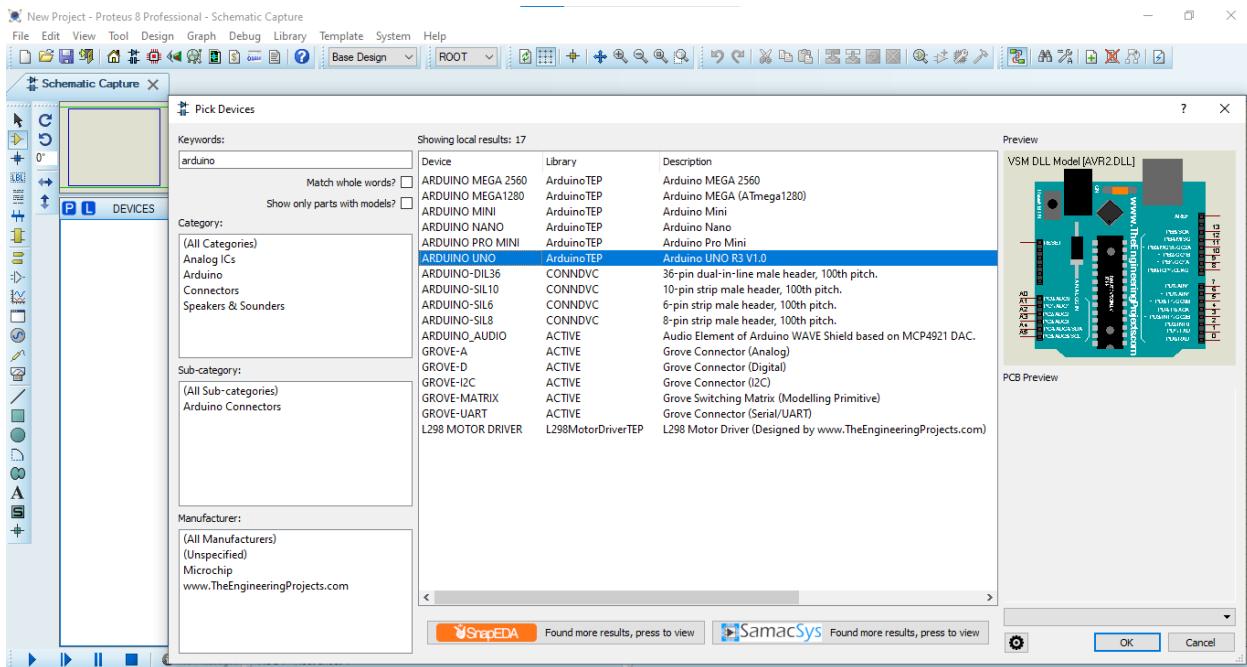
Step 5: Open Proteus > and Click on File > Create New Project.



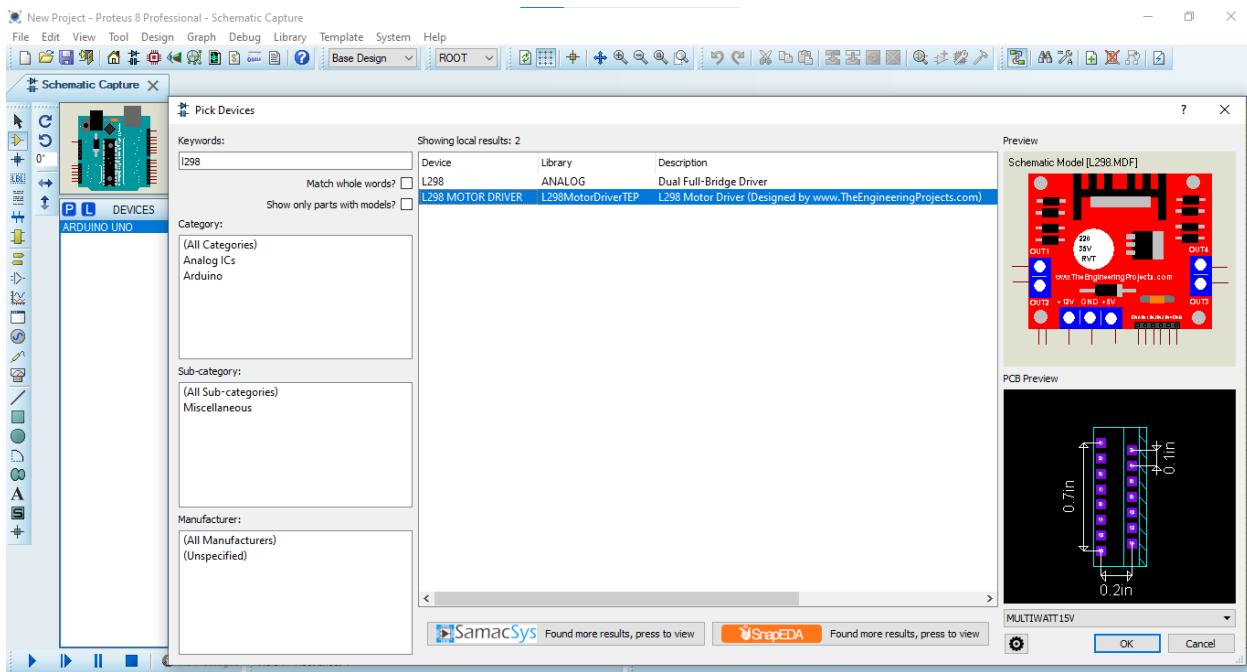
Step 6: Add components



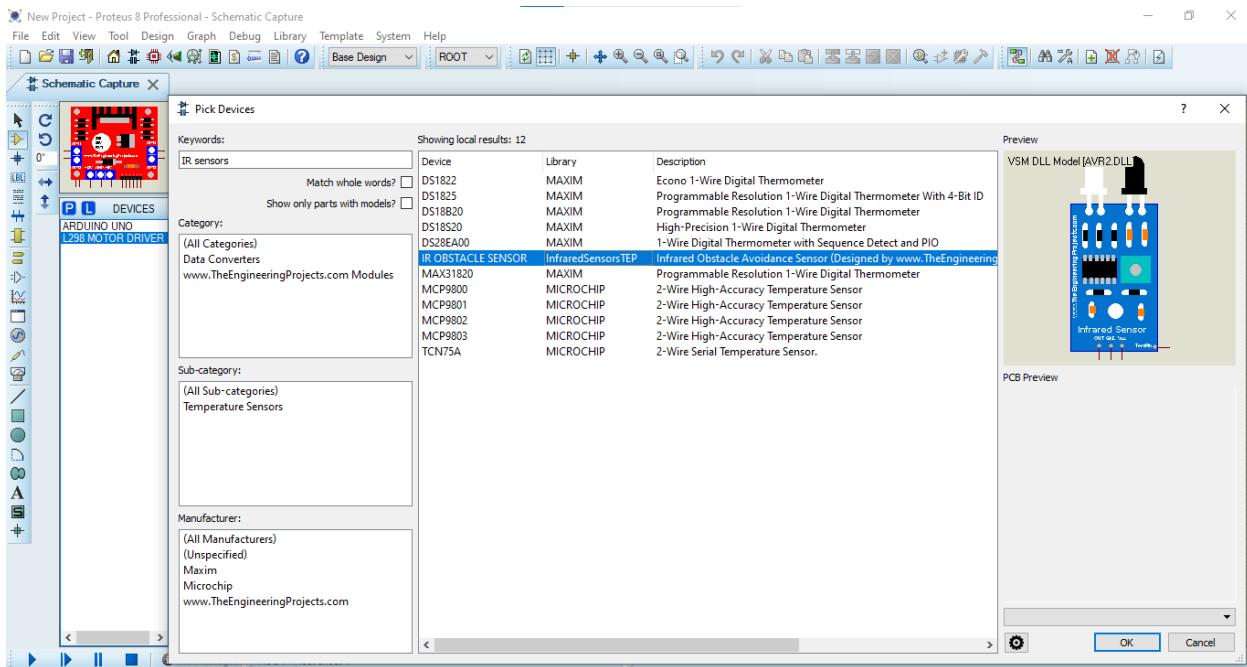
1. Add Arduino UNO



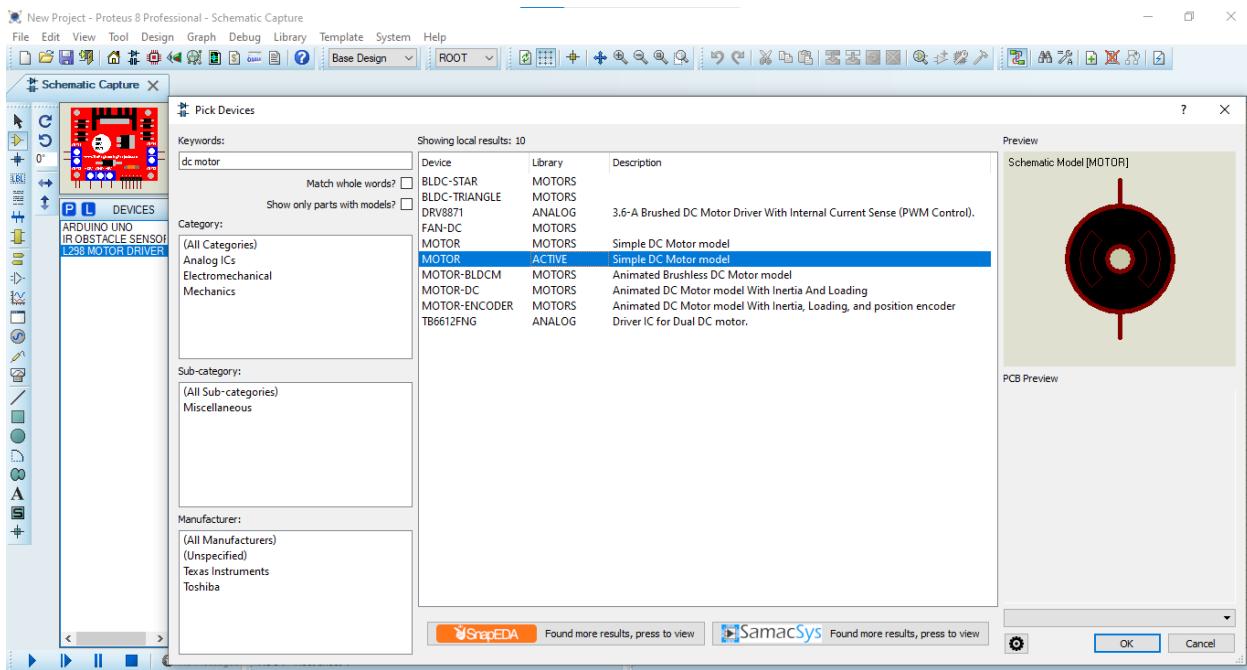
2. Add L298 Motor Driver



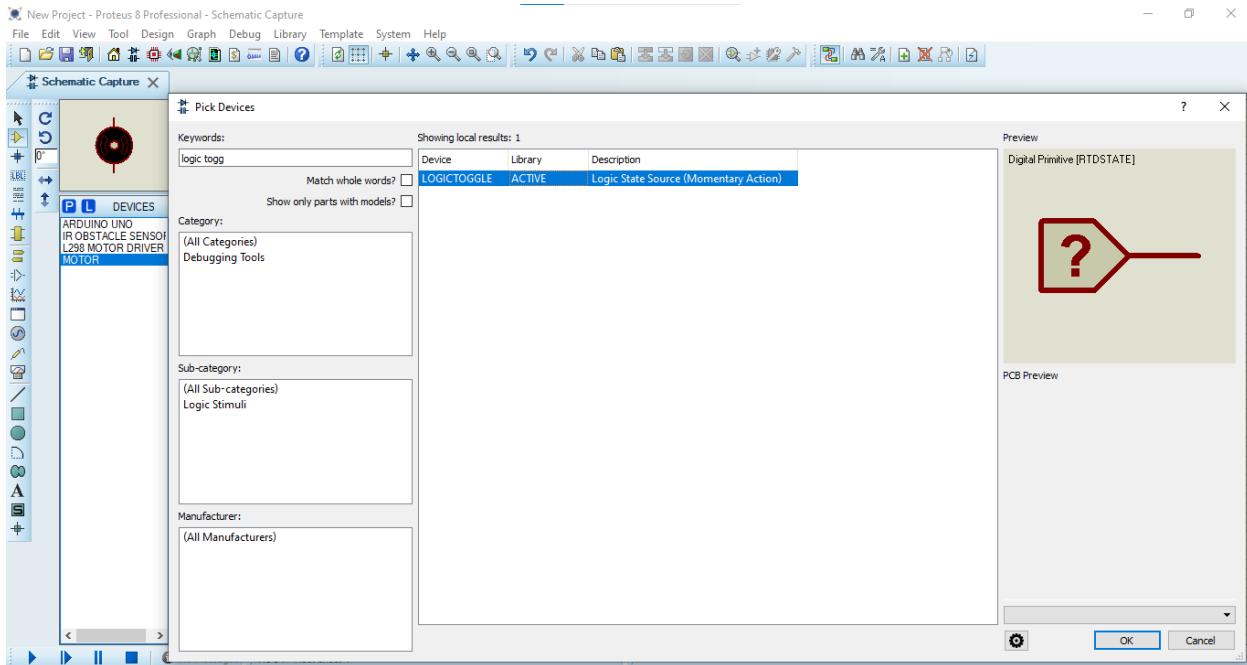
3. Add IR Obstacle Sensor



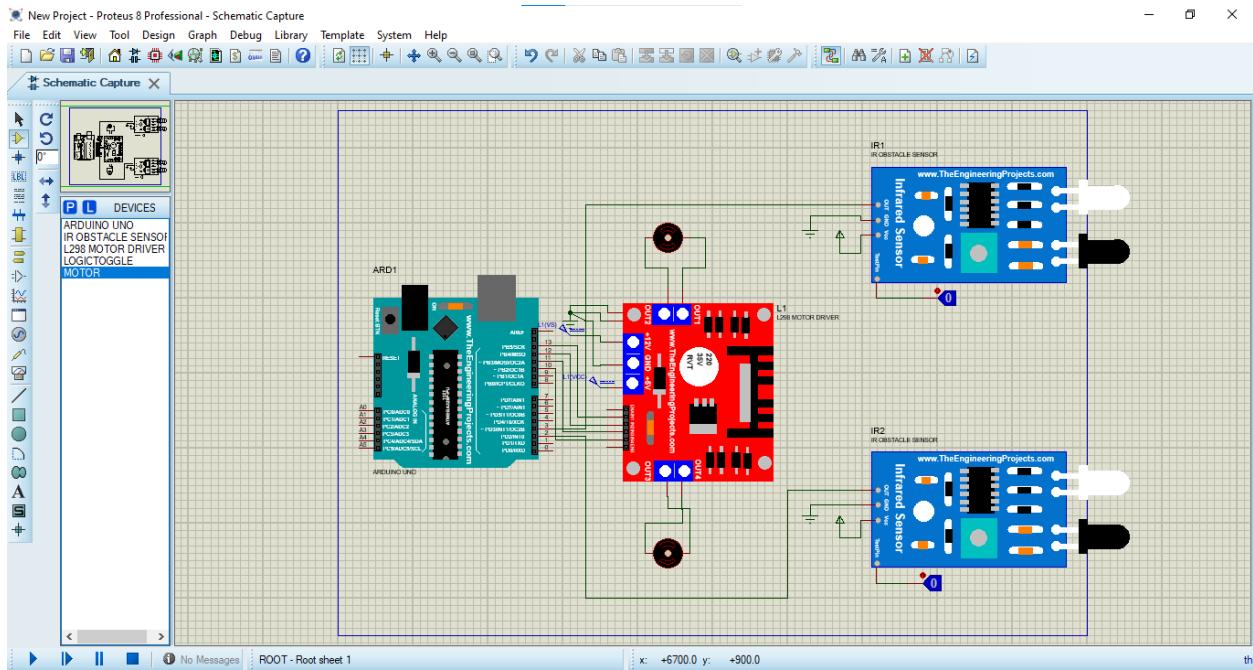
4. Add DC Motor



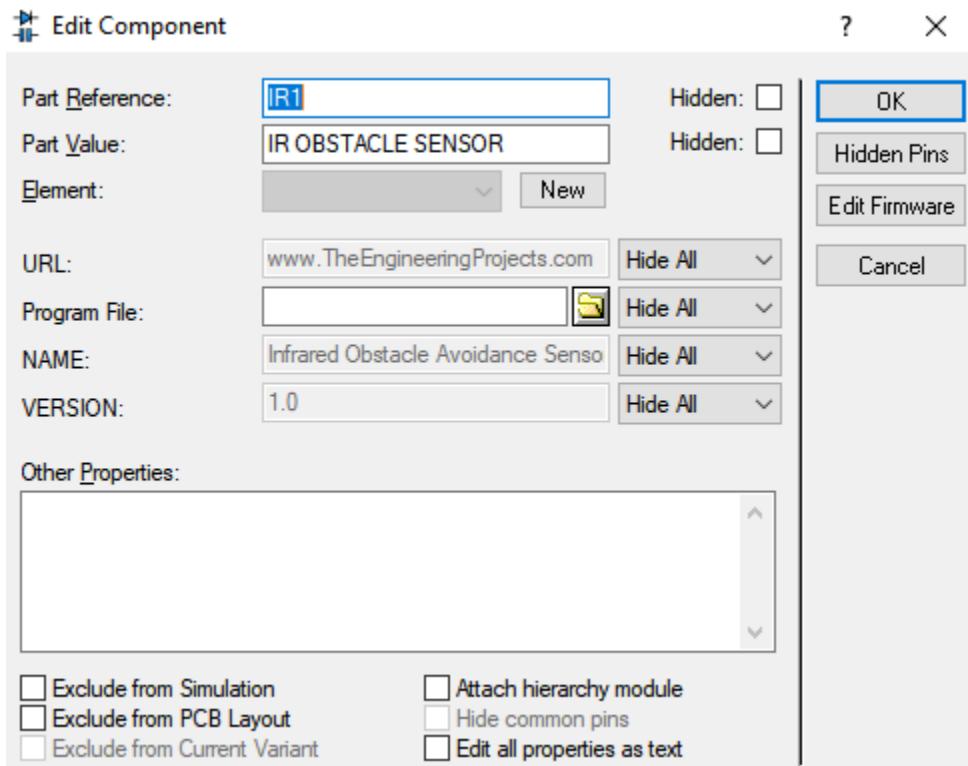
5. Add Logic Toggle

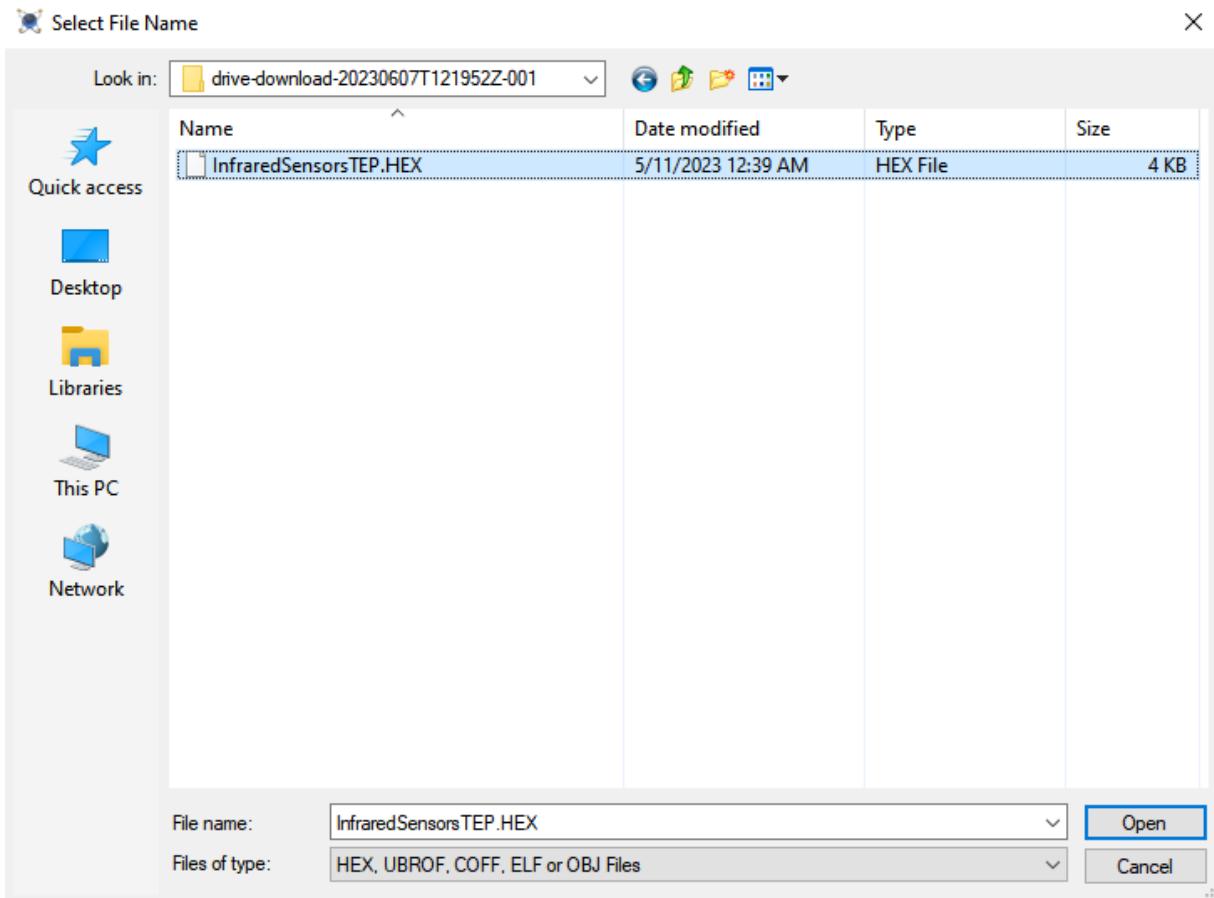


Step 7: Make Connection

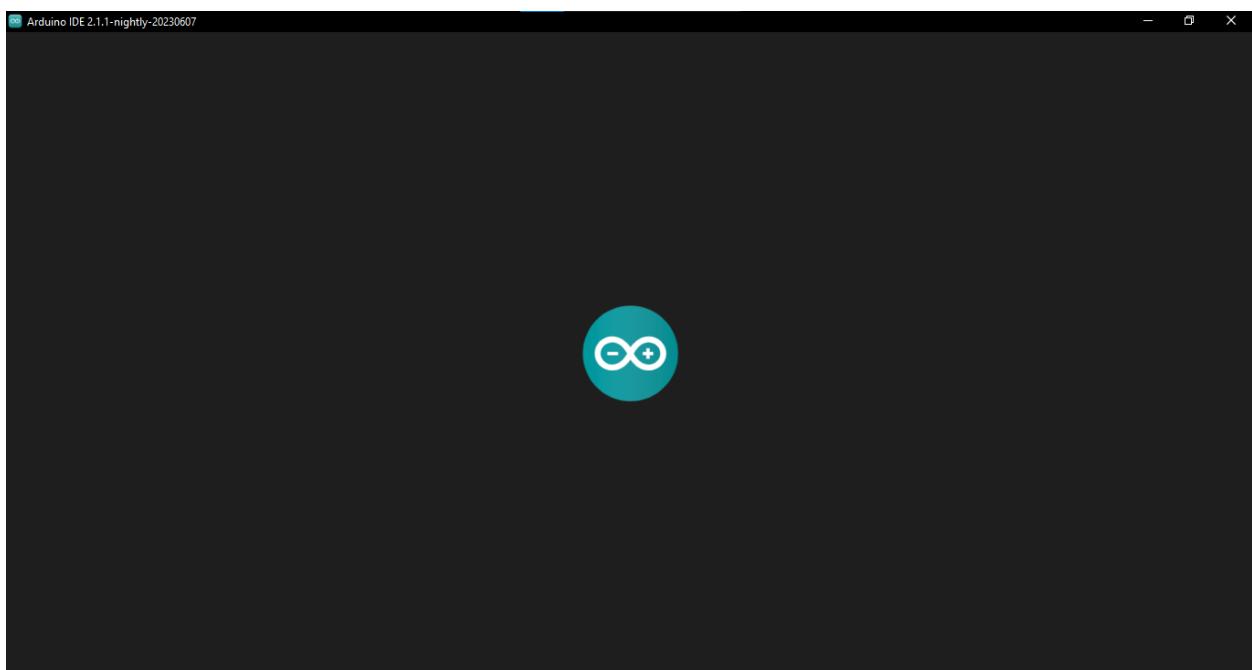


Step 8: Double click on IR Sensor and Add Library (for both)

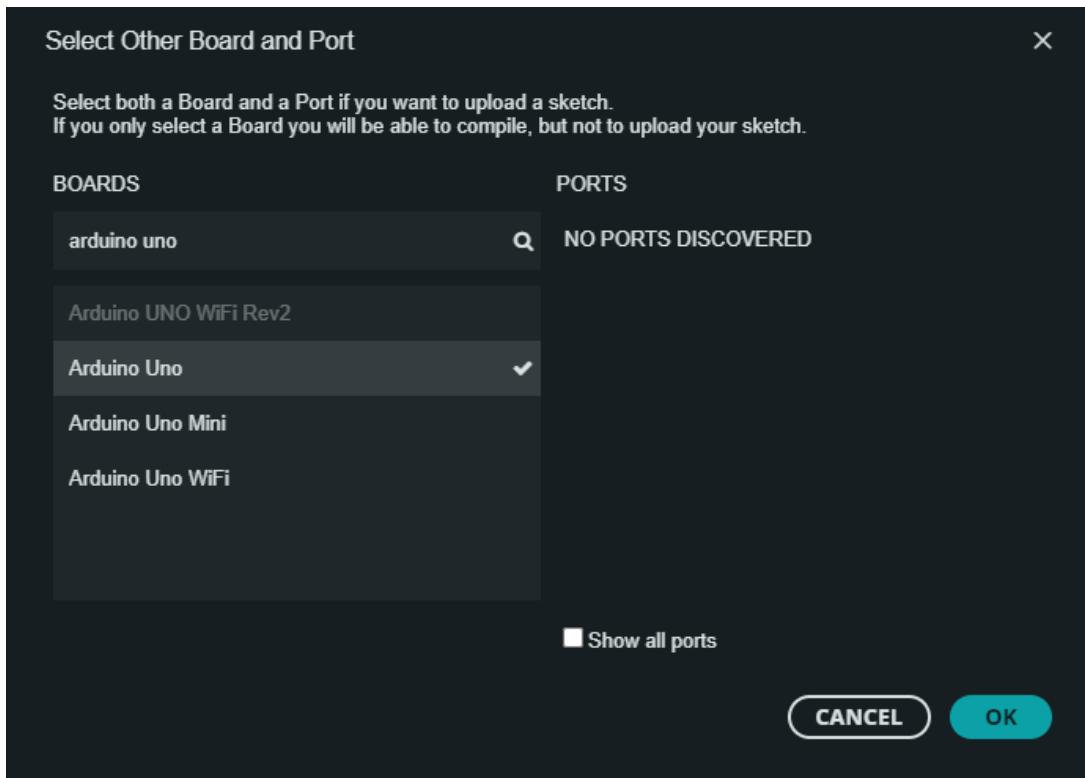




Step 9: Write a program for Arduino UNO using Arduino IDE.



