MALINENI LAKSHMAIAH WOMEN"S ENGINEERING COLLEGE
(AUTONOMOUS)
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Pulladigunta(V), Vatticherukuru(M), Guntur(Dt), A.P.

ROBOTICS BOOT CAMP

ELECTRONIC COMMUNICATION AND ENGINEERING(ECE)

THE ROCK STARS

Team Leader: **N. Naga Madhuri (23KE1A0478)**

Team Members:

V. Sravani (23KE1A04C5)

V. Jahnavi (23KE1A04C7)

N. Yusha Sri (23KE1A0479)

E. Hima Bindu (24KE5A0406)

CH. Alekhya Gayatri(24KE5A0404)

From:- ECE

IOT ROBOT

INTRODUCTION OF IOT ROBOT:-

An IOT robot is a wire less communication. An IOT (Internet of Things) robot is a robot that is connected to the cloud through internet and it can collect, send, and receive data by accessing cloud through internet. It can interact with its environment and other devices, and can be controlled or monitored remotely through the internet.

REQUIREMENTS OF IOT ROBOT:-

- CHASSIS
- WHEELS
- MOTOR DRIVER(L298)
- MOTOR (ACUTATORS)
- JUMPER WIRES
- BATTERY
- ESP32 CHIP
- INTERNET

IOT robot accessing cloud through internet

METALLIC CHASSIS:-

- A robot chassis, also known as it's frame, is a structural component of the robot that's provides a foundation for the robot and other components allows it's to move the robot.

MOTORS:-

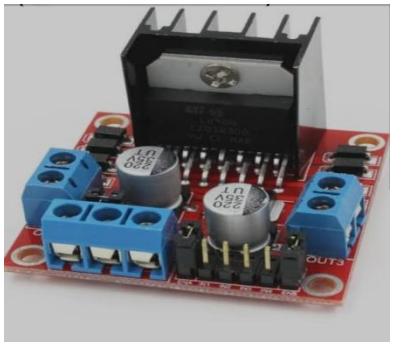
A motor is an electrical device that converts electrical energy into mechanical energy, producing motion or torque.

MOTOR DRIVER(L298N):-

A motor driver(L298N) is an electronic device,which can amplify‘s the current’s upto 2A. Motor drivers act as an interface between a micro controller and the motor.

Key functions of a motor driver:

- ✧ Direction control: Switches motor rotation between clockwise and counterclockwise.
- ✧ Speed control: Regulates motor speed, often using Pulse Width Modulation (PWM).
- ✧ Current limiting: Prevents excessive current draw, protecting the motor and driver.
- ✧ Overheat protection: Shuts down the driver if it overheats.



WHEELS:-

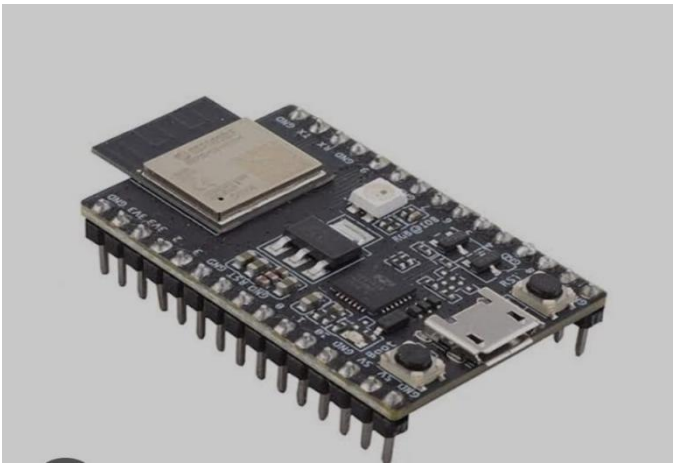
Wheels play a crucial role in robots, enabling mobility, navigate around the ground, and interaction with the environment.

ESP32 CHIP:-

The ESP32 chip can be used as the control unit in robotics project to provide wireless control and communication capabilities to robot. ESP32 is a micro controller with integrated Wi-Fi and Bluetooth capabilities. It's widely used in robotics for its versatility, ease of use, and connectivity features.