Step 10: Select Arduino Uno board and Click on Ok



Step 11: Write code

```
sketch_jun8a | Arduino IDE 2.1.1-nightly-20230607
File Edit Sketch Tools Help
Arduino Uno
sketch_jun8a.ino
1 void setup() {
2     pinMode(2, INPUT);
3     pinMode(3, INPUT);
4     pinMode(10, OUTPUT);
5     pinMode(11, OUTPUT);
6     pinMode(12, OUTPUT);
7     pinMode(13, OUTPUT);
8 }
9
10 void loop() {
11     int v = digitalRead(2);
12     int s = digitalRead(3);
13     if(v == 1 and s == 1){
14         digitalWrite(13, 1);
15         digitalWrite(12, 0);
16         digitalWrite(11, 1);
17         digitalWrite(10, 0);
18     }
19     if(v == 1 and s == 0){
20         digitalWrite(13, 0);
21         digitalWrite(12, 1);
22         digitalWrite(11, 1);
23         digitalWrite(10, 0);
24     }
25     if(v == 0 and s == 1){
26         digitalWrite(13, 1);
27         digitalWrite(12, 0);
28         digitalWrite(11, 0);
29         digitalWrite(10, 1);
30     }
31     if(v == 0 and s == 0){
```

Ln 37, Col 2 Arduino Uno [not connected]

Code:

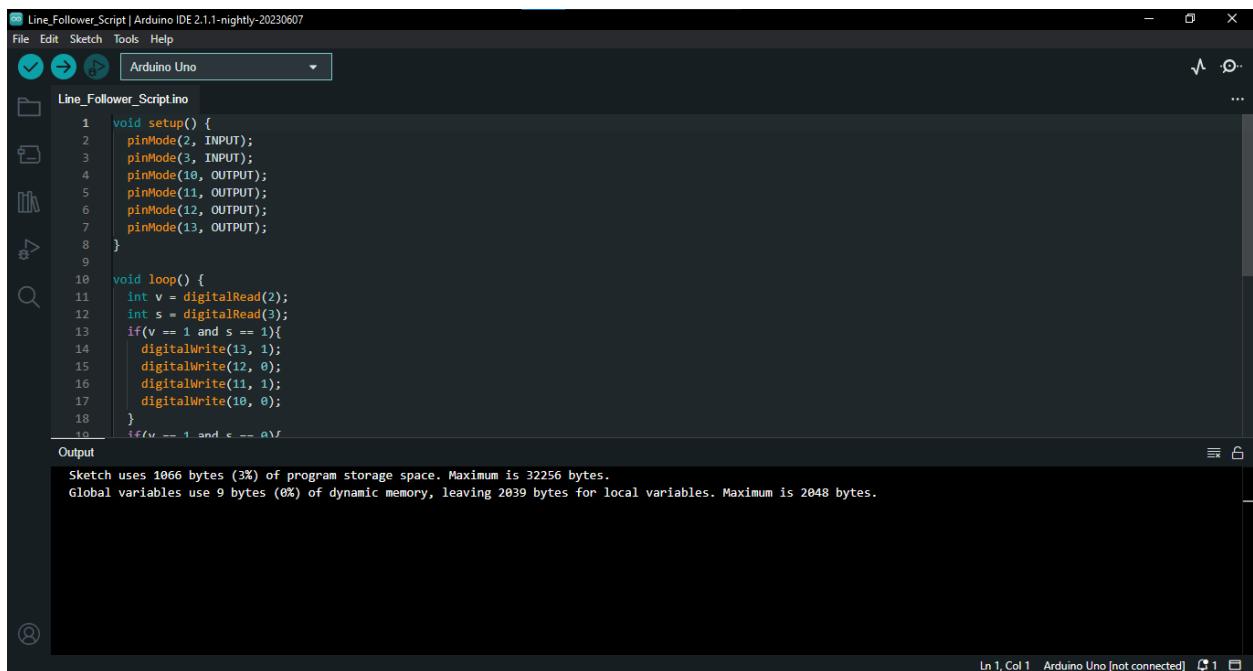
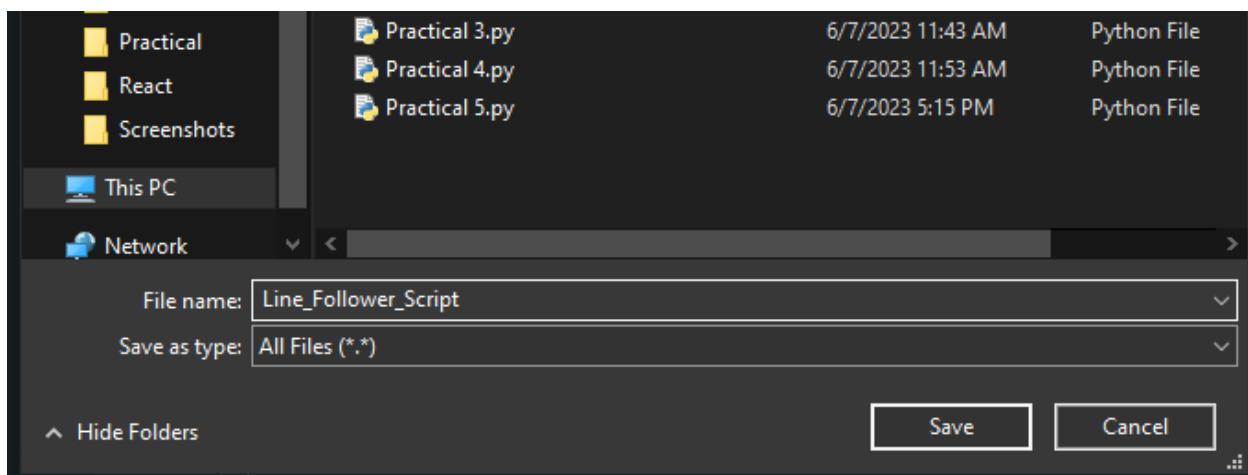
```
void setup() {  
    pinMode(2, INPUT);  
    pinMode(3, INPUT);  
    pinMode(10, OUTPUT);  
    pinMode(11, OUTPUT);  
    pinMode(12, OUTPUT);  
    pinMode(13, OUTPUT);  
}  
  
void loop() {  
    int v = digitalRead(2);  
    int s = digitalRead(3);  
    if(v == 1 and s == 1){  
        digitalWrite(13, 1);  
        digitalWrite(12, 0);  
        digitalWrite(11, 1);  
        digitalWrite(10, 0);  
    }  
    if(v == 1 and s == 0){  
        digitalWrite(13, 0);  
        digitalWrite(12, 1);  
        digitalWrite(11, 1);  
        digitalWrite(10, 0);  
    }  
    if(v == 0 and s == 1){  
        digitalWrite(13, 1);  
        digitalWrite(12, 0);  
        digitalWrite(11, 0);  
        digitalWrite(10, 1);  
    }  
}
```

```

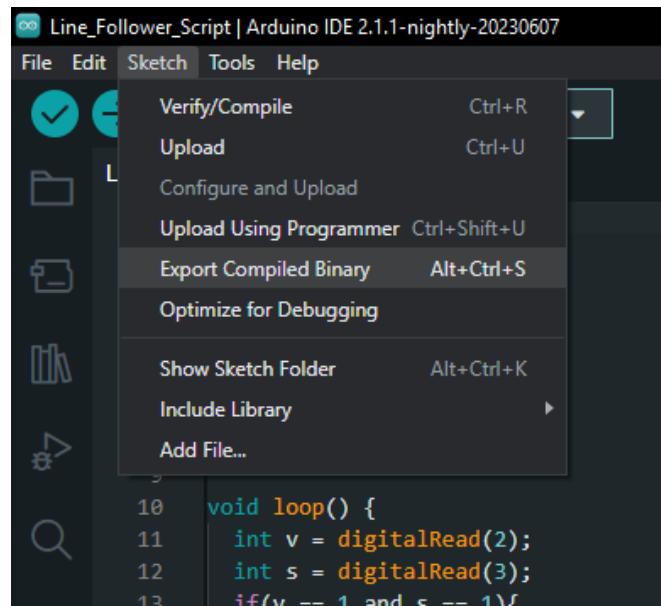
if(v == 0 and s == 0) {
    digitalWrite(13, 0);
    digitalWrite(12, 1);
    digitalWrite(11, 0);
    digitalWrite(10, 1);
}
}

```

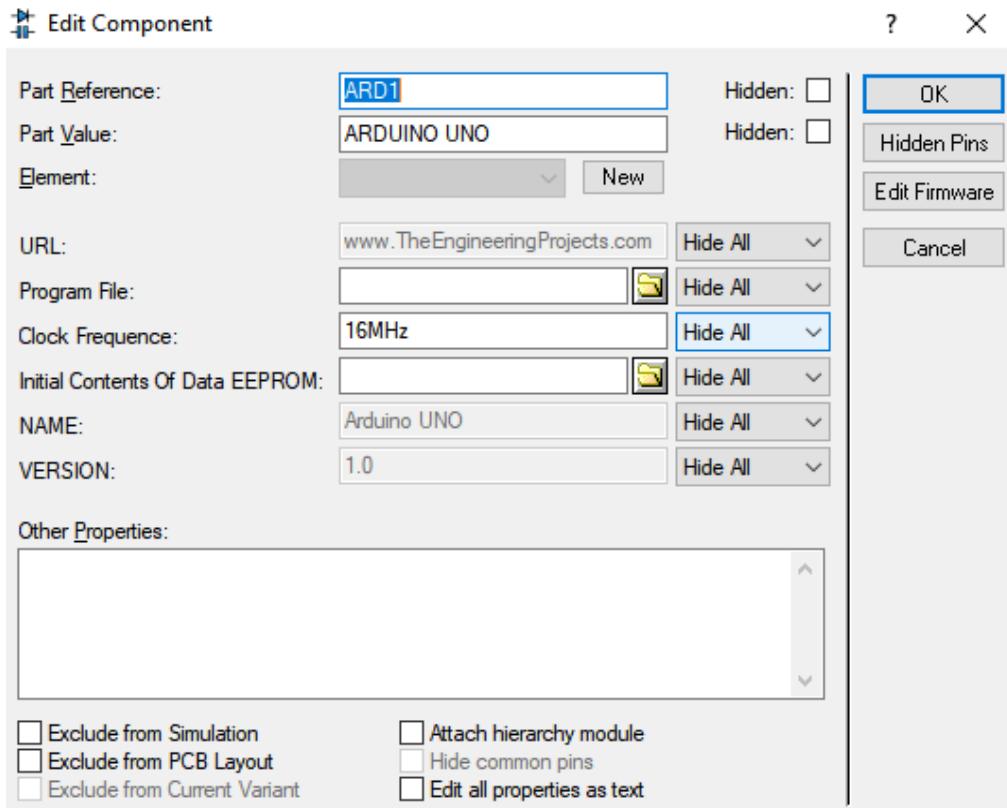
Step 12: Save the code and Click on verify

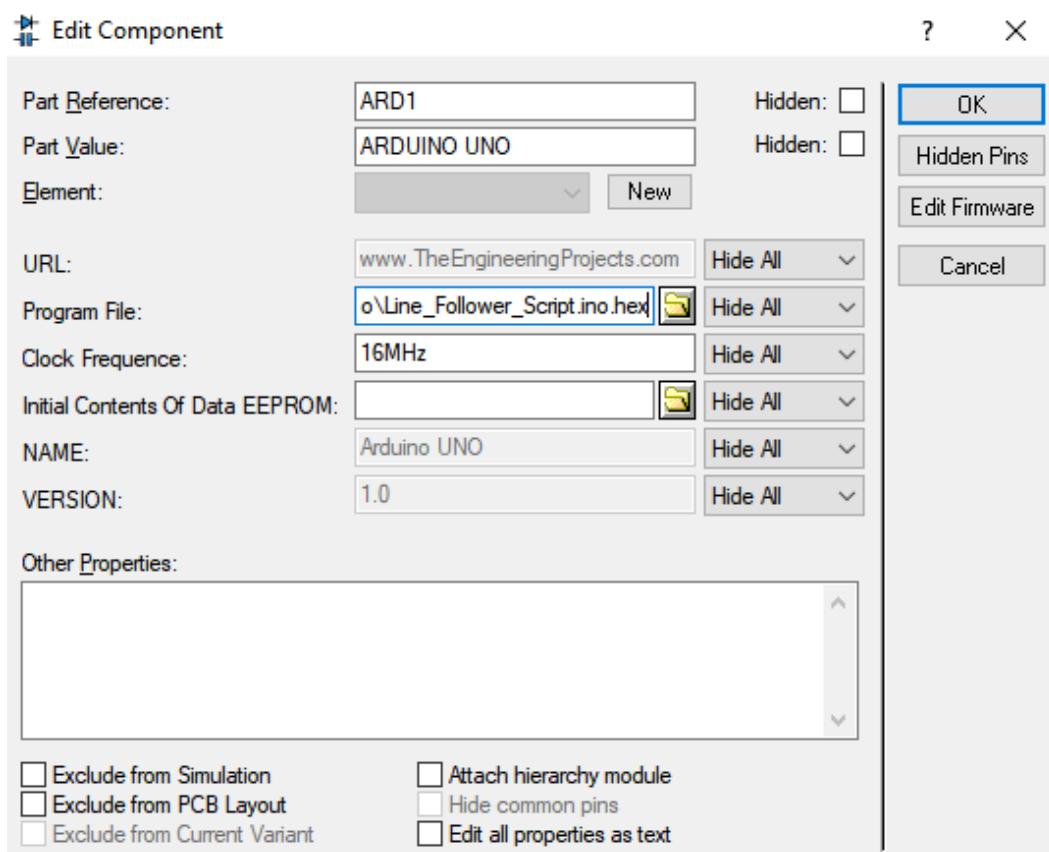
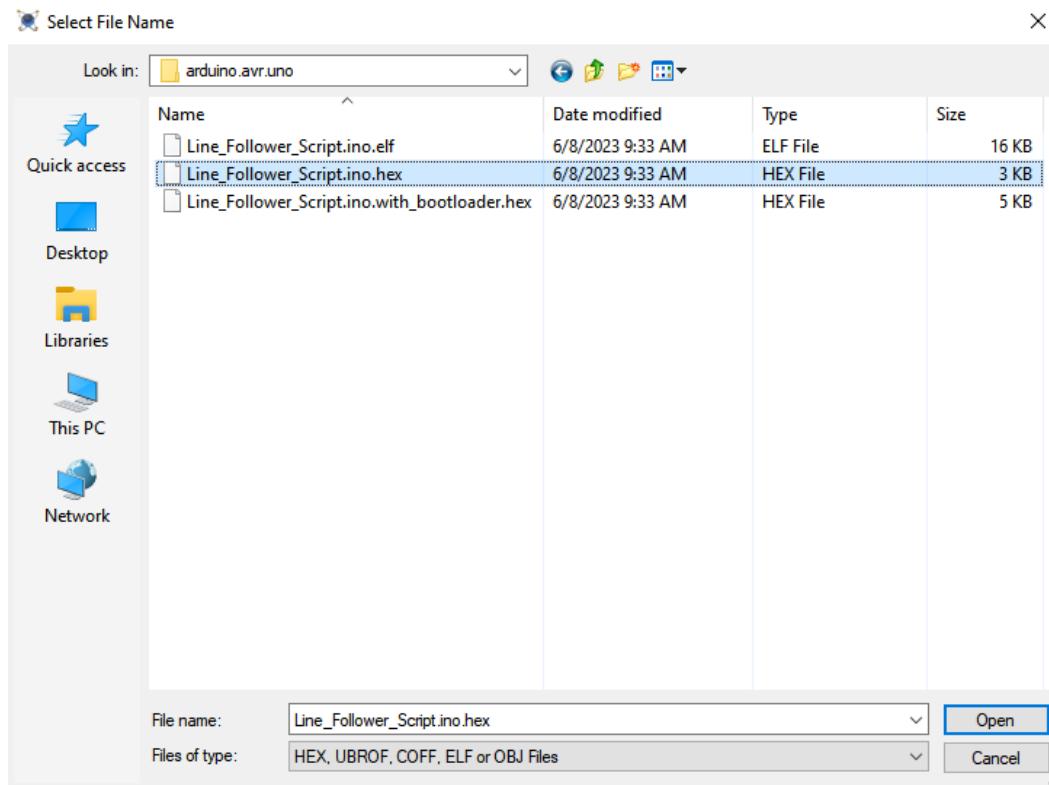


Step 13: Go to Sketch and select Export Compile Binary

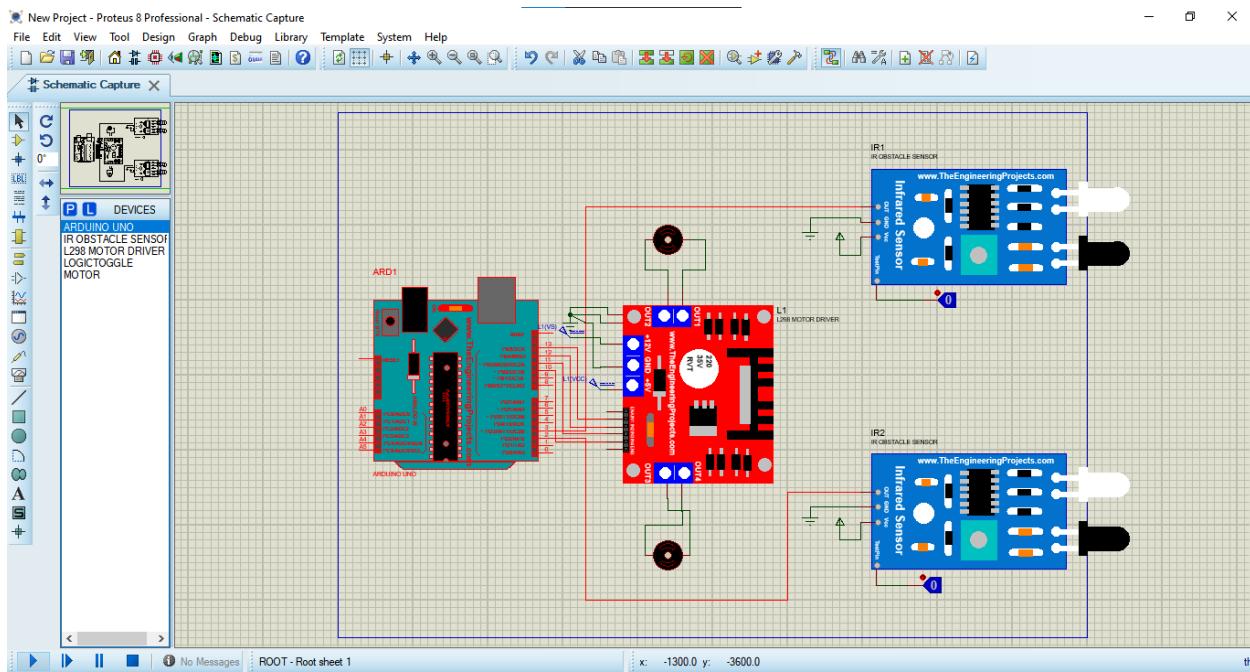


Step 14: Go to Proteus and Double click on Arduino UNO and browse Program file and select Exported Compile Binary File

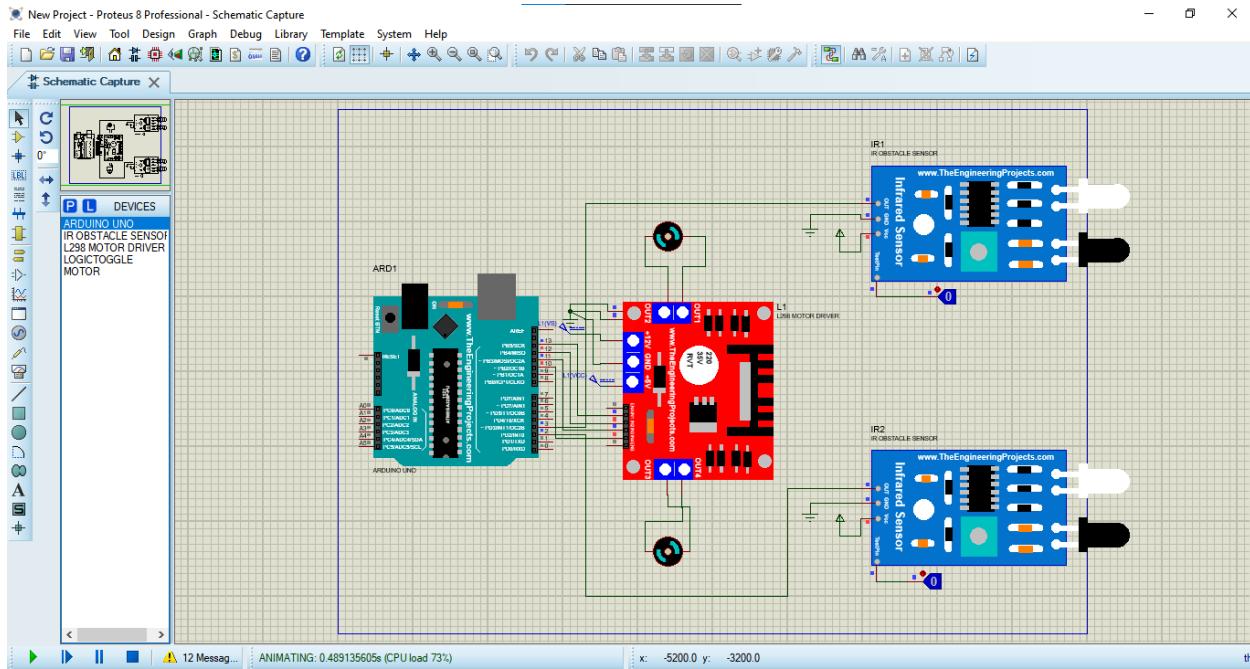




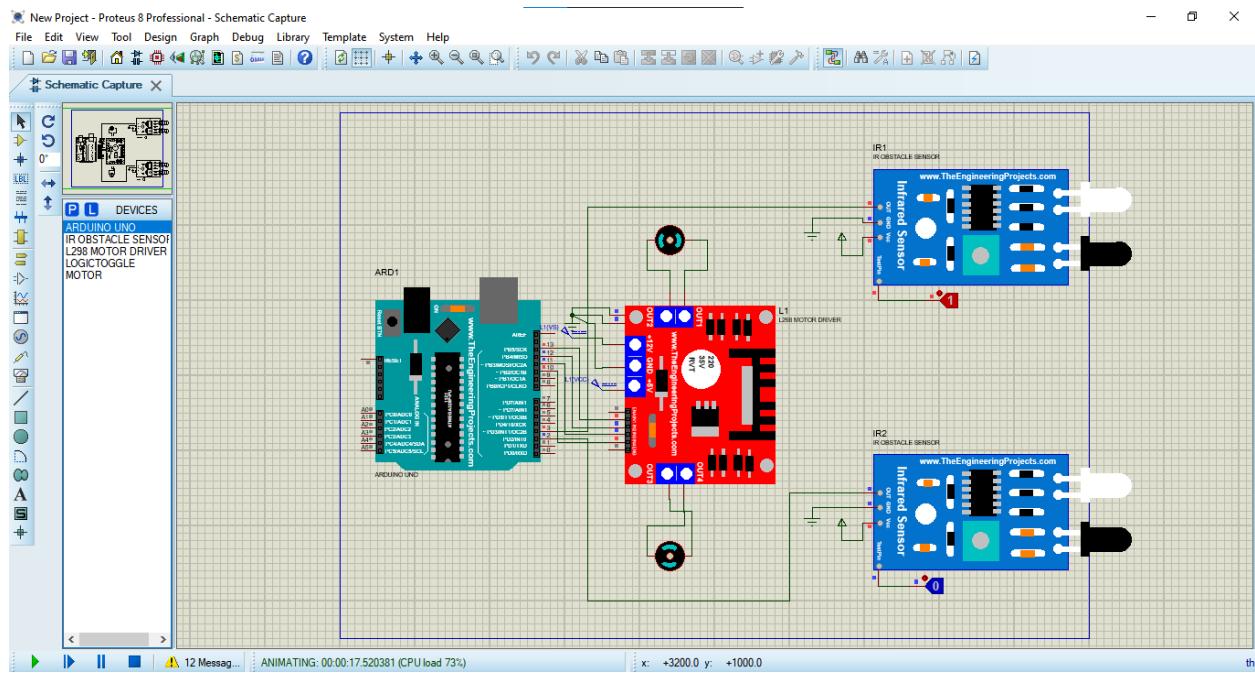
Step 15: Click on Run Simulate Button



Motor is start rotating



And it toggle to 1 Motor run in Clockwise direction



Practical No. 7

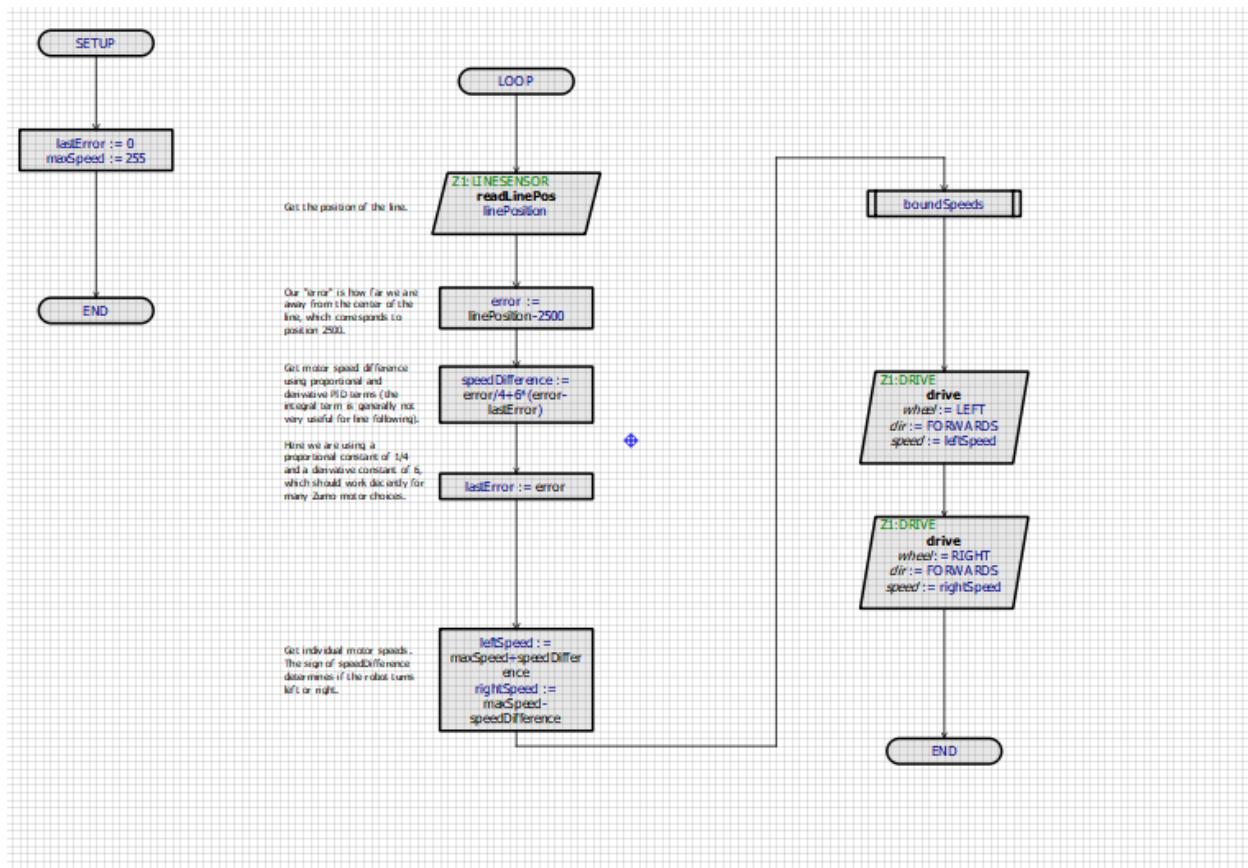
Aim: Add the sensors to the robot object and develop the line follower behavior code

Components Used:

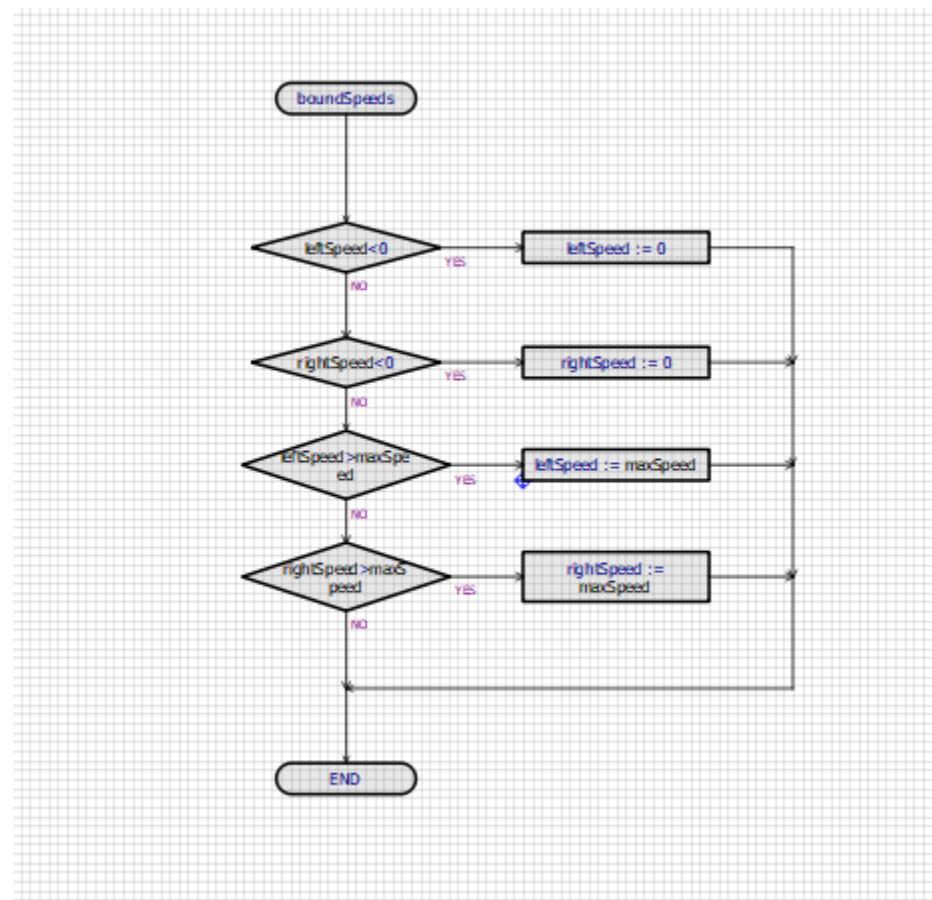
1. Arduino
2. Button
3. Zumo robot

Flow Chart:

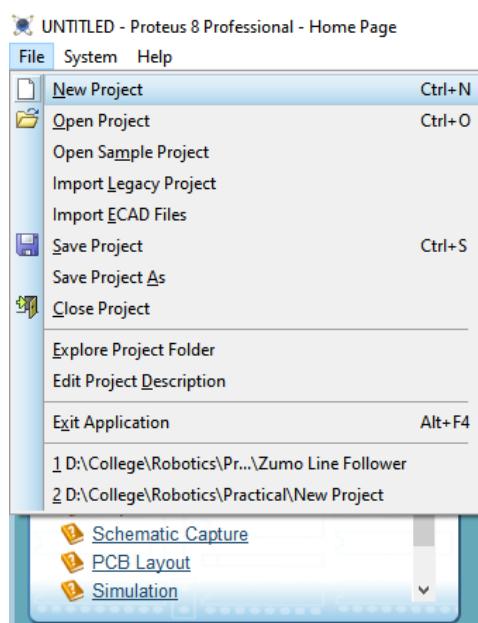
Main

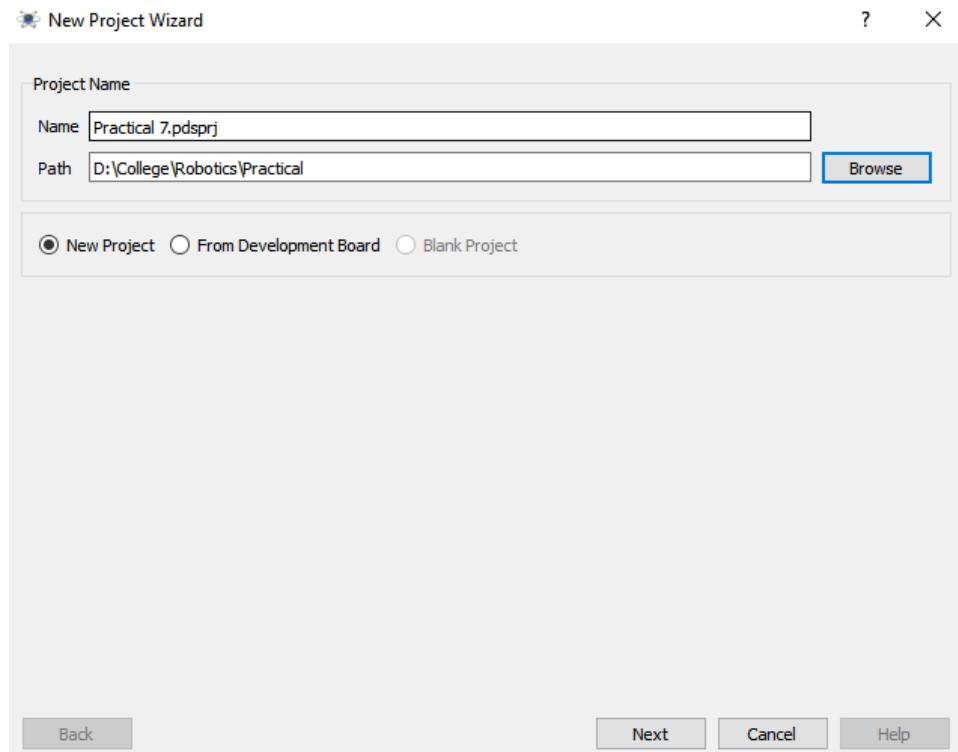


Subroutine

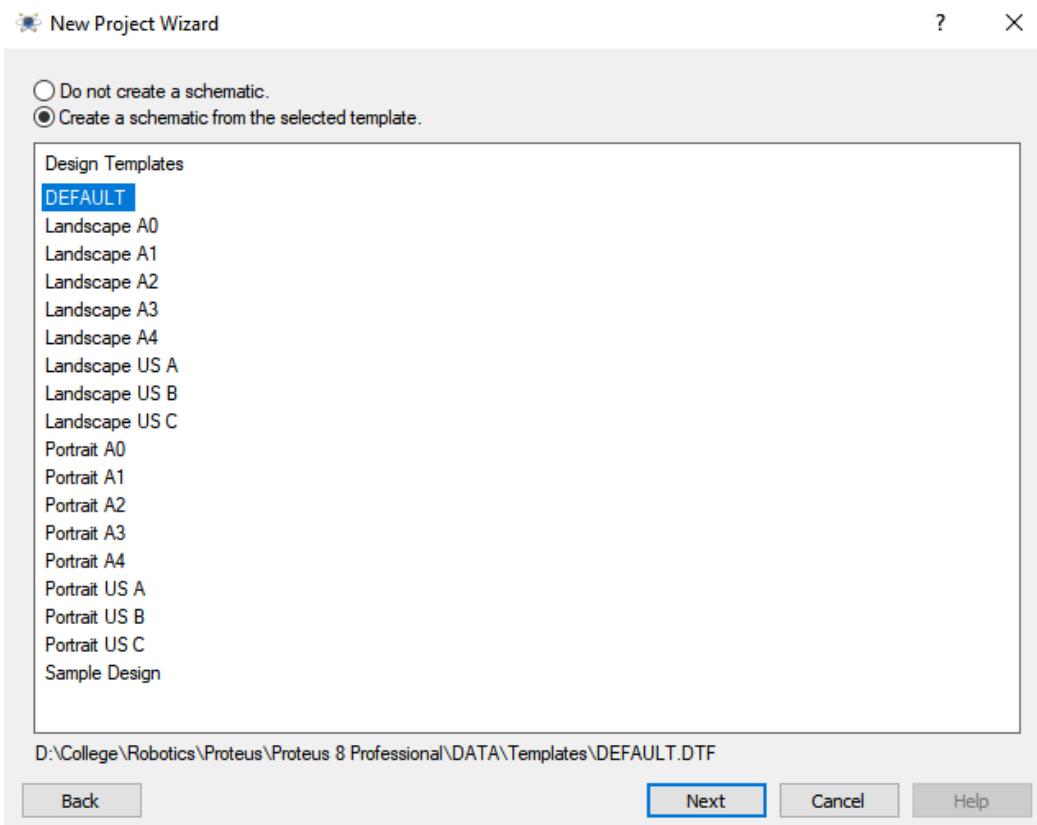


Step 1: Open Proteus > Click on File > Click on New Project

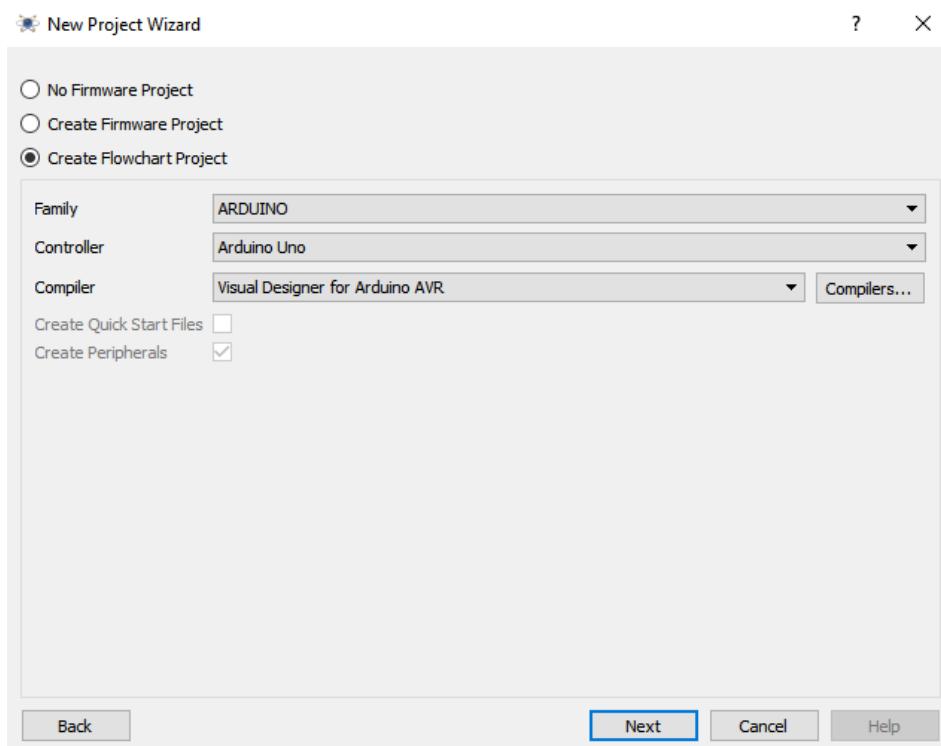




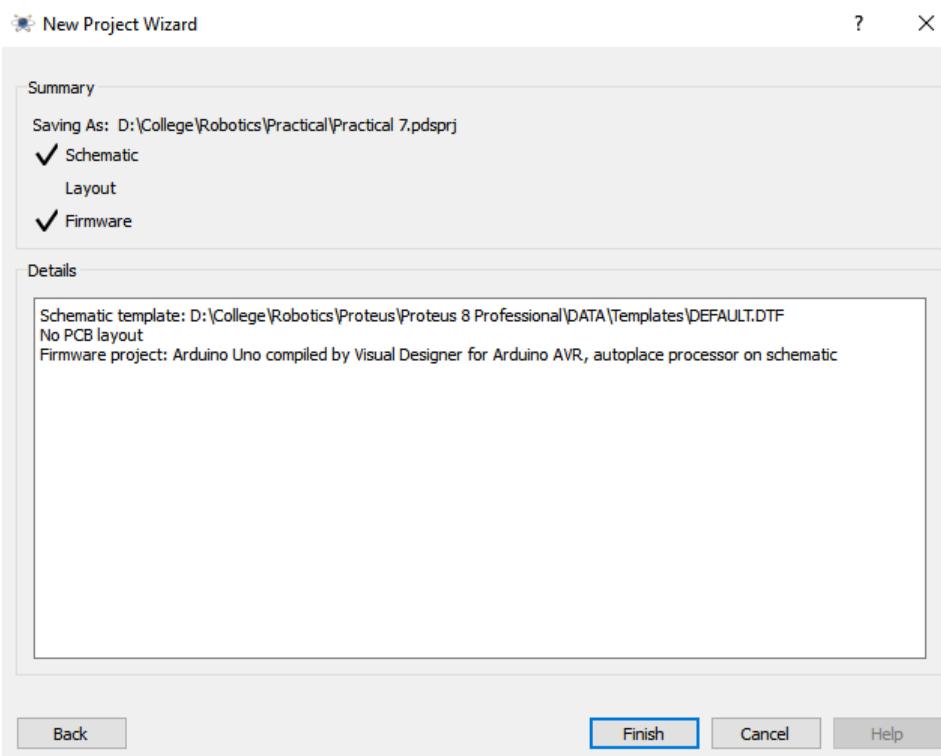
Set it to Default and Click on Next



Now Select Create Flowchart Project option

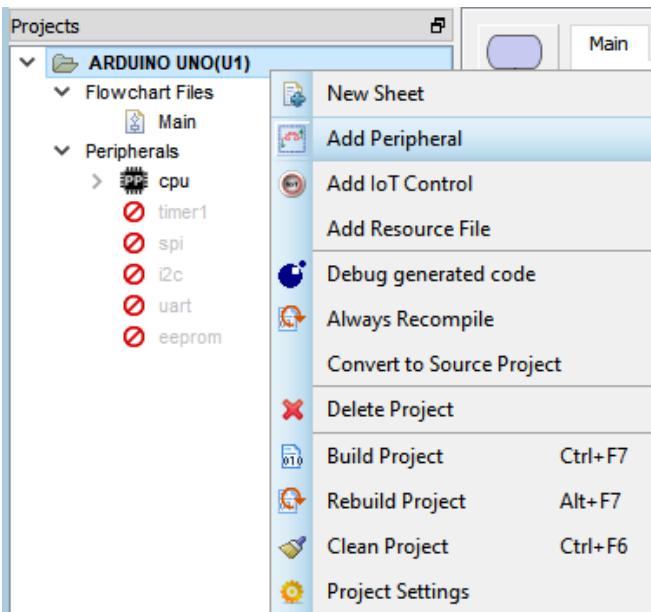


Then Click on Finish

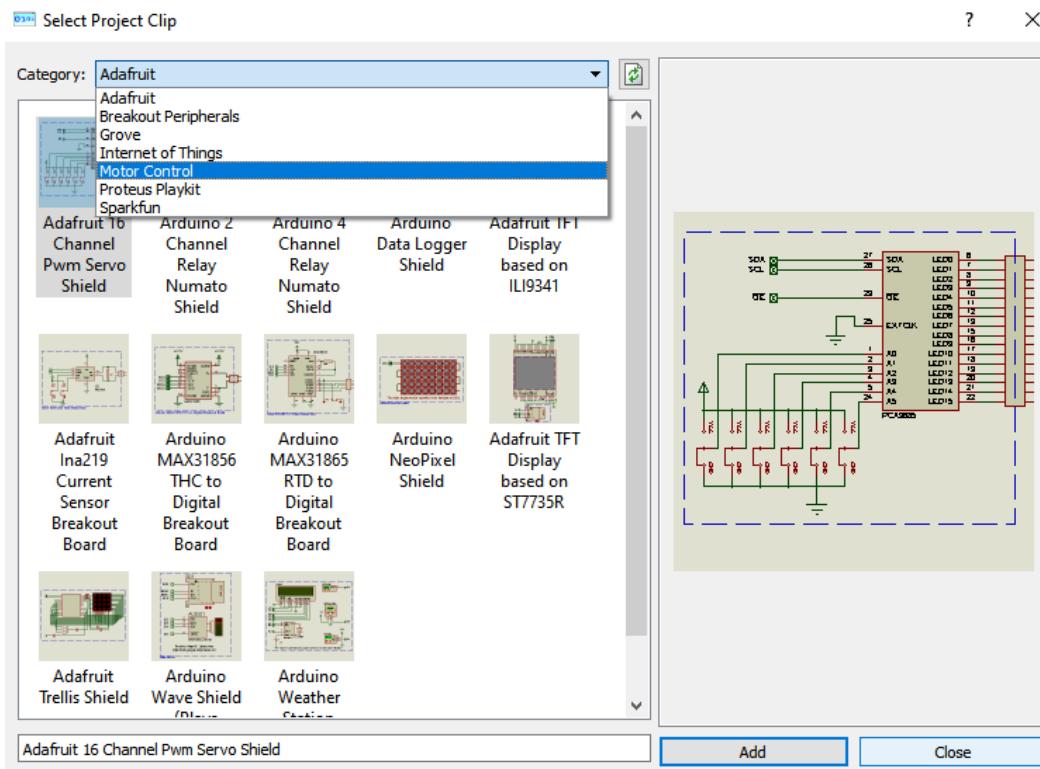


Step 2: Add Arduino Zumo Robot

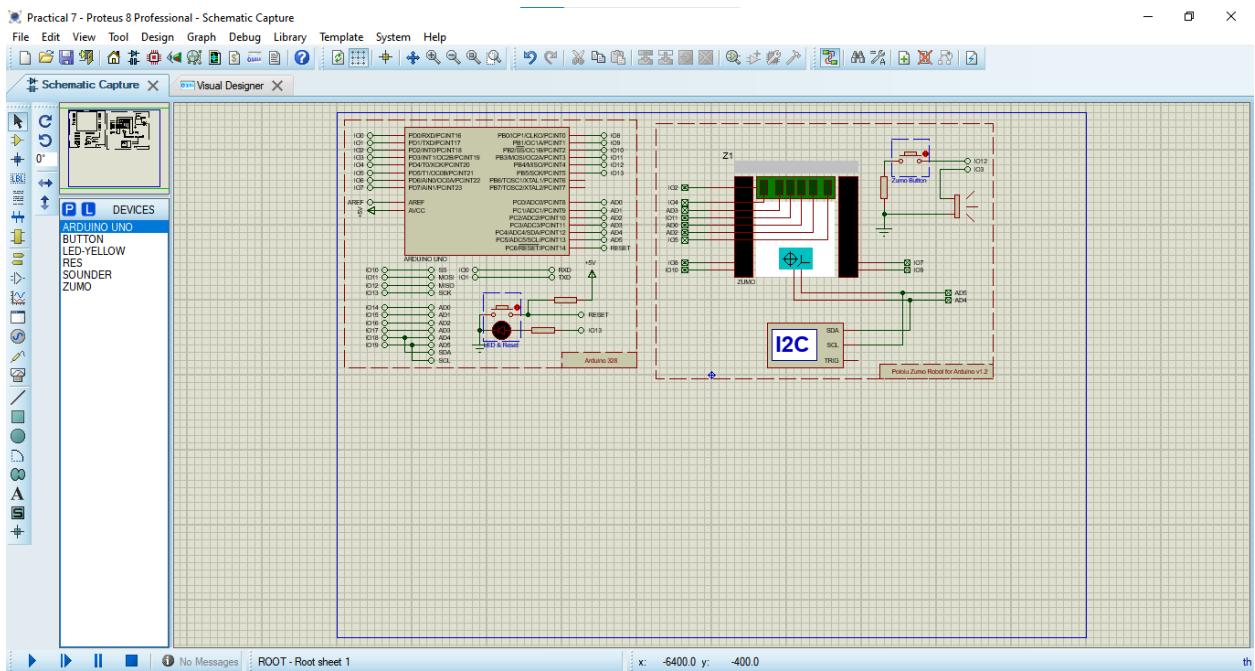
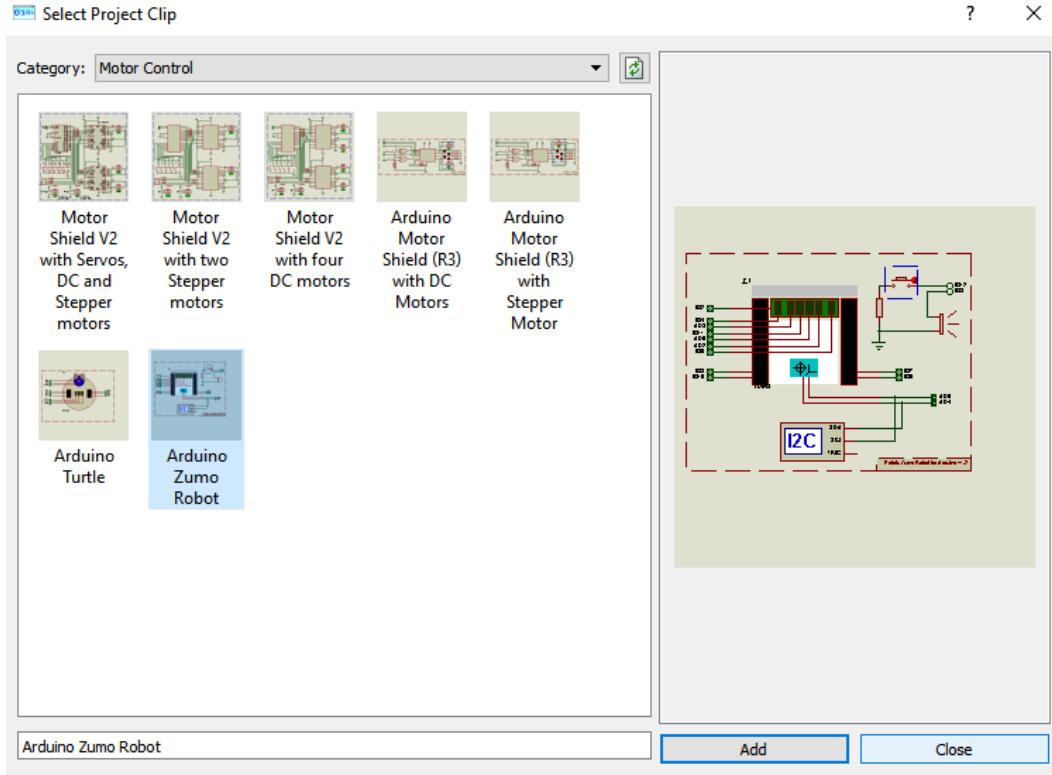
Right click on Project Name -> Click on Add Peripherals



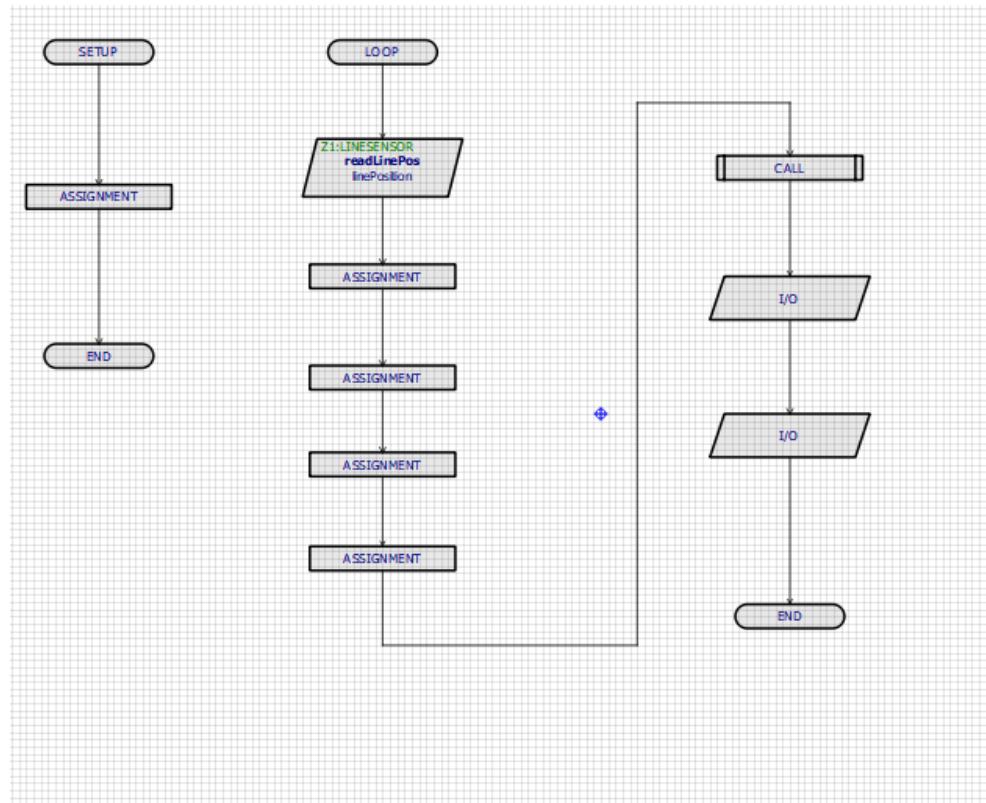
From Dropdown -> Select Motor Control



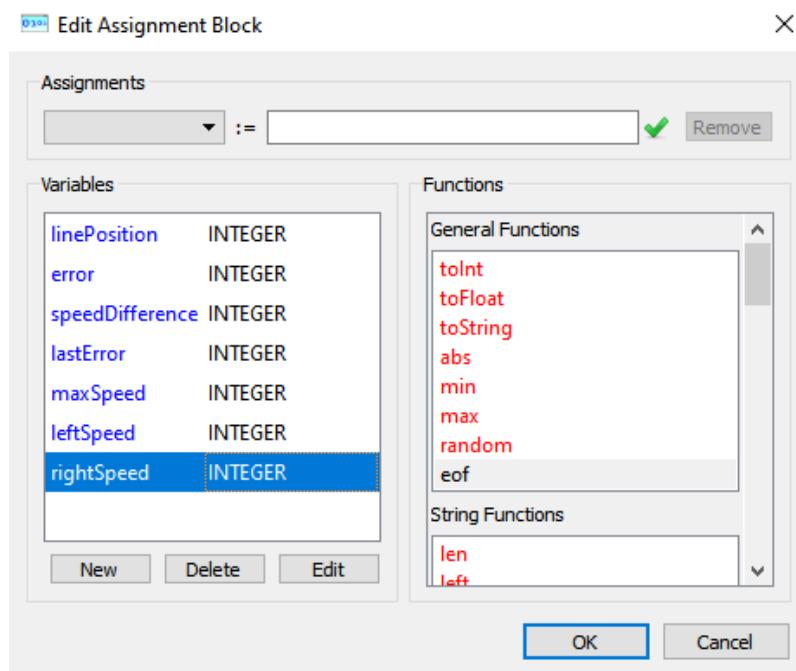
And then Select Arduino Zumo Robot and Click on Add



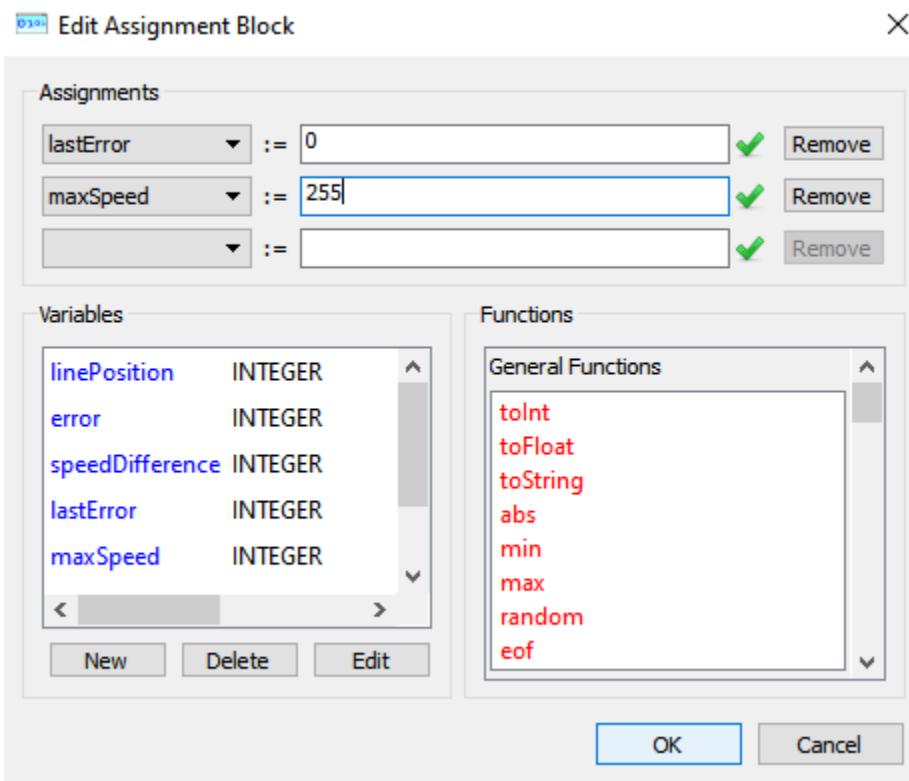
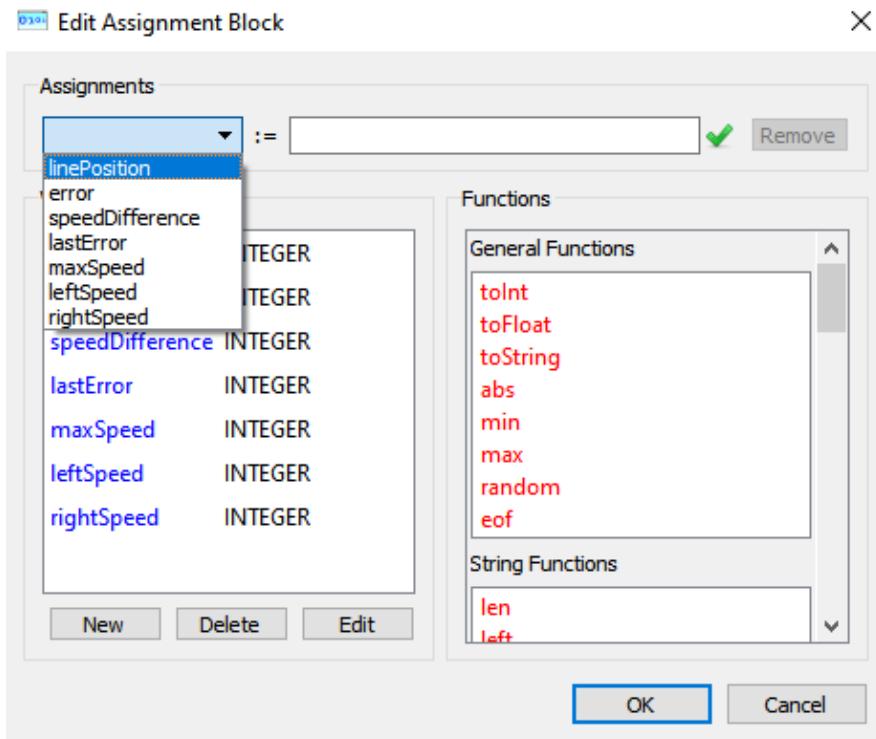
Step 3: Click on Visual Design and create Flow Chart



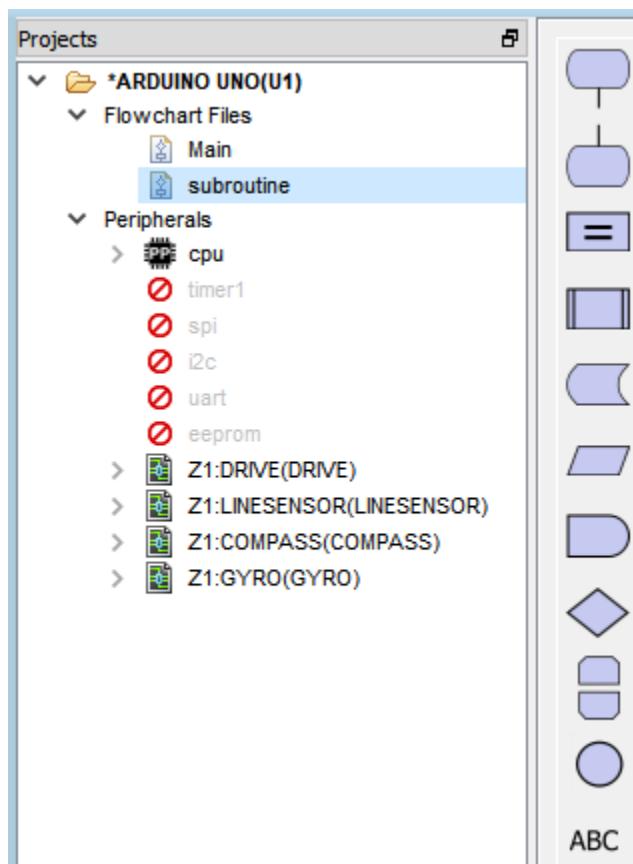
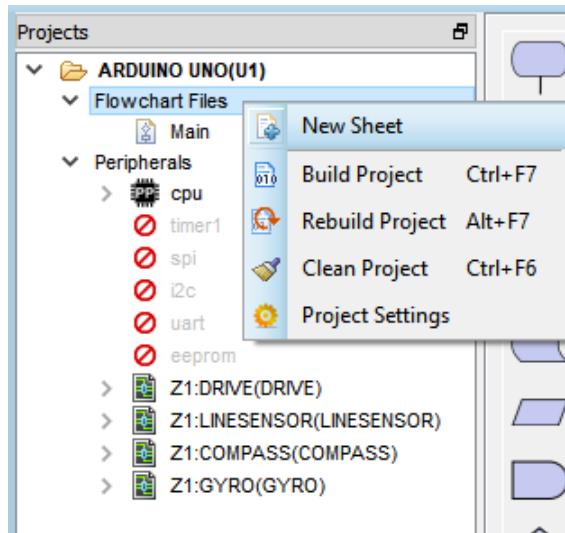
Step 4: Add variables



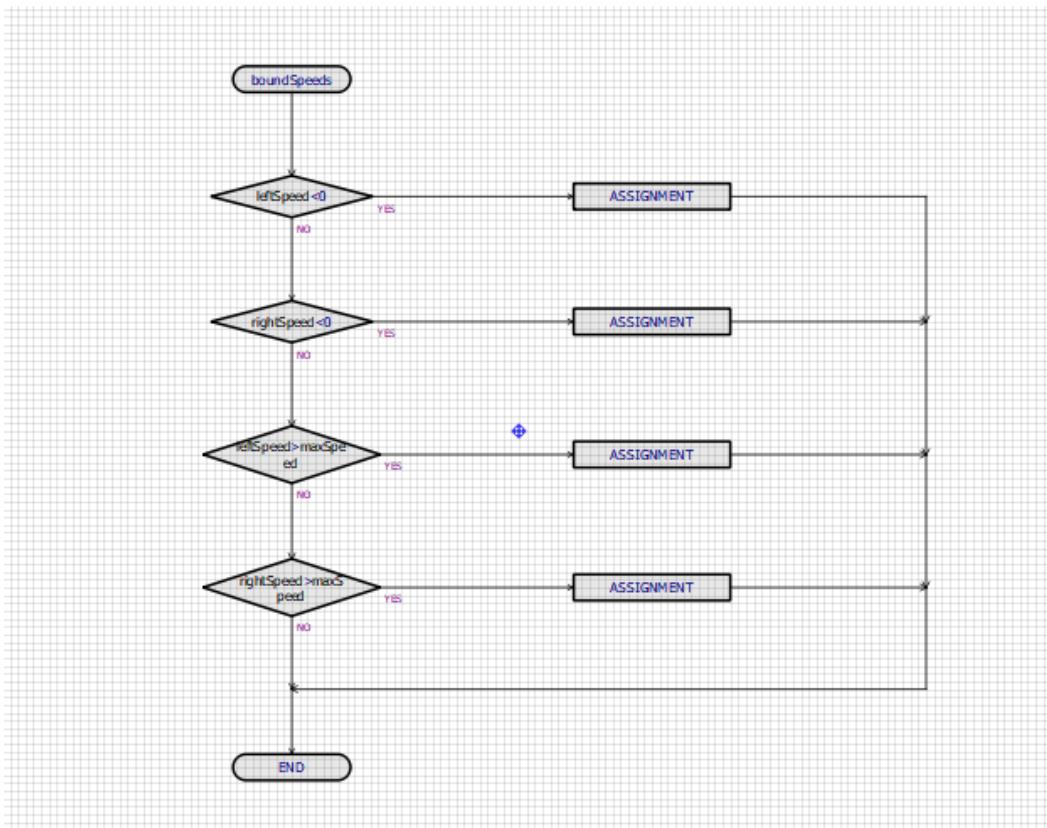
Step 5: Now set Assignments



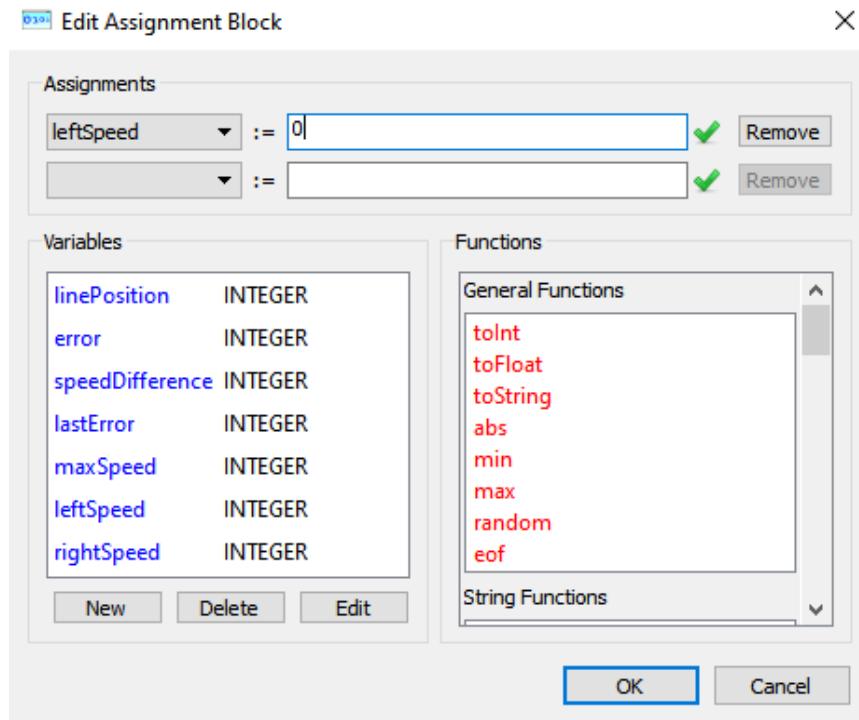
Step 6: Right click on Flowchart Files -> Click on New Sheet