Here are some examples of how the ESP32 can be used for wireless robot:

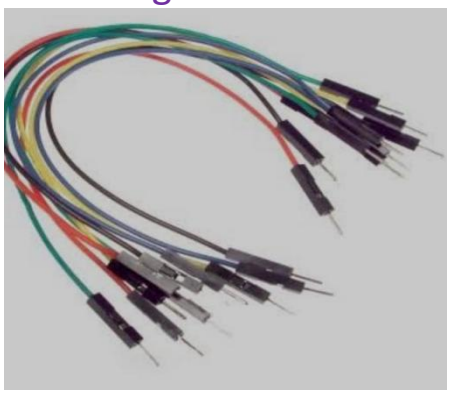
- ✧ Bluetooth game pad controller
- ✧ Wi-Fi remote controller
- ✧ PS3 controller



JUMPER WIRES:-

Jumper wires are used for these connections:

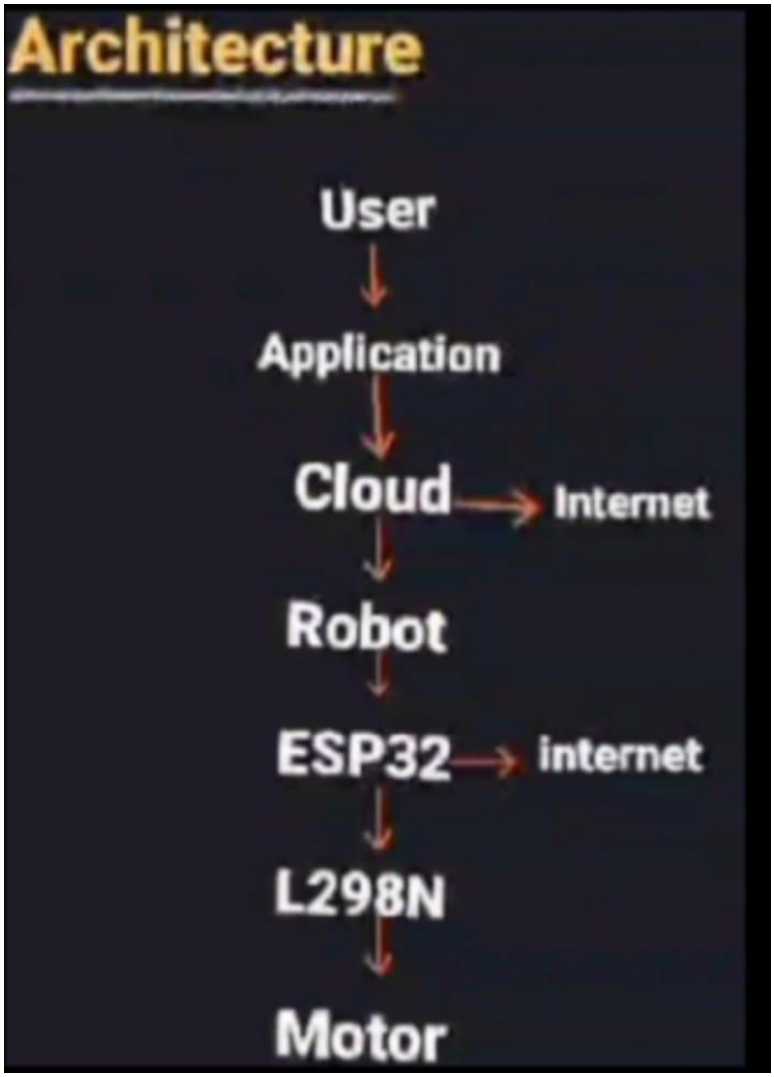
- ✧ Connect sensors and actuators to micro controllers.
- ✧ Link modules and components in robotic systems.
- ✧ Prototype and test robotic circuits.
- ✧ Debug and troubleshoot robotic systems.



BATTERY(POWER SOURCE):-

Power sources in robots provide the necessary energy for operation. Common power sources includes like Batteries,Solar panels,. Pneumatic or hydraulic systems.
In the IOT robot we are using power source like battery of 12v-1A-speed-300RPS

ARCHITECHTURE OF IOT ROBOT:-



Cloud computing is a model of delivering computing services over the internet, where resources such as servers, storage, databases, software, and applications are provided as a service to users on-demand.cloud is important for IOT robot

PROCEDURE:-

- ✓ Design the chassis of your robot whether it will plastic or metallic chassis.

- ✓ First check positive and negative terminals of the motors, by connecting the motors to the battery positive to positive and negative to negative to the battery then motor moves clock wise direction and also fix the motors left and right to the chassis.

- ✓ Motor is a polarized component then we have connect the left motors and right motors in parallel connection between positive and negative terminals.