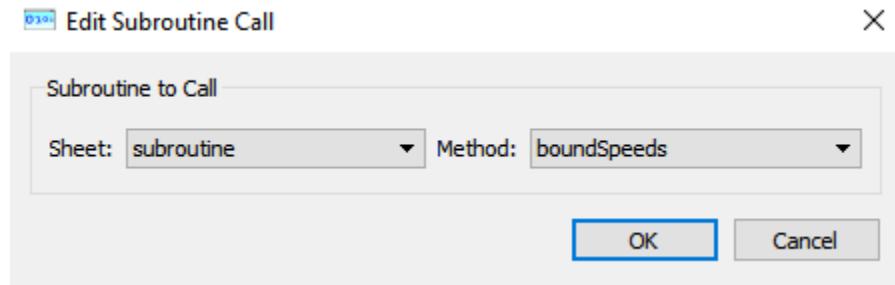
And create flow chart



Then Add Assignments

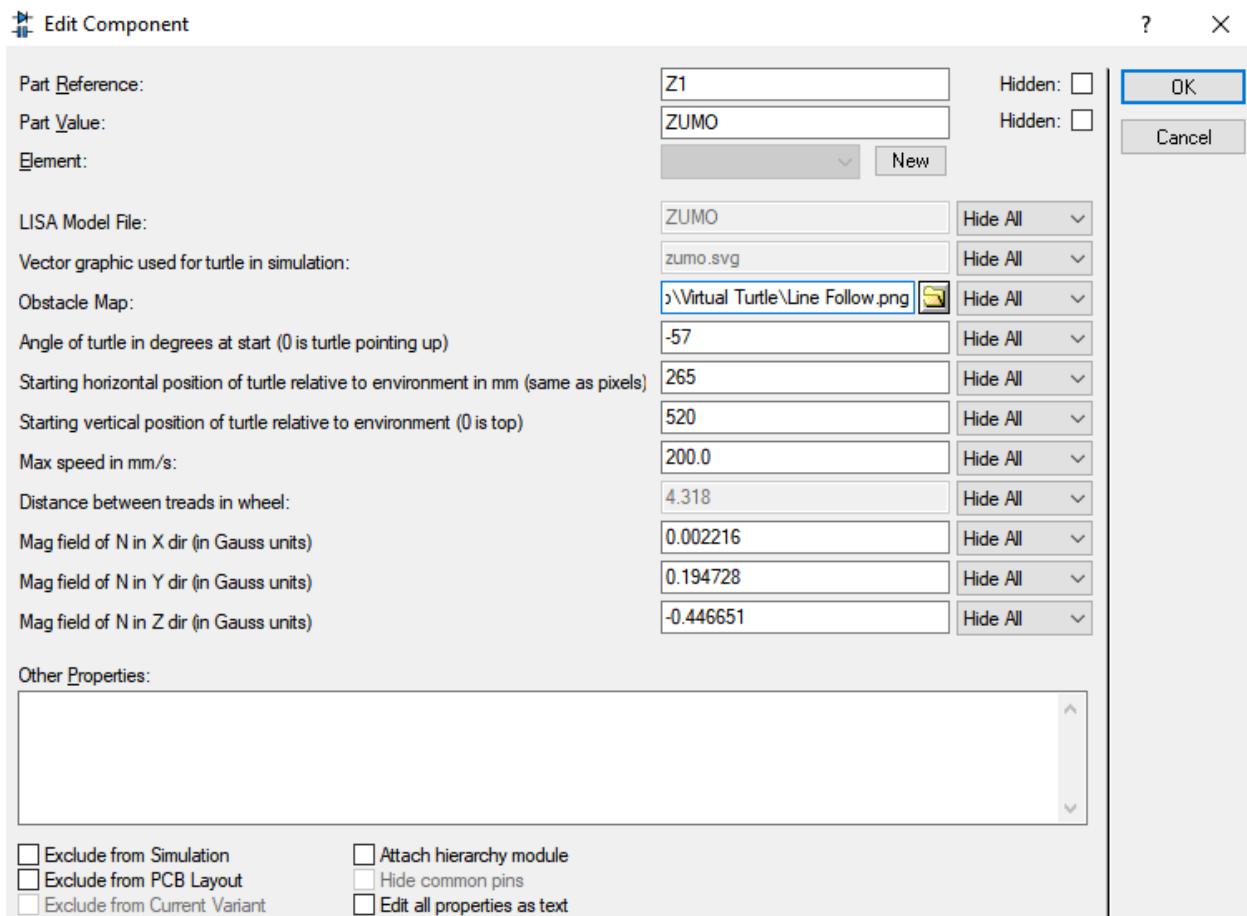


In first flow chart -> Add subroutine call

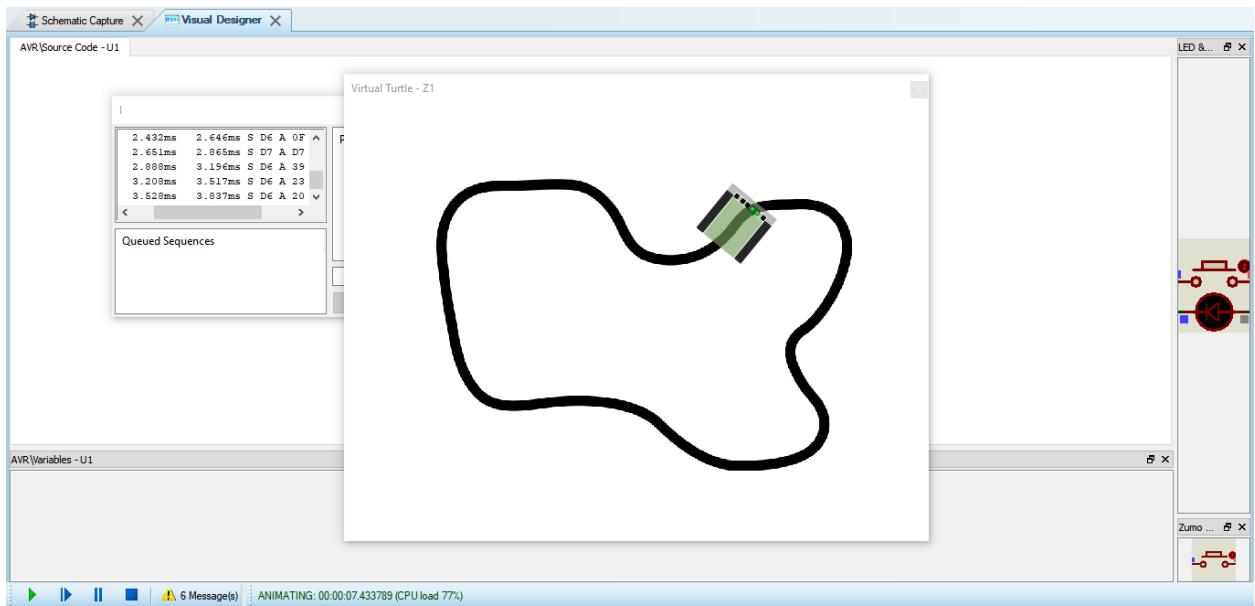


Step 7: Double click on Zumo Z1

- Add Obstacle Map
- Set Angle of turtle in degree to -57
- Set Starting horizontal position to 265
- Set Starting vertical position to 520
- and then click on Ok



Step 8: Click on Run Simulation Button



Practical No. 8

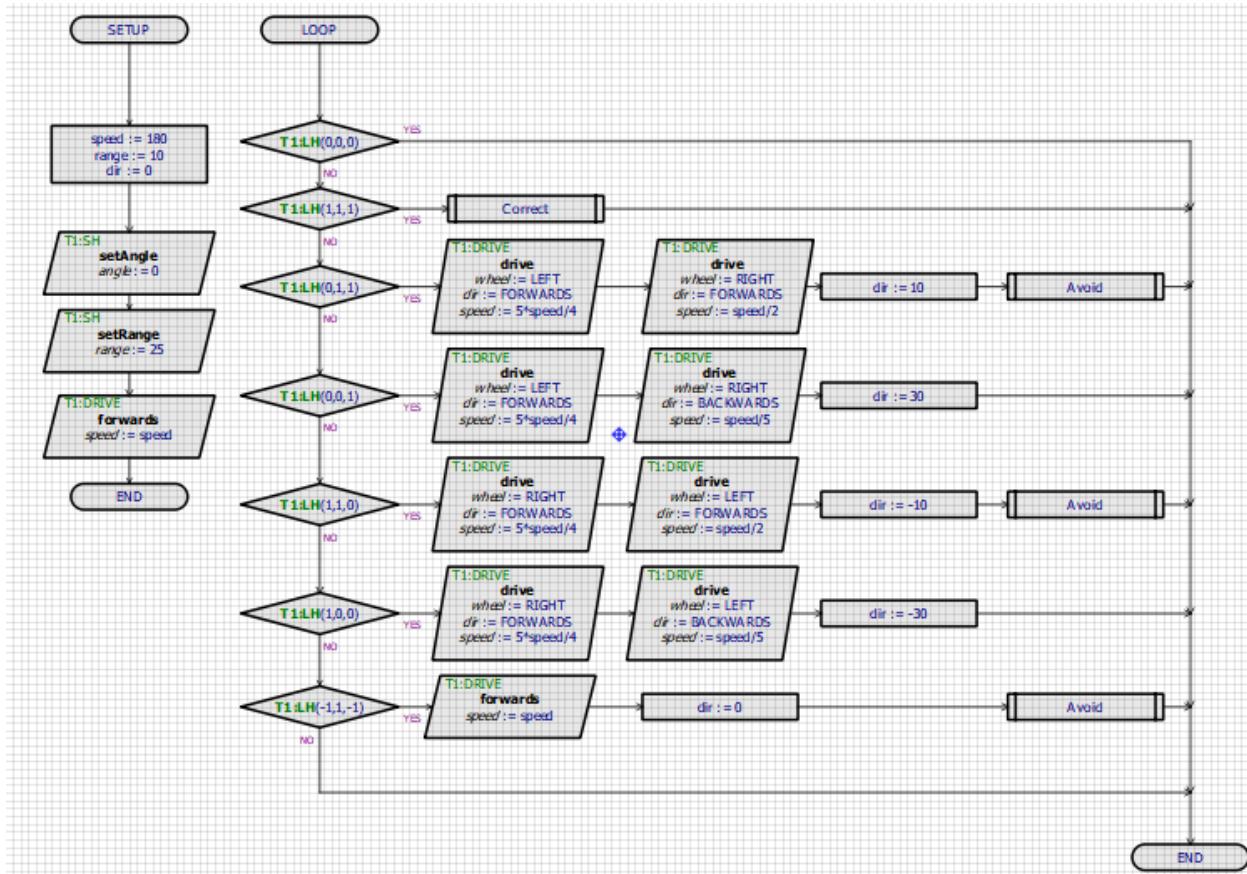
Aim: Virtual turtle Follow and Avoid

Components Used:

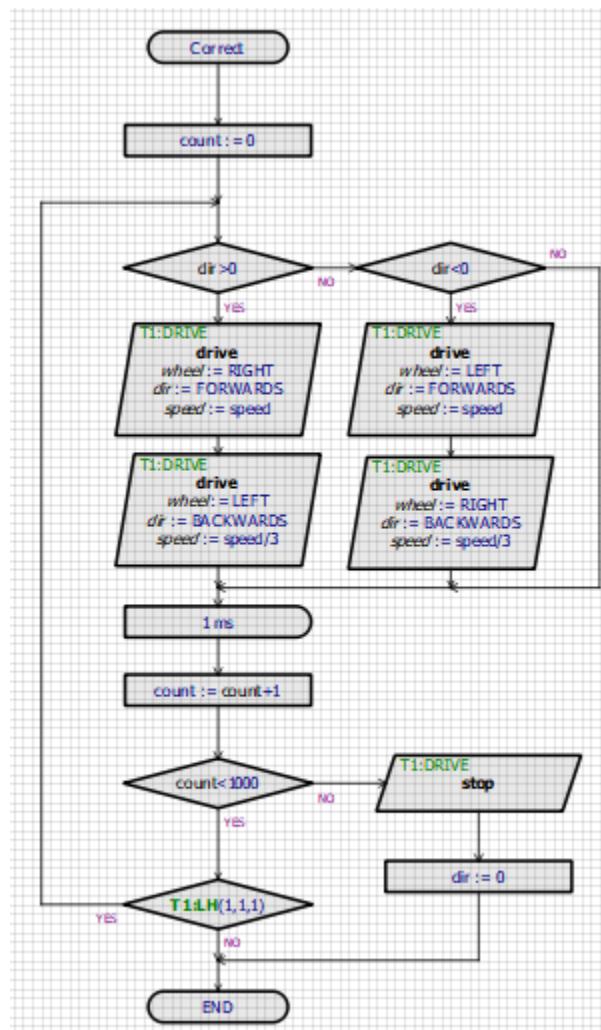
1. Arduino UNO
2. Arduino Turtle

Flow Chart:

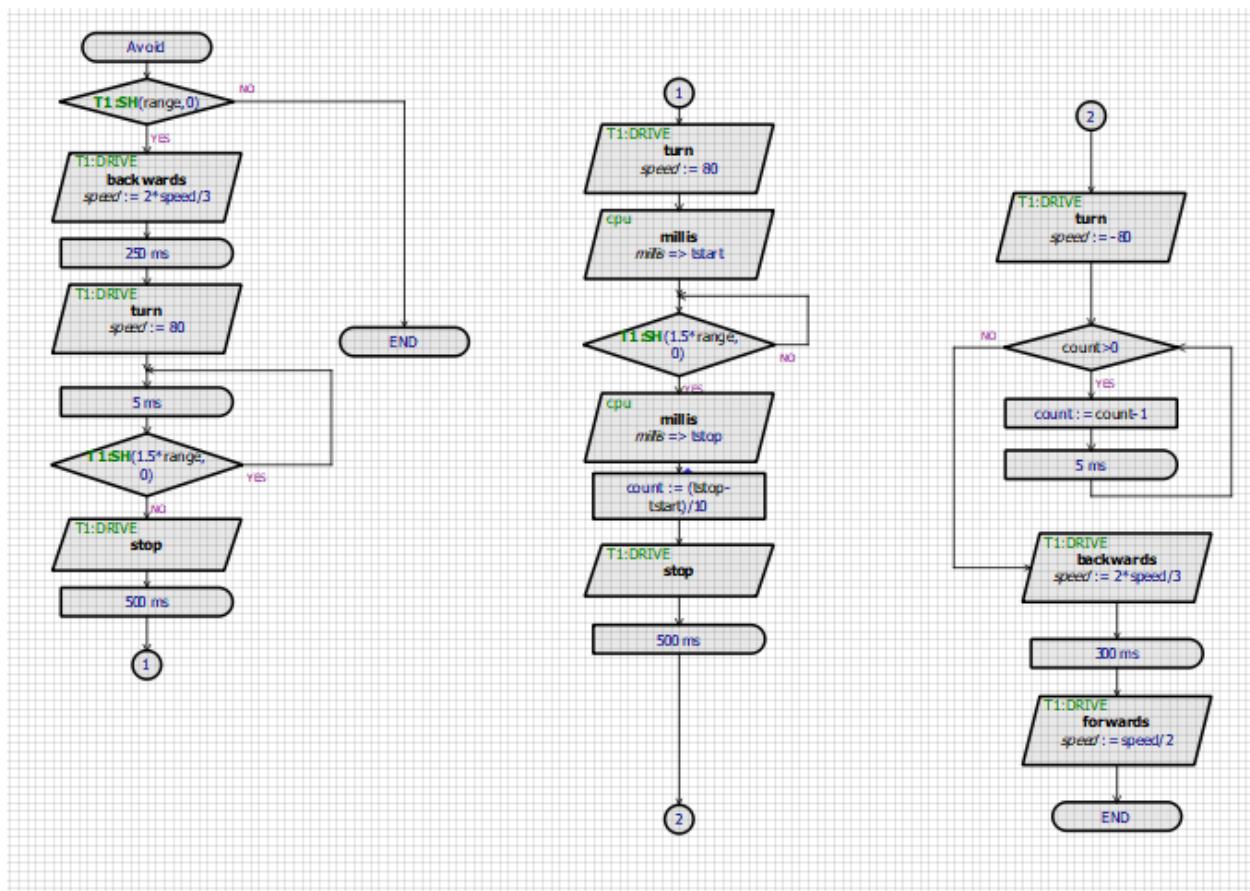
Main



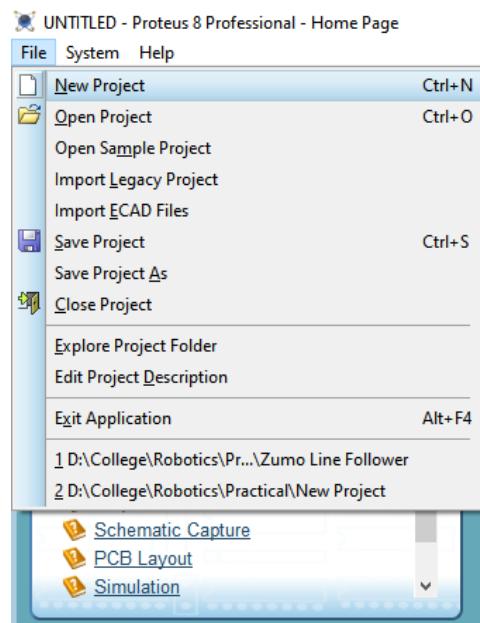
Correct

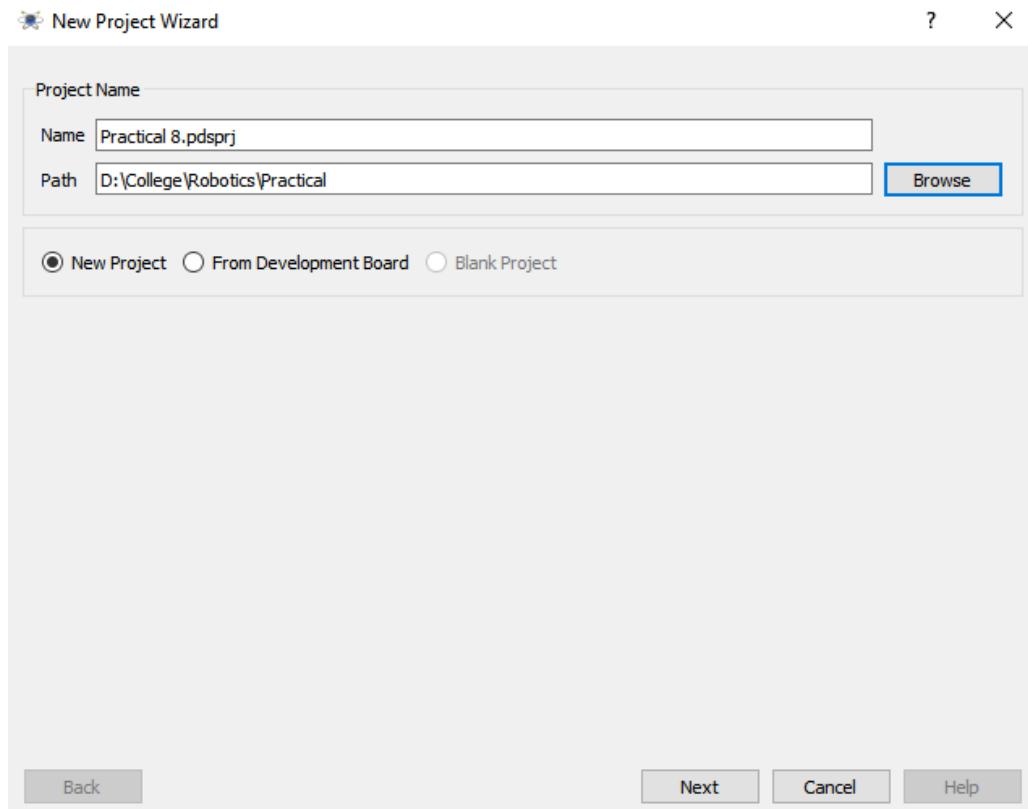


Avoid

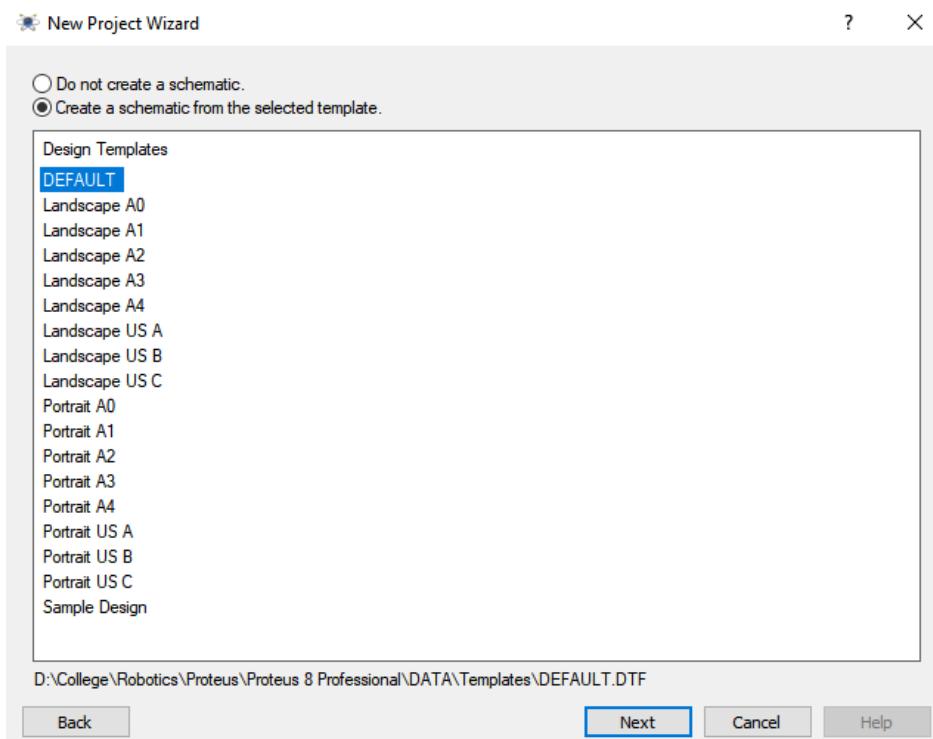


Step 1: Open Proteus > Click on File > Click on New Project

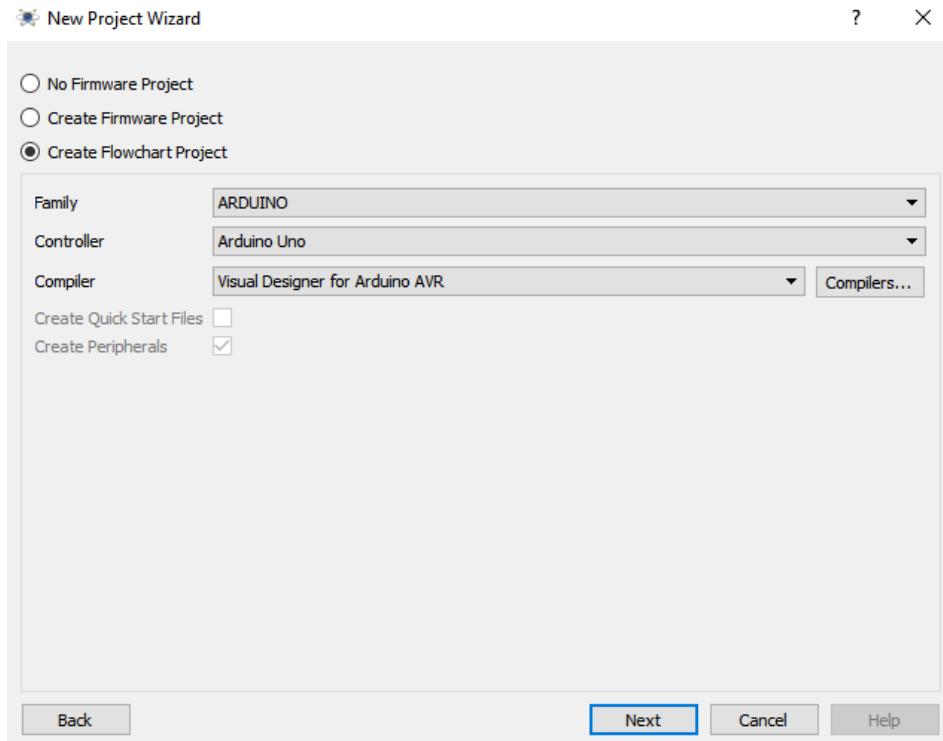




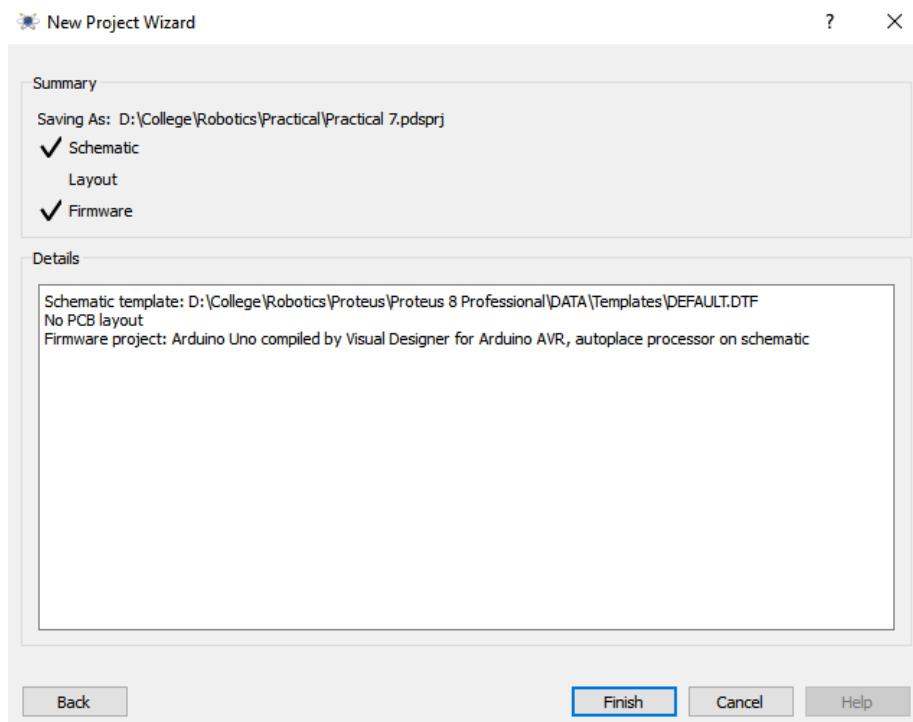
Set it to Default and Click on Next



Now Select Create Flowchart Project option

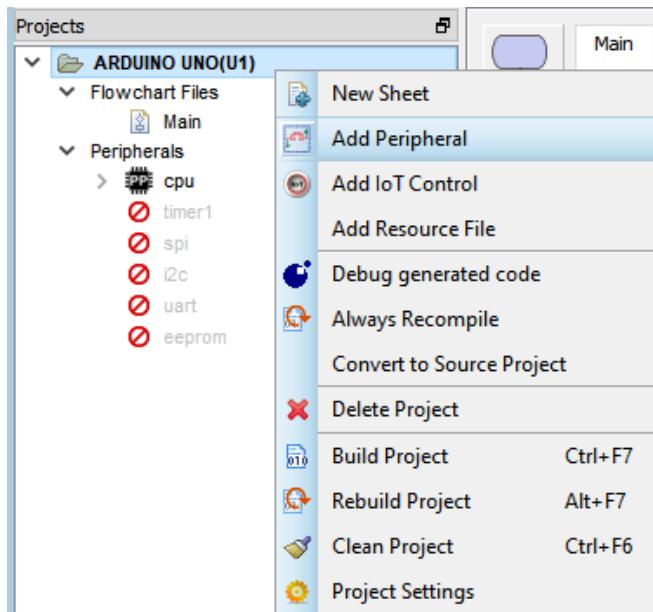


Then Click on Finish

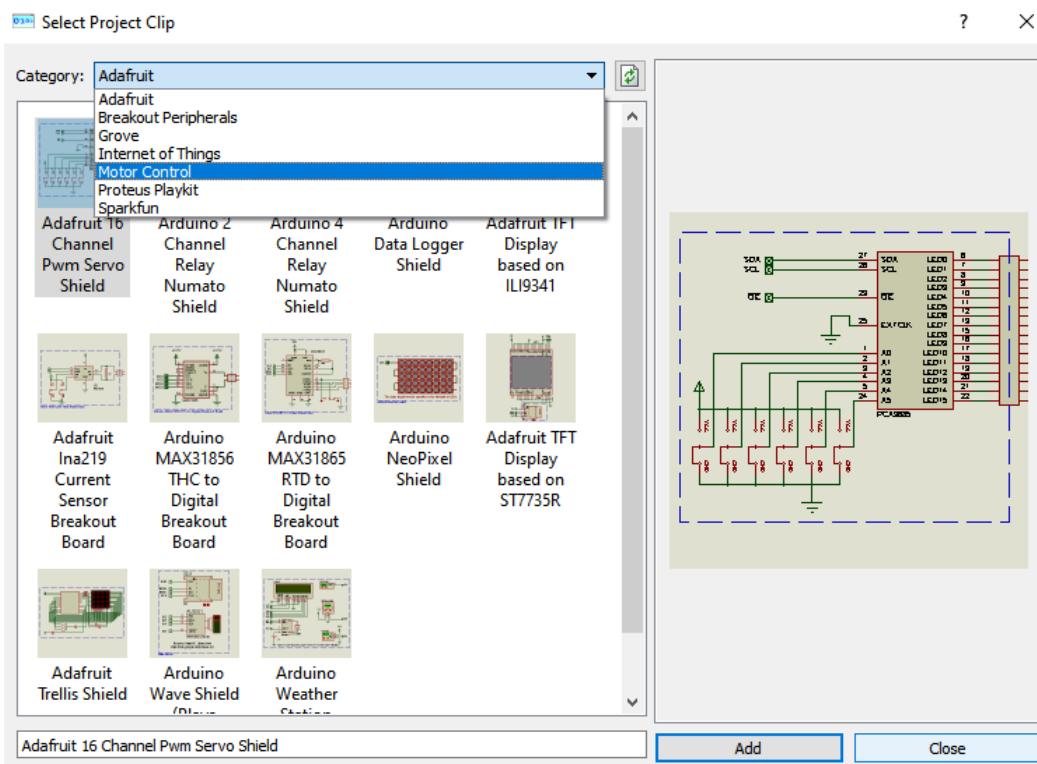


Step 2: Add Arduino Turtle

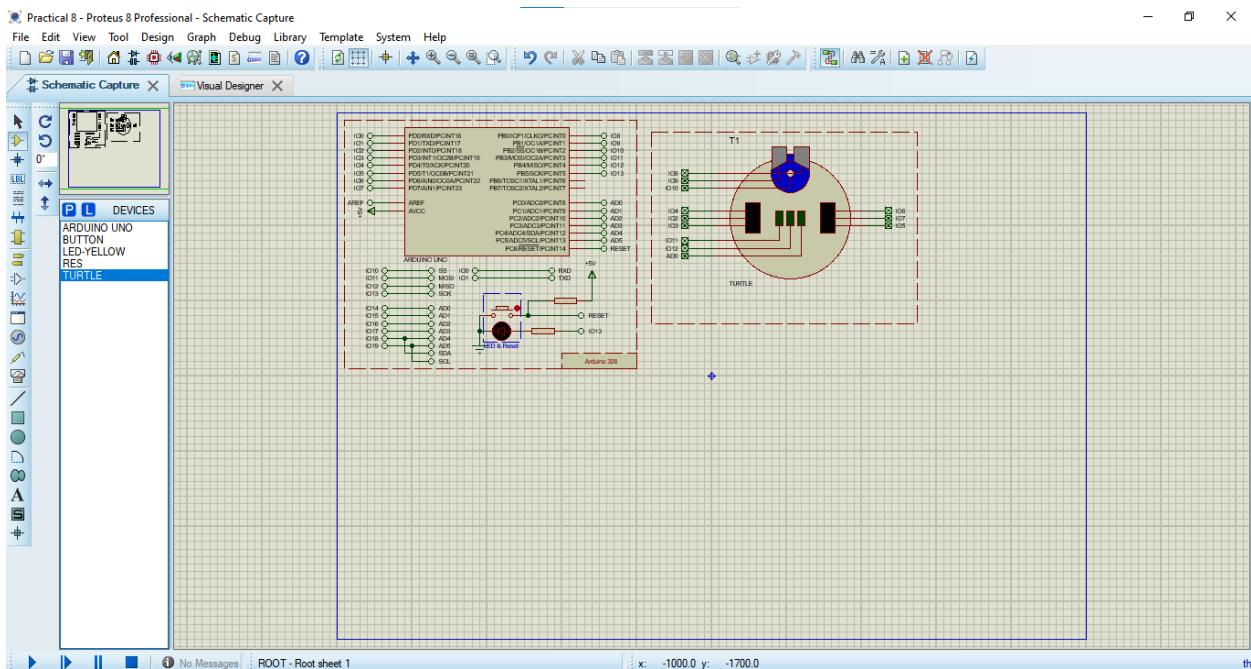
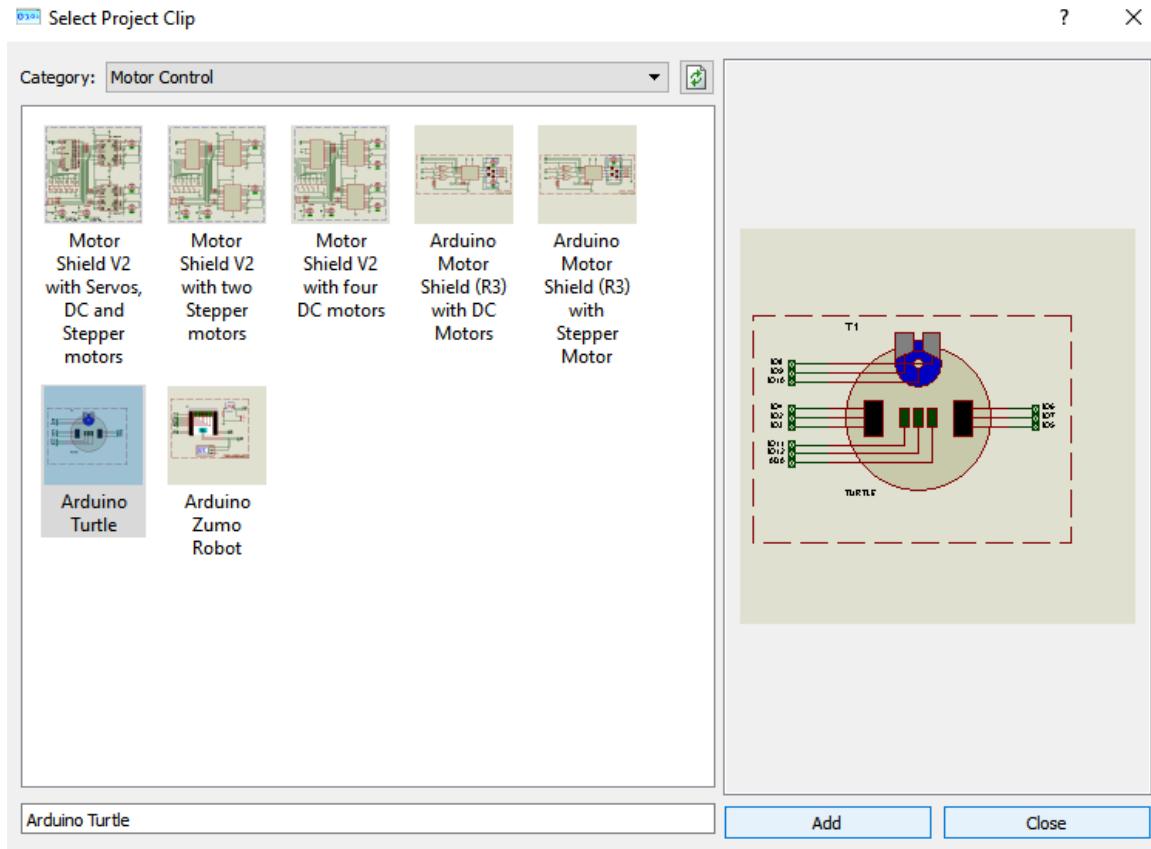
Right click on Project Name -> Click on Add Peripherals



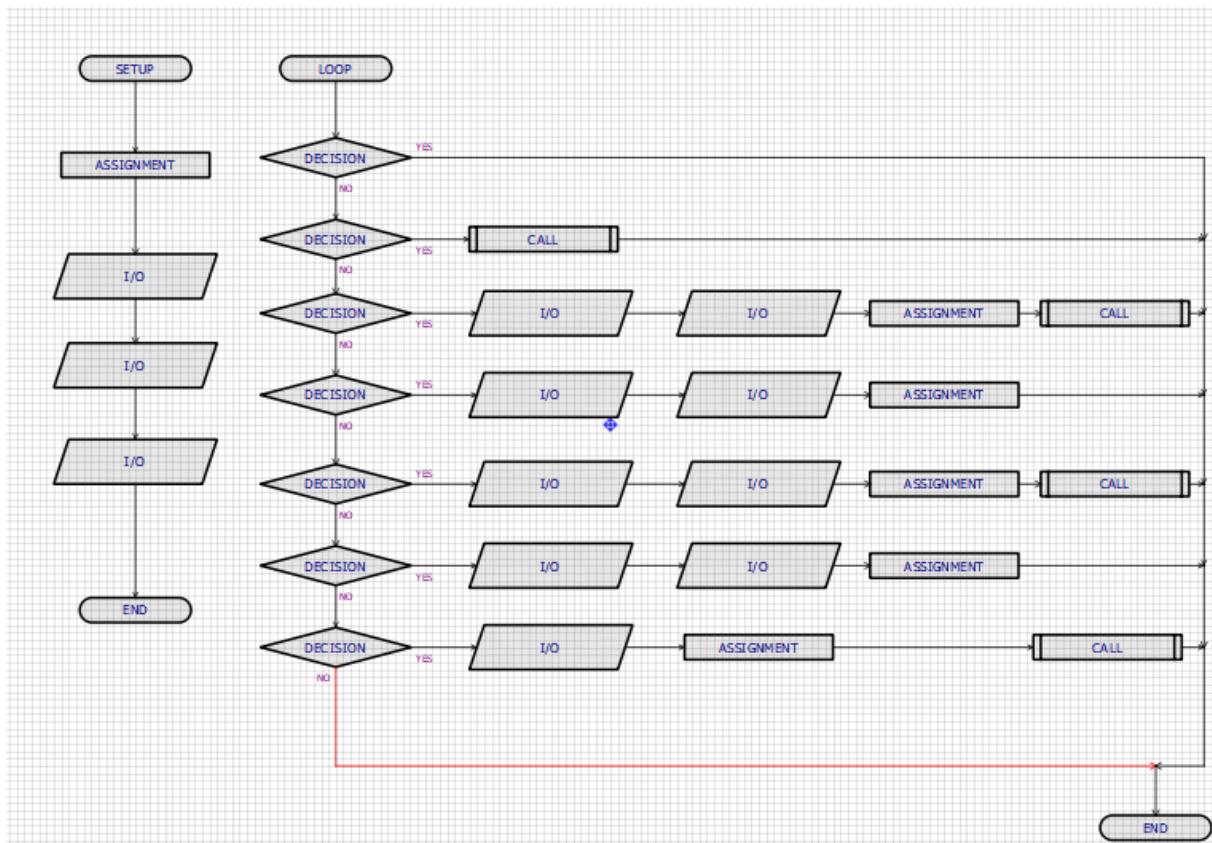
From Dropdown -> Select Motor Control



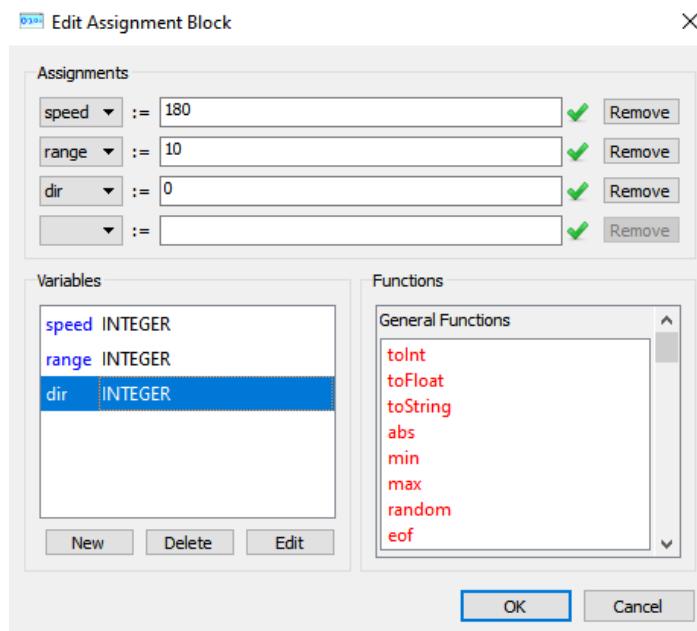
And then Select Arduino Turtle and Click on Add



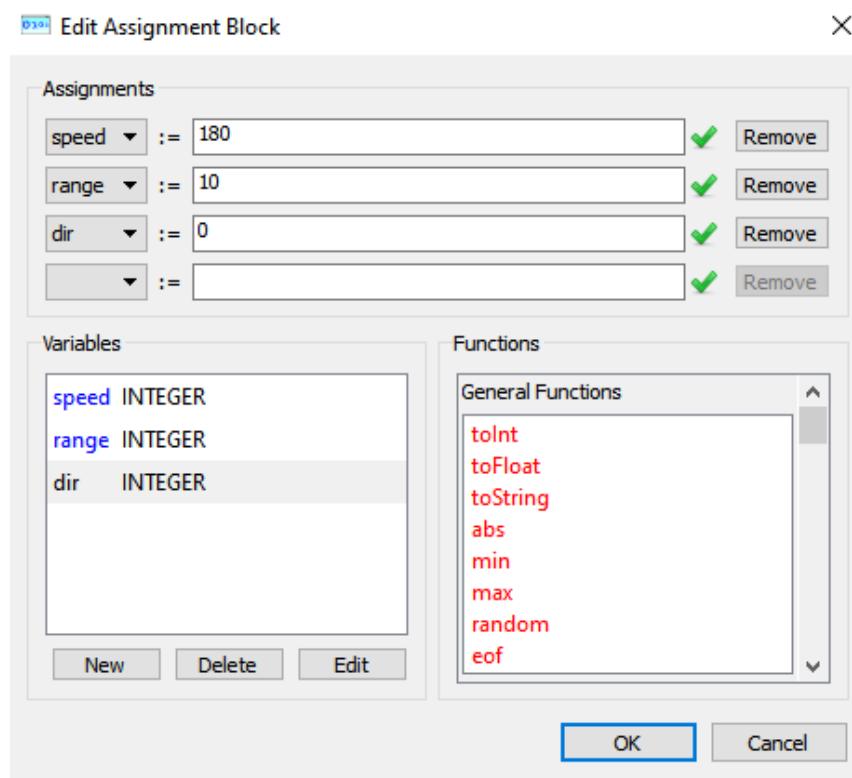
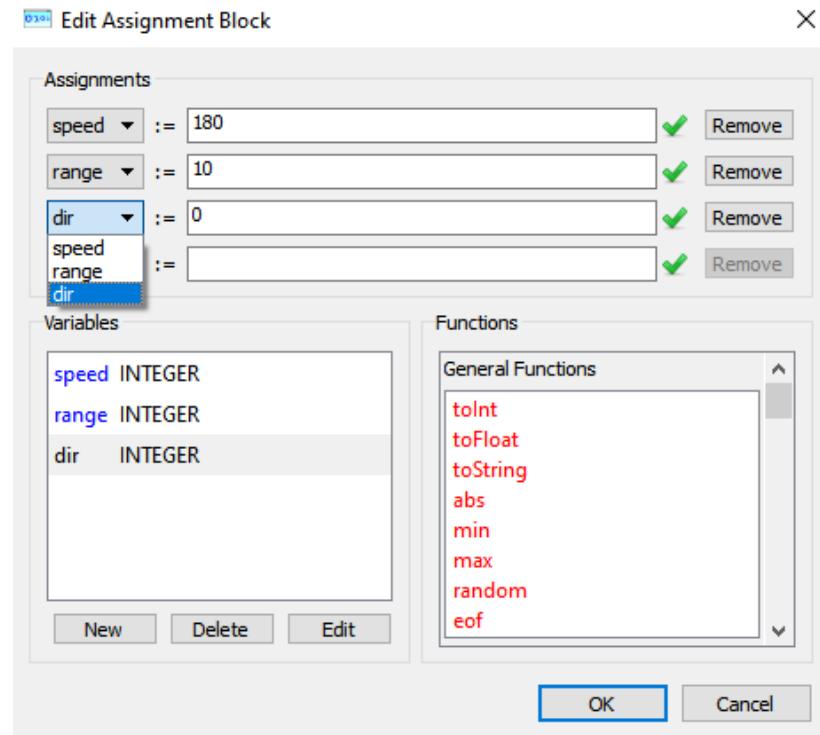
Step 3: Click on Visual Design and create Flow Chart



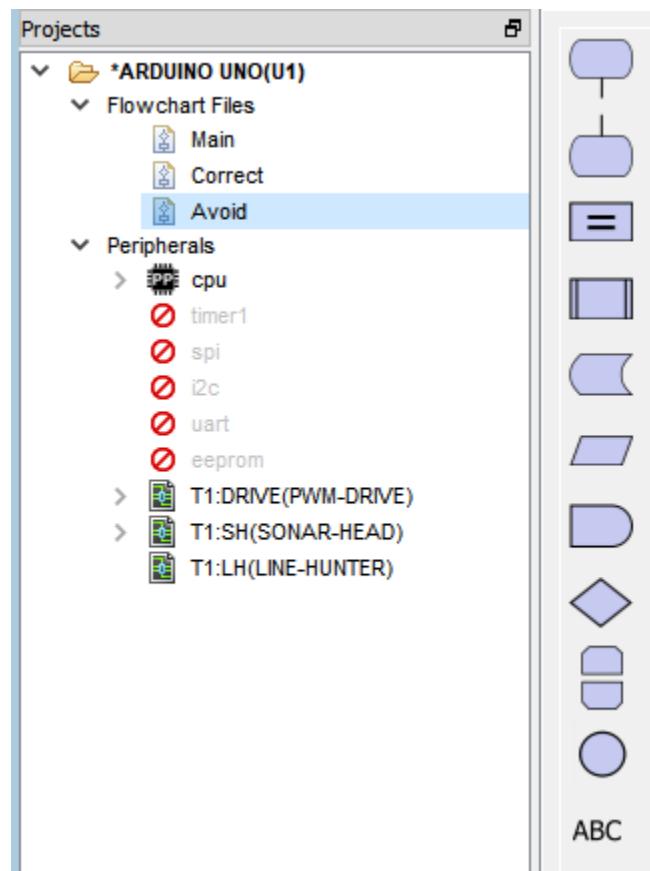
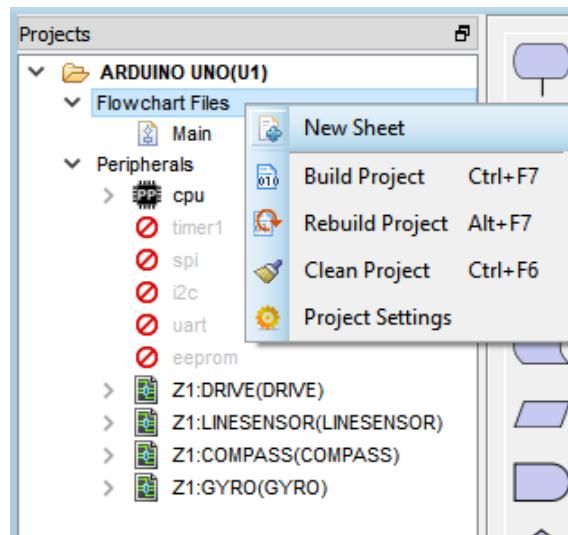
Step 4: Add variables



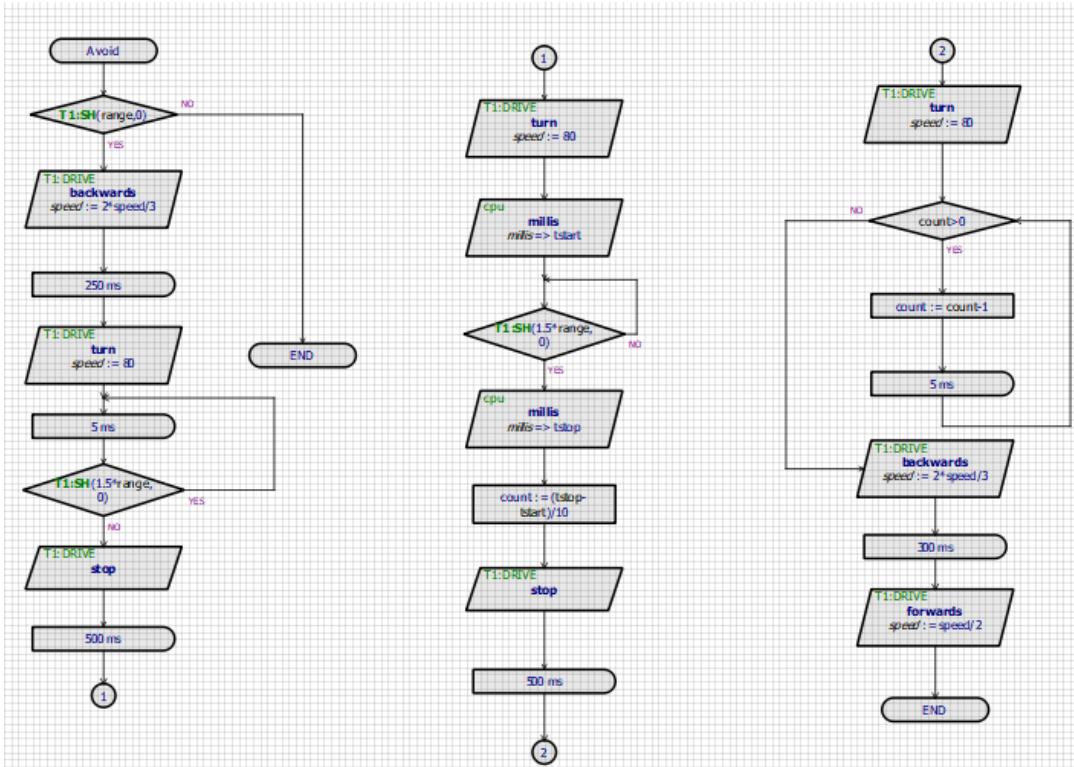
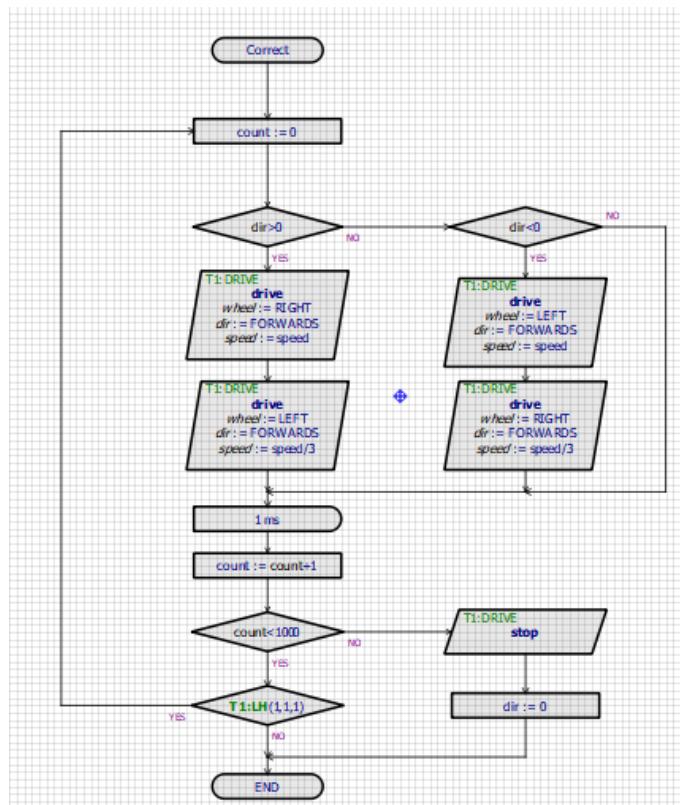
Step 5: Now set Assignments



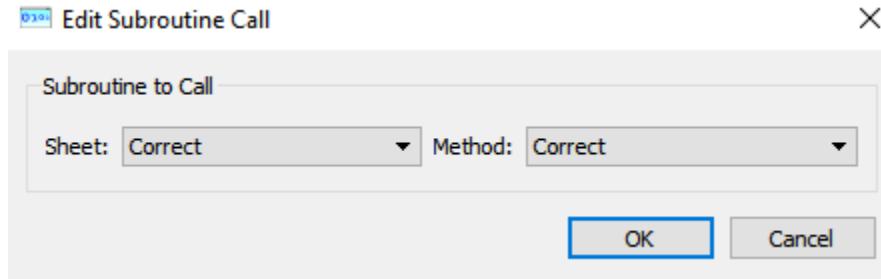
Step 6: Right click on Flowchart Files -> Click on New Sheet



Create flow chart for Correct and Avoid

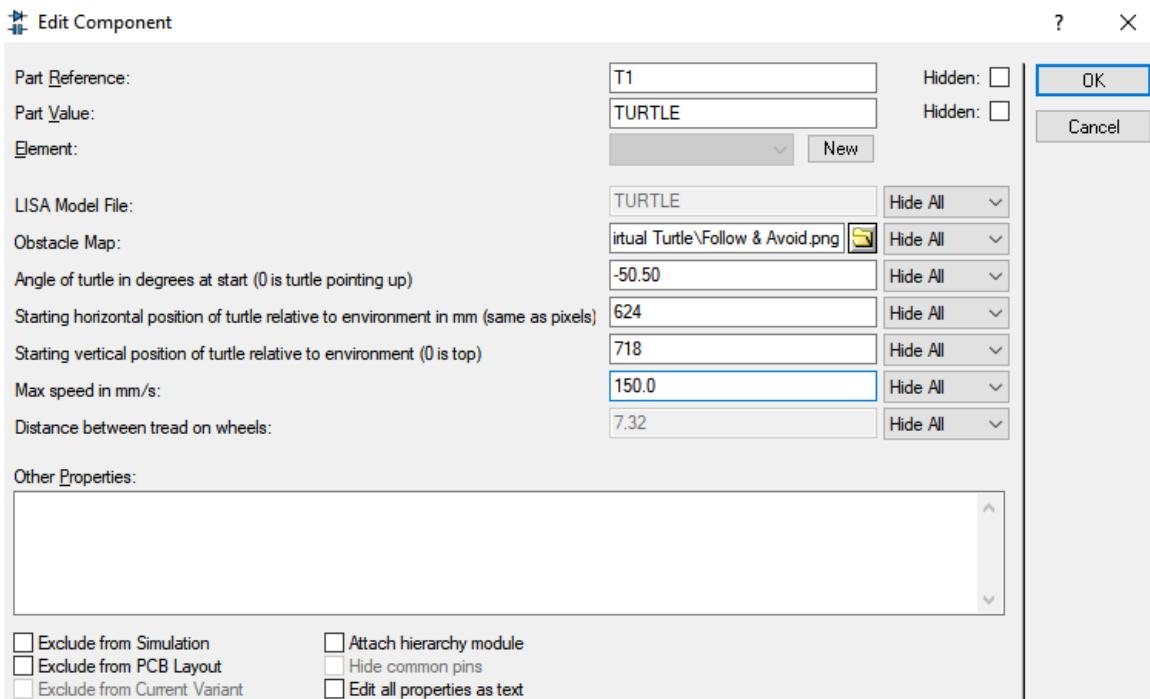


Step 7: In Main chart add Correct and Avoid chart

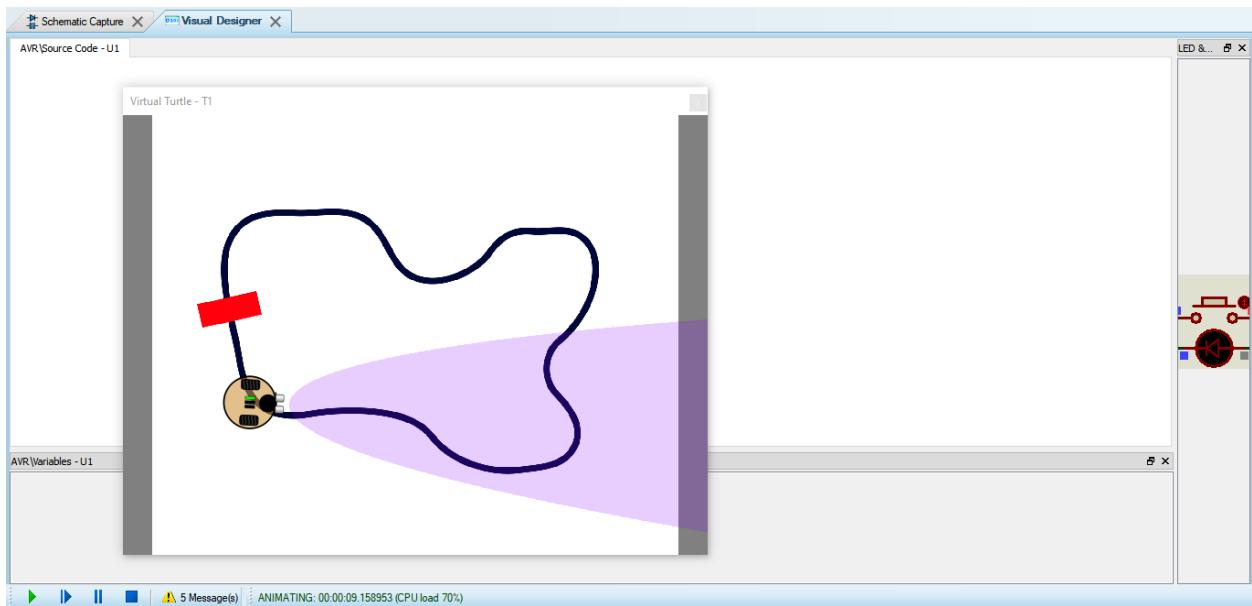


Step 8: Double click on Turtle

- Add Obstacle Map
- Set Angle of turtle in degree to -50.50
- Set Starting horizontal position to 624
- Set Starting vertical position to 718
- and then click on Ok



Step 8: Click on Run Simulation Button



Practical No. 9

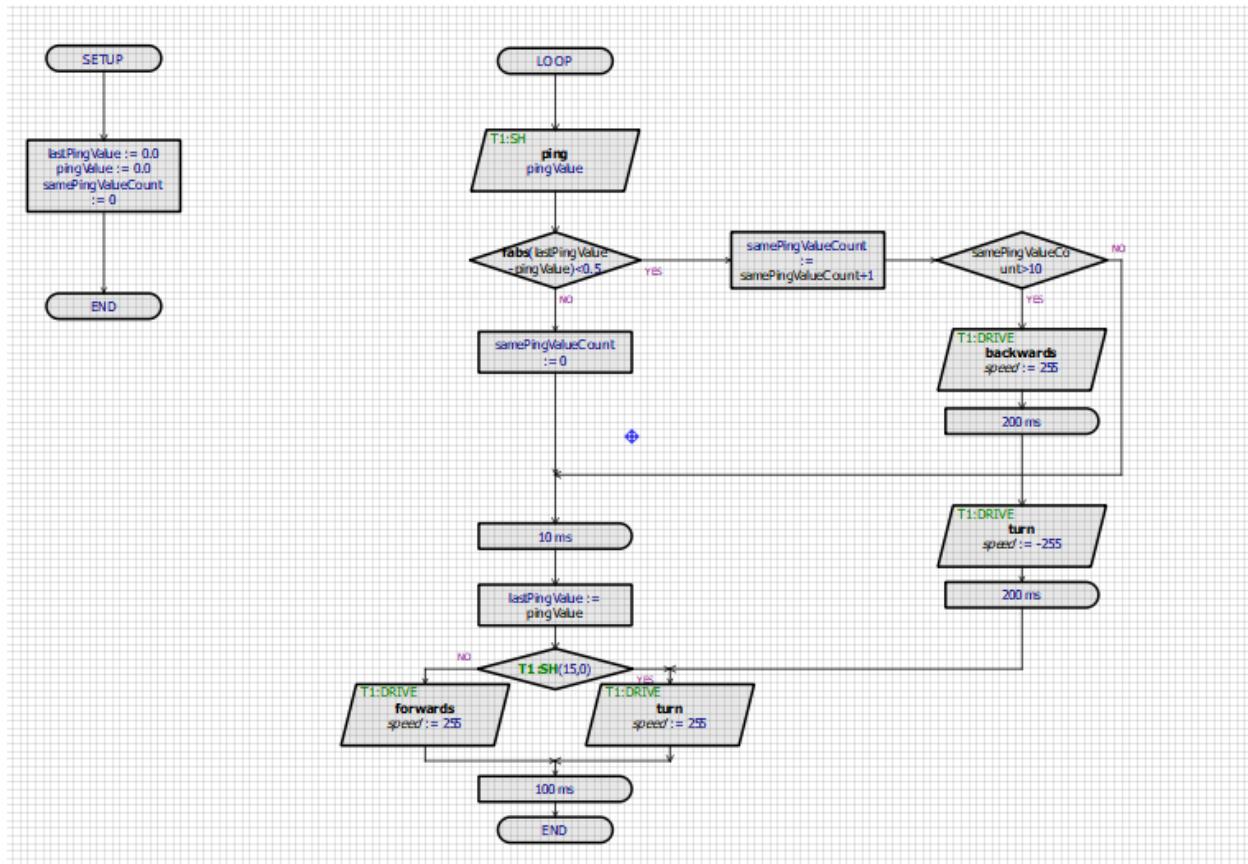
Aim: Avoid Obstacles

Component Used:

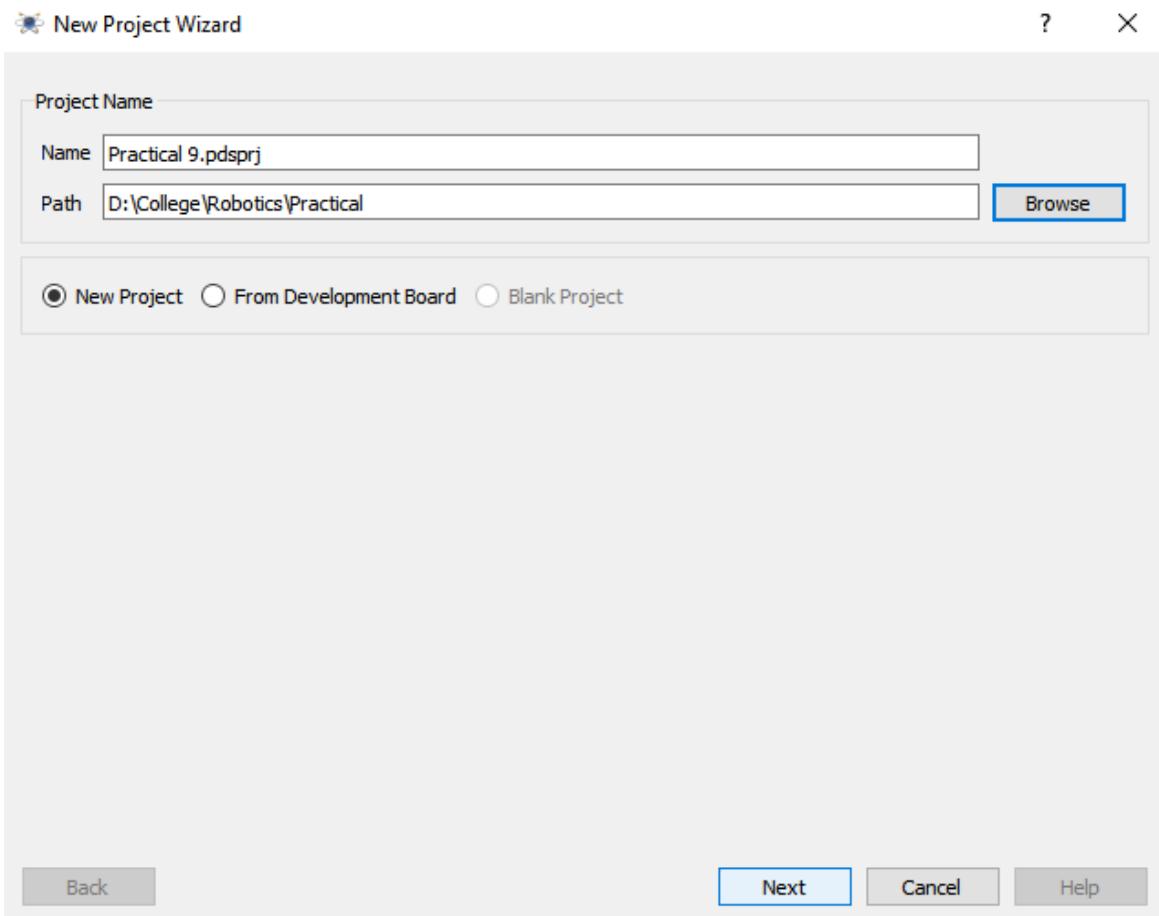
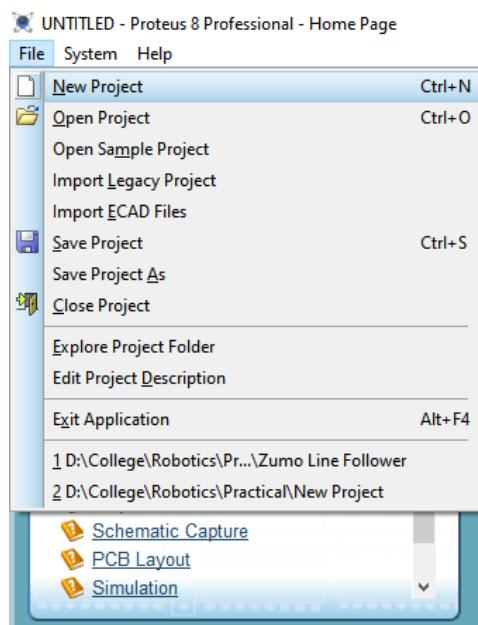
1. Arduino UNO
2. Arduino Turtle

Flow Chart:

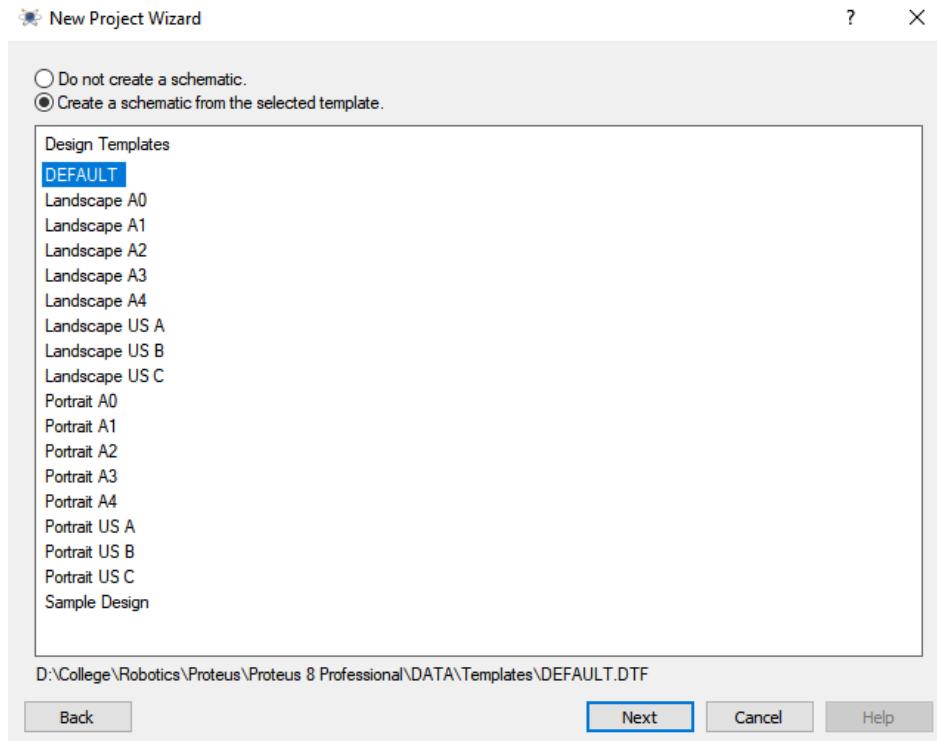
Main



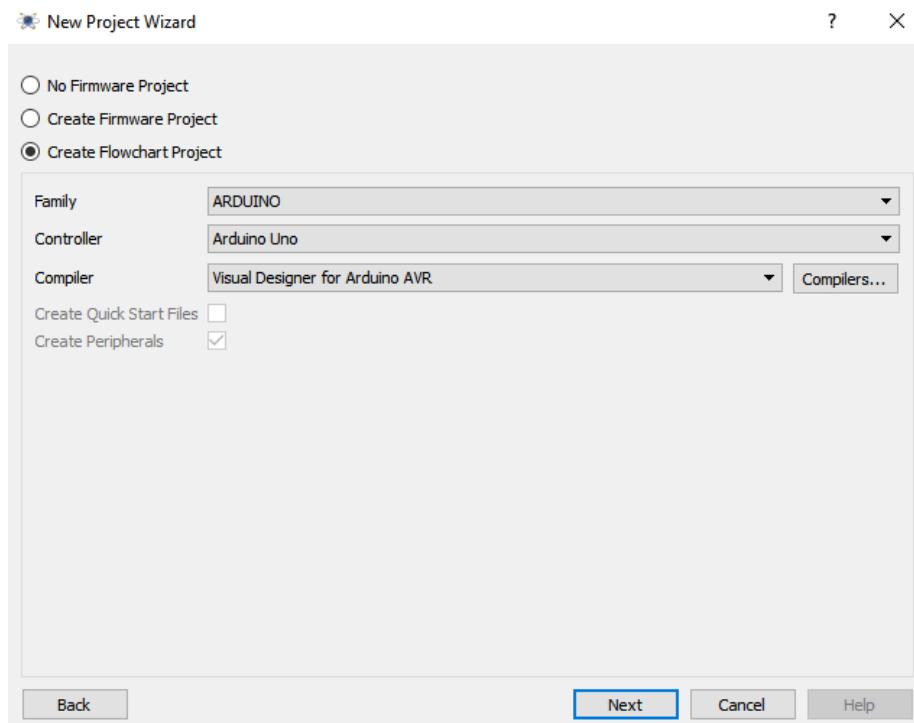
Step 1: Open Proteus > Click on File > Click on New Project