- ✓ In Parallel connection the voltage passes equally to the motors of left and right then the all motors moves equally.
- ✓ Where the equation is

V DIRECTLY PROPORTIONAL TO S

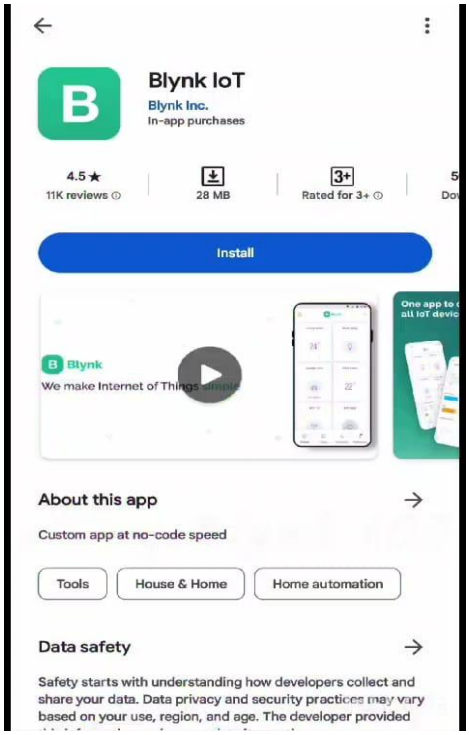
- ✓ Connect the four wheels to the four motors
- ✓ After that we have connect the connections between motors,L298N(motor driver),ESP32 chip then the connections are

- Then connect the motor left(ML) positive to L298N(out1 pin) and negative terminals to L298N(out2 pin).
- After that connect motor right(MR)positive to L298N (out3 pin) and negative terminals to L298N (out4 pin).
- In L298N (Vcc pin) is for positive terminal of a battery
- In L298N two wires across the (GND pin) one wire is for nagative terminal of battery and another wire of female end of jumpper wire is connected to the ESP32 (GND pin).
- L298N (+5V pin) is connected to ESP32 (Vin pin).
- L298N (IN1 pin) is connected to the ESP32 (D14 pin).
- L298N (IN2 pin) is connected to the ESP32(D27 pin).
- L298N (IN3 pin) is connected to the ESP32 (D26 pin).
- L298N (IN4 pin) is connected to the ESP32 (D25 pin).

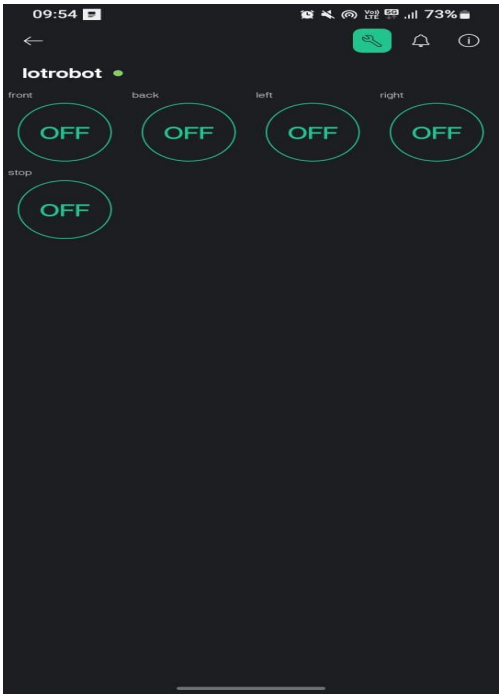
- L298N (ena pin) is connected to the ESP32 (D33 pin).
- L298N (enb pin)is connected to the ESP32 (D32 pin).

- Process of register in BLYNK cloud:-

- Search BLYNK.cloud
- After that register in dashboard.
- After the register the BLYNK.console web will displays.
- After that click create new template.
  Name - IOT robot
  Hardware - ESP32
  Connection type - WiFi
  Description - robot
- After filling the details click done
- Then the template is created like # define
  BLYNK_TEMPLATE_ID
- After that click set up data stream
- Next click new data stream
- Select virtual pin
- Appear window and fill the details like these
  Name:-front
  Pin:-Vo
  Unit:-none
  Alias:-front
  Data type:-int
  Click option create.
- Like these create for all operations like back,left,right,stop
  after filling these data streams click save option.
- Then install blynk app in mobile.



- Log in BLYNK in mobile also
- From BLYNK app we will operate the IOT robot.



- We have to write a program for IOT robot in arduino software in the laptop

- Process of installing the BLYNK library:-

Before writing the program we have install BLYNK library. First go sketch option,and select the option include library, on that select the manage libraries, after 2 min library manager will be shown on desktop,in that we have to select types-all,topics-all,next search-BLINK and select version of library and installed the version of BLYNK library.