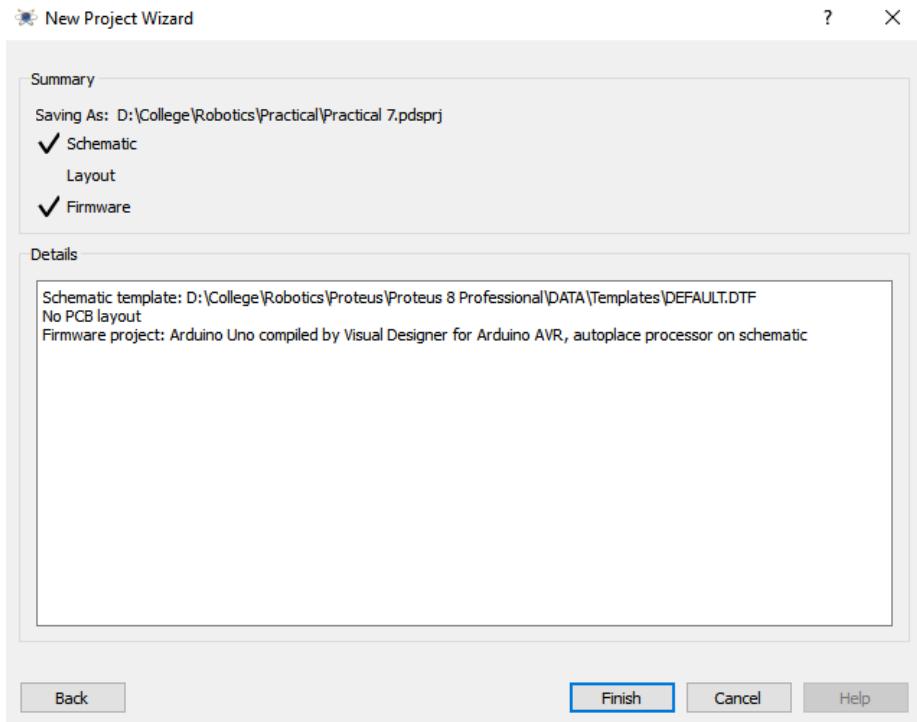
Set it to Default and Click on Next



Now Select Create Flowchart Project option

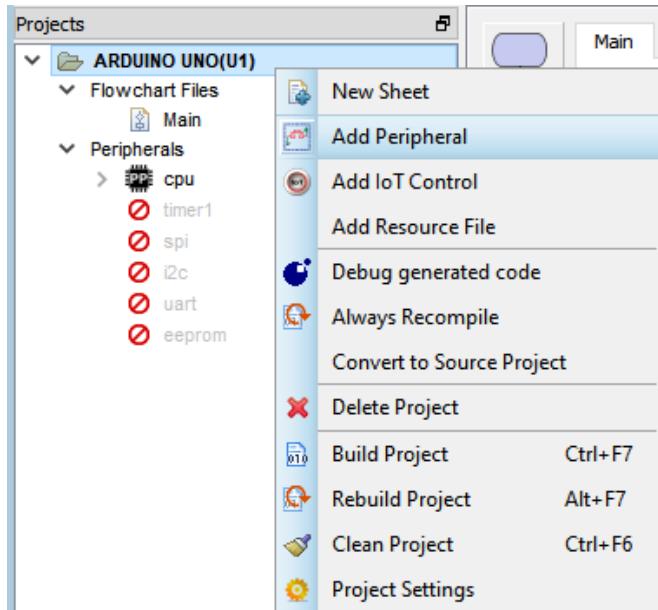


Then Click on Finish

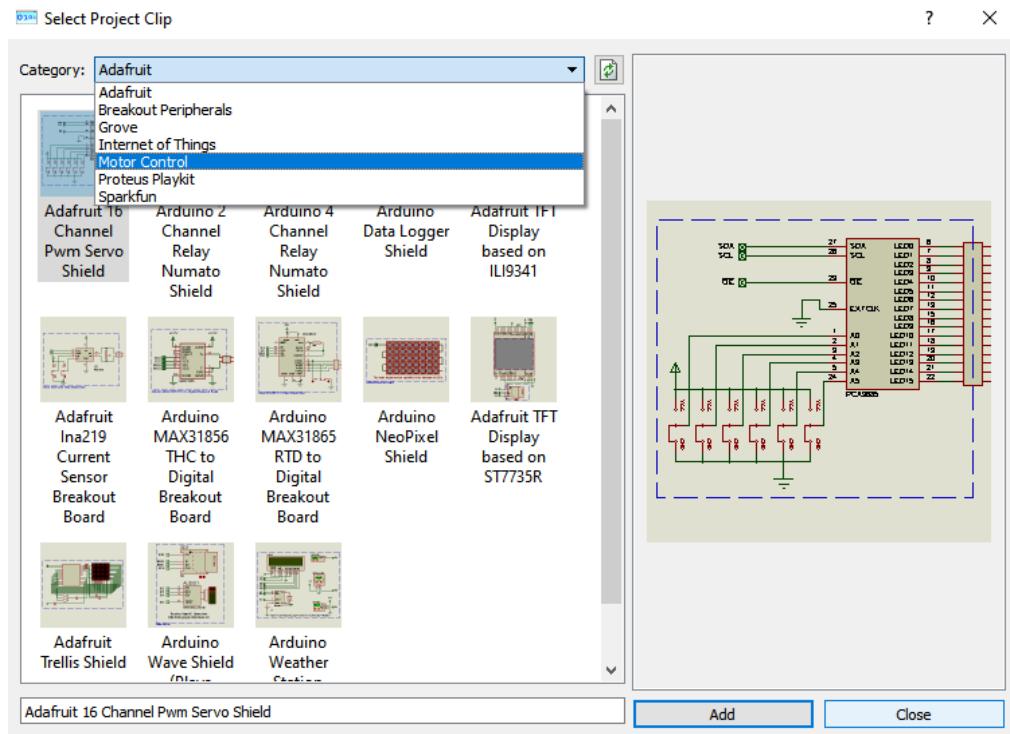


Step 2: Add Arduino Turtle

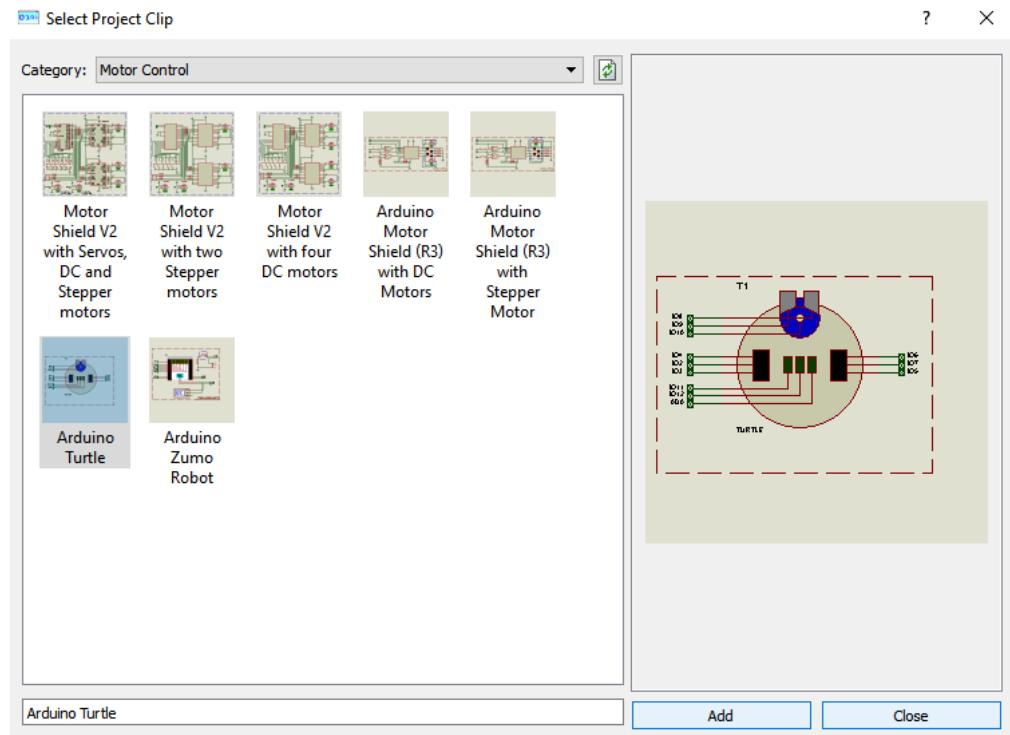
Right click on Project Name -> Click on Add Peripherals

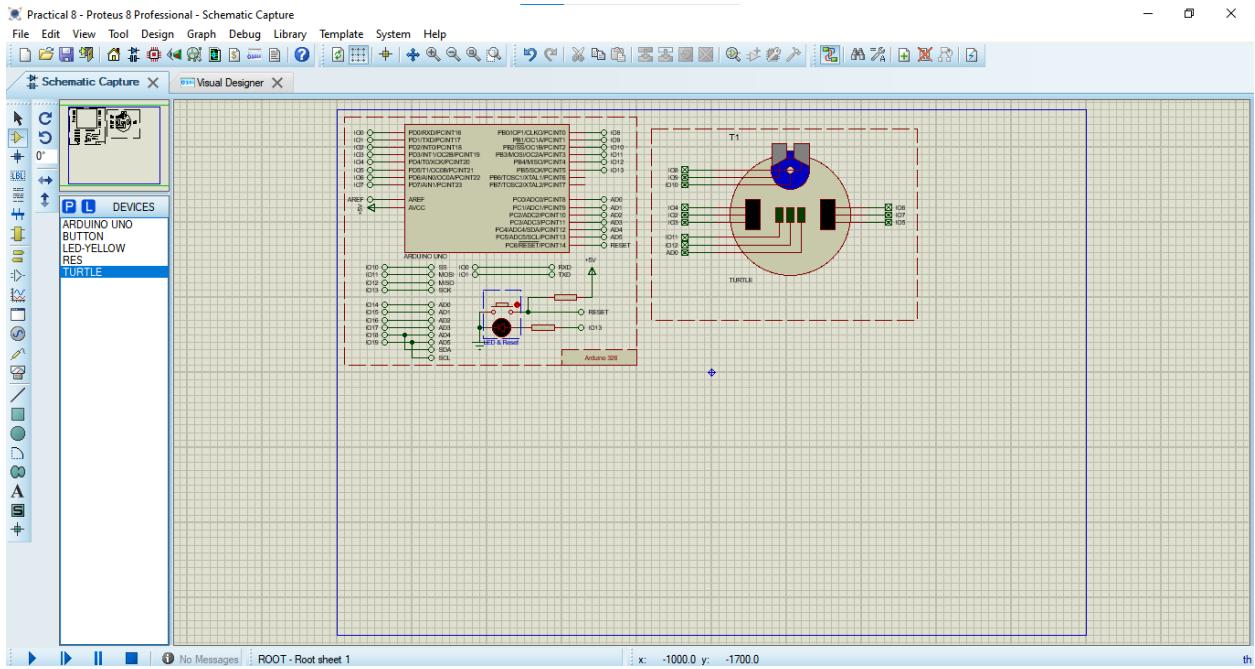


From Dropdown -> Select Motor Control

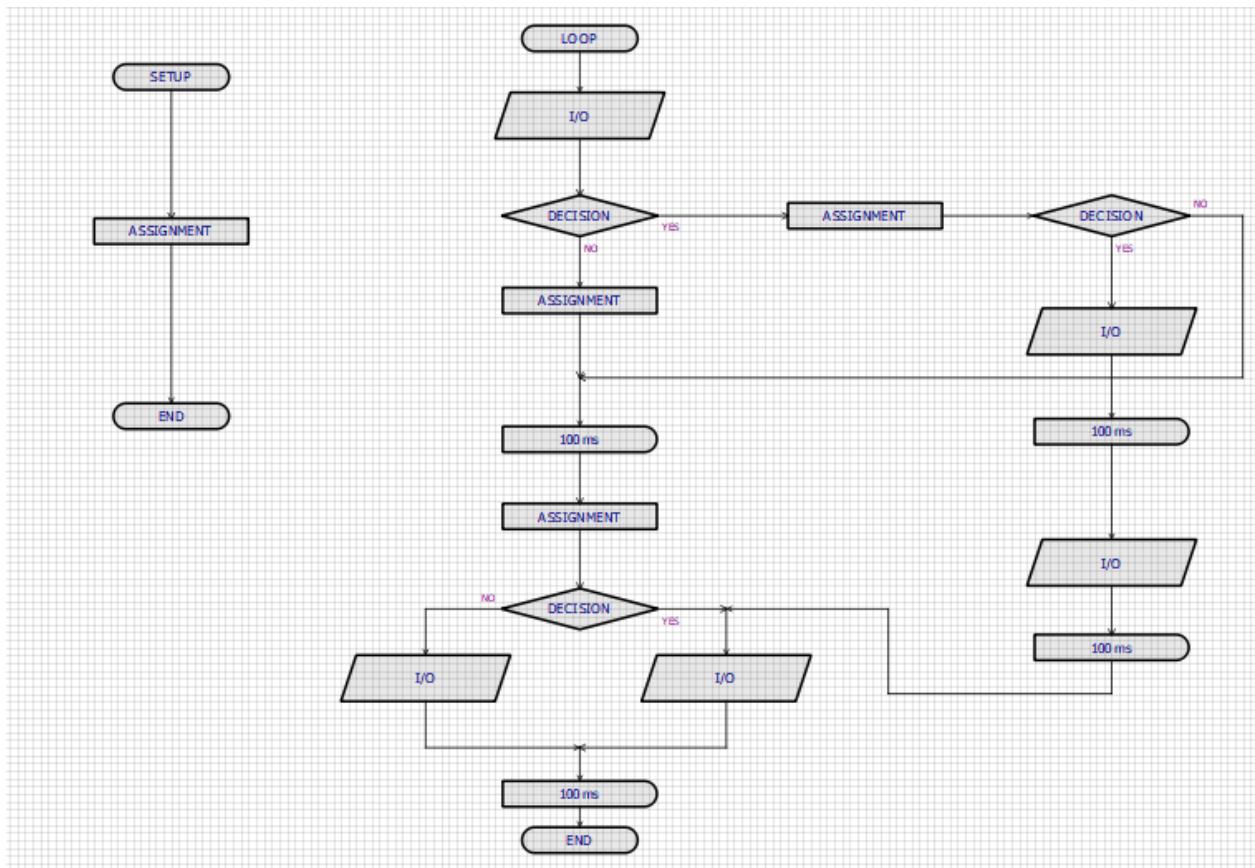


And then Select Arduino Turtle and Click on Add

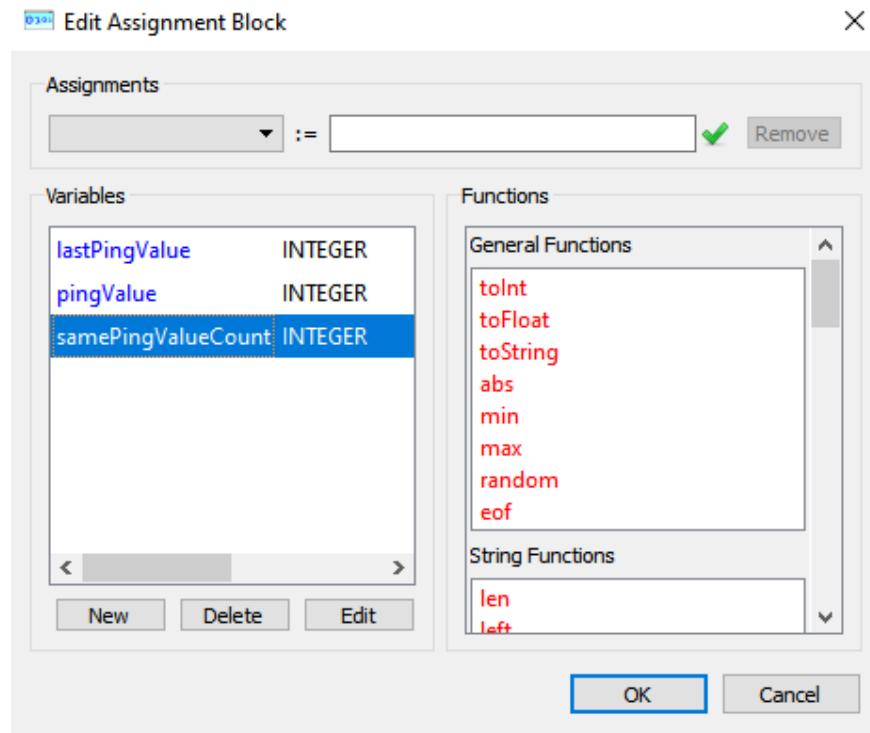




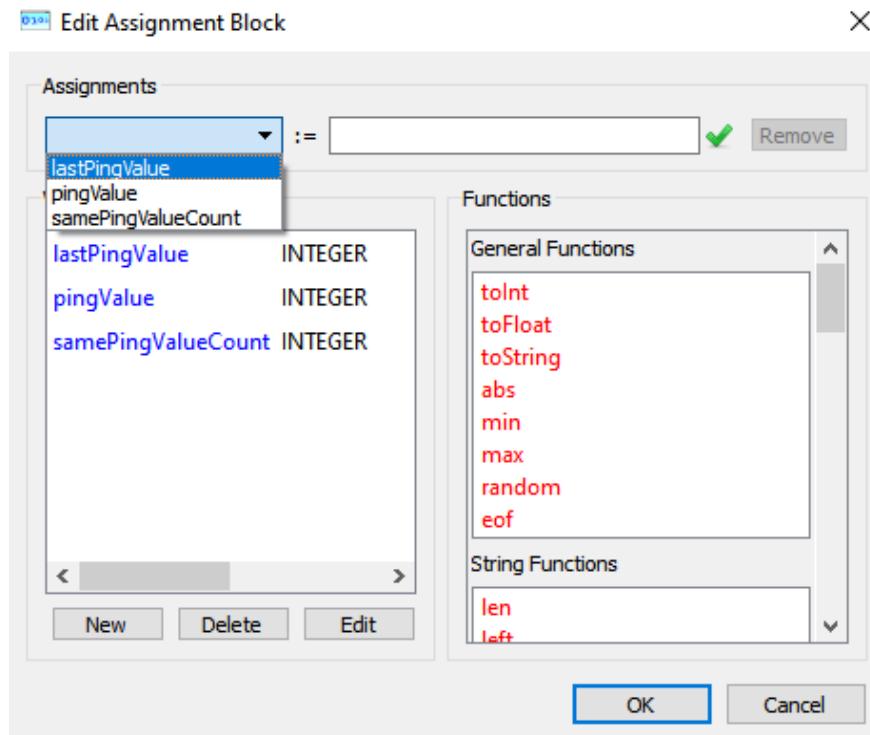
Step 3: Click on Visual Design and create Flow Chart

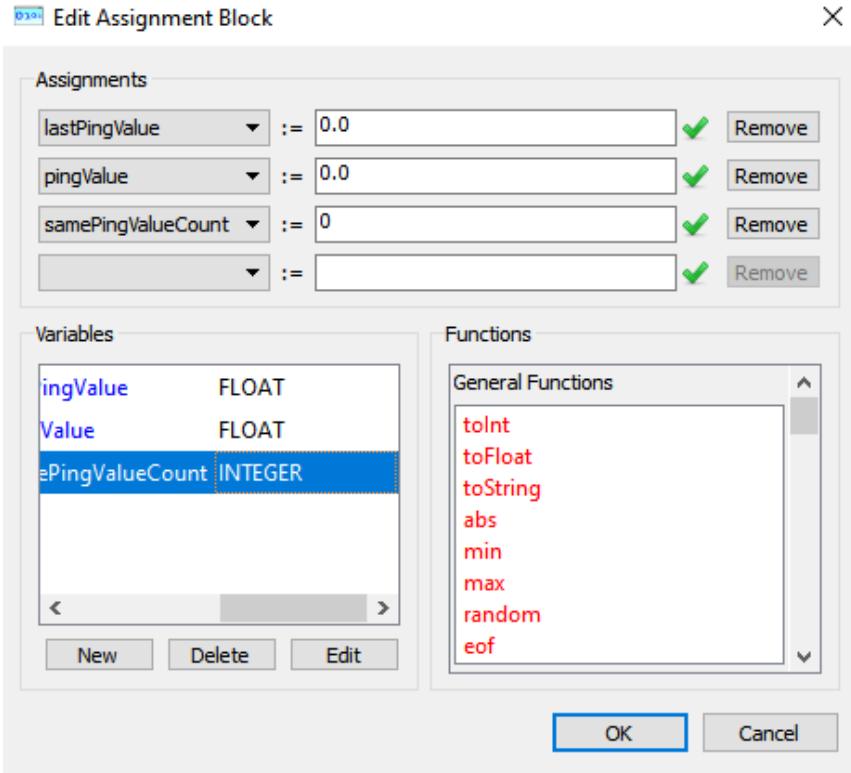


Step 4: Add variables

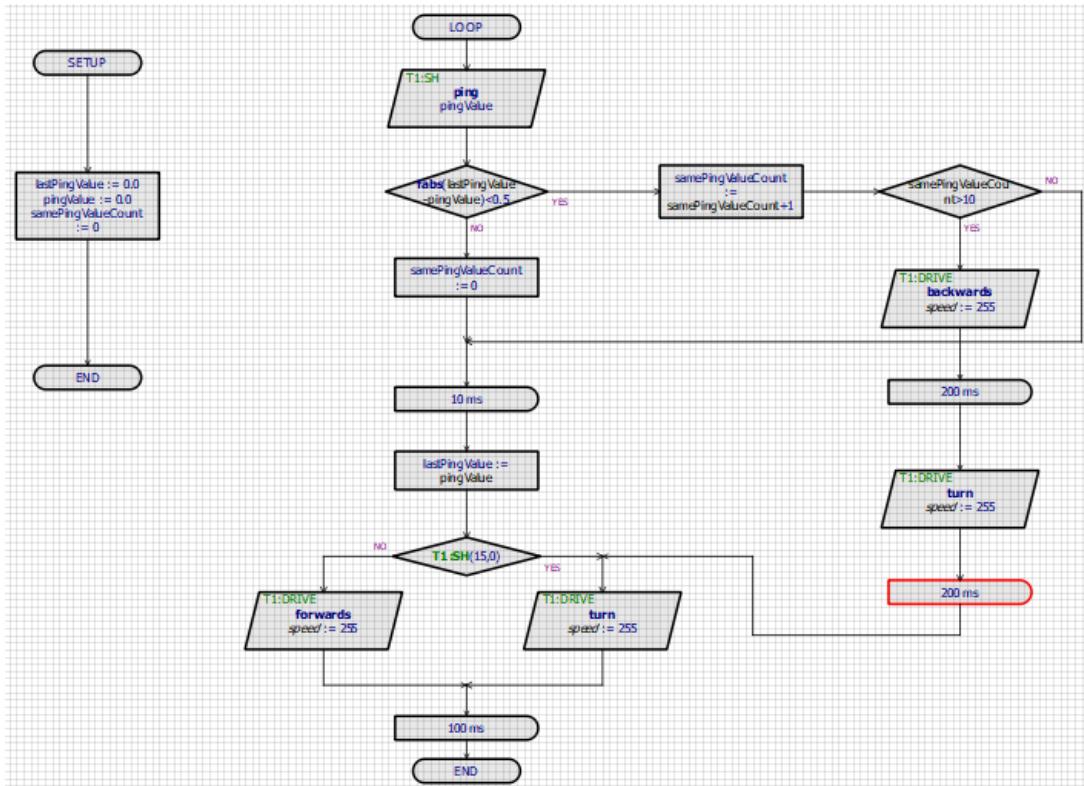


Step 5: Now set Assignments



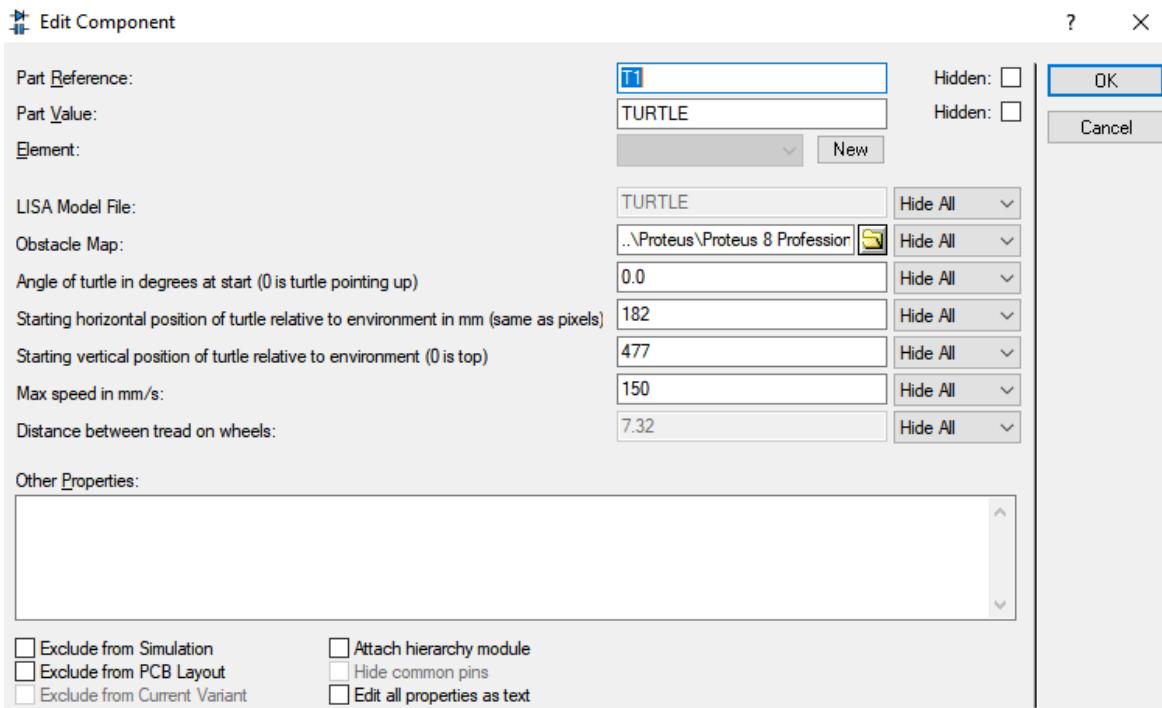


Flowchart



Step 8: Double click on Turtle

- Add Obstacle Map
- Set Angle of turtle in degree at start is 0.0
- Set Starting horizontal position of turtle relative to environment is 182
- Set Starting vertical position of turtle relative to environment is 477
- Set Max Speed to 150
- and then click on Ok



Step 9: Click on Run Simulation Button