✧ PROGRAM

```
 #define BLYNK_TEMPLATE_ID "TMPL3hTmIs-BC"
#define BLYNK_TEMPLATE_NAME "iotrobot"
#define BLYNK_AUTH_TOKEN
"90ut2c71fSN0_FAPgJxTPj_o3uVDete8"

#define BLYNK_PRINT Serial
#include<WiFi.h>
#include<BlynkSimpleEsp32.h>

char auth[]=BLYNK_AUTH_TOKEN;
char ssid[]="Buddi.....";
char password[]="Doraemon";

BLYNK_WRITE(V0){
  int state=param.asInt();
  if(state==1){
    roboFront();
  } else{
   roboStop();
  }
}
BLYNK_WRITE(V1){
  int state=param.asInt();
  if(state==1){
    roboBack();
  } else{
```

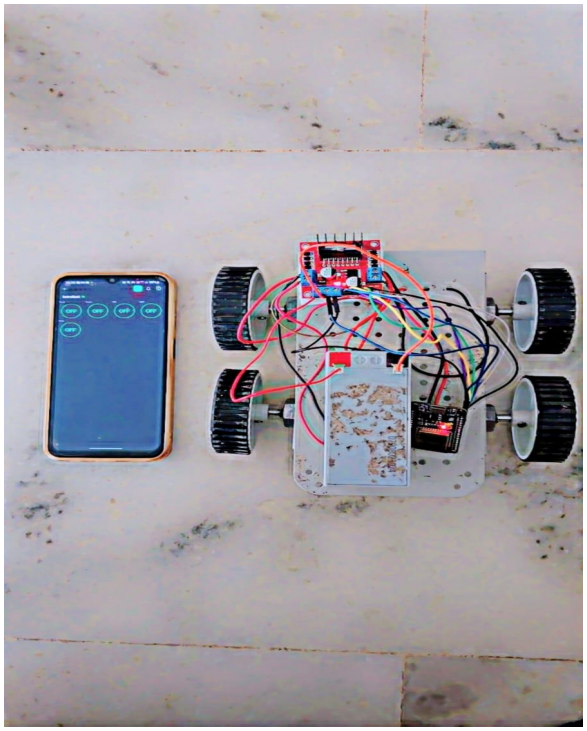
```
    roboStop();
  }
}
BLYNK_WRITE(V2){
  int state=param.asInt();
  if(state==1){
    roboLeft();
  } else{
    roboStop();
  }
}
BLYNK_WRITE(V3){
  int state=param.asInt();
  if(state==1){
   roboRight();
  }else{
    roboStop();
  }
}
int in1=14;
int in2=27;
int in3=26;
int in4=25;
int ena=33;
int enb=32;

void setup() {
 // put your setup code here, to run once:
  pinMode(in1,OUTPUT);
  pinMode(in2,OUTPUT);
  pinMode(in3,OUTPUT);
  pinMode(in4,OUTPUT);
  pinMode(ena,OUTPUT);
  pinMode(enb,OUTPUT);
  Serial.begin(9600);
```

```
  Blynk.begin(auth,ssid,password);
}

void loop() {
  // put your main code here, to run repeatedly:
  Blynk.run();
}void roboFront(){
  digitalWrite(in1,1);
  digitalWrite(in2,0);
  analogWrite(ena,255);
  digitalWrite(in3,1);
  digitalWrite(in4,0);
  analogWrite(enb,255);
}

void roboBack(){
  digitalWrite(in1,0);
  digitalWrite(in2,1);
  analogWrite(ena,255);
  digitalWrite(in3,0);
  digitalWrite(in4,1);
  analogWrite(enb,255);
}

void roboLeft(){
  digitalWrite(in1,0);
  digitalWrite(in2,0);
  digitalWrite(in3,1);
  digitalWrite(in4,0);
  analogWrite(enb,255);
}

void roboRight(){
  digitalWrite(in1,1);
  digitalWrite(in2,0);
```

```
  analogWrite(ena,255);
  digitalWrite(in3,0);
  digitalWrite(in4,0);
}

void roboStop(){
  digitalWrite(in1,0);
  digitalWrite(in2,0);
  digitalWrite(in3,0);
  digitalWrite(in4,0);
}
```

- ✓ After writing the program we have to compile the program .
- ✓ Then upload the program in ESP32 chip after the uploading then the IOT robot is connected to battery.
- ✓ Then the IOT robot is ready to ride which is operated by the BLYNK app.

RESULT:-

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