EXPERIMENT NUMBER: 3
DATE: 28/03/2022, Menday

Webserver and JoT Cloud Communication
Using Ardelino ...

+ AIM :

Analyze varians communication protocals used in the design of partable devices.

\* LOOF (Anduing IDF):

(a) Identification of Available Wife Networks -

This code demenstrates how to scan Wifi networks. The API is almost the same as with the wiff shield library, the most obvious difference being the different file you need to include.

# include "ESP 8266 Wiff". A" Il ESP8266 Wiff". A library

If the setup function nums once when you prepare for reset or power the board:

void setup ()

Serval begin (9600); Il Initialize serval communication (VART) with band rate of 9600 bps

If set wifi to station made and disconnect from an access
point, if it was previously connected;
wifi made (WIFI\_STA);
wifi disconnect ();
delay (100);

# (a) Identification of mailable With Networks.

Components used:
Otsp 8266 Witi module
O Paner Supply Cable / Battery

## Hardware Labelled Diagram

` .		` `		V	A STATE OF THE STA
ADC K				6 - 4 - 15	LLD
	AD		, , , , , ,		DO
	RSV		23	1700	DI
	RSV		90		<b>D</b> 2
	503		ESPA266M2D		D3
	502		130	50	D4
	SDI	vi. N			3.37
, ,	CMD			S 1 3 1	SND
-	800 CLK	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	all y	1 1 3	34305
	GND	- 4	1.42	Jan X	D6
	3.34				<b>D</b> 1
	FN	RST		Flash	pe Ry
	RST				
	and			7	TX
	Vin				GND
,		30 V (1)		Signal away	3.3Y

```
serial printle ("setup Dane.");
If The loop function hums over and over again forever:
vaid loop 1)
  serial. println ("kan start");
   Il Wifi scan Networks will netwer the numer of networks
       found:
   int n = Wiff. scan Networks ();
   Serial printen ("Scan Completed."):
    if (n==0)
      Serial printle (" No netoson's found.");
       Serval. print (n);
       Serial. println ! " Networks found. ");
       11 Print the SSID (Service Set Identifier) and RISI
           (Received Ligral strength Indicator) for each networks:
       for Cint i=0 , Kn ; +ti)
          Serial print (iti);
          Serial print (: ");
           Secual print (with SSID (i));
           Serial print (" (");
            social print (With RESTLI);
            Serial print (") ");
```

### (a) Identification of Available Wife Networks-

Andrino 1.6.5 - Serial Monitor View

and the second of the second o	or of the second se
OF COM 12	
	Send
40 40 10 10 10 10 10 10 10	1 & marchines 1
Setup Done,	
	Mark And South
1. Amrita (-70)	
2. Santosh (-22) *	÷
3. Vardhan's Galary M51 (-67) 4. Vignesh Wiky (-70) #	TO VICE TO MAKE A
5. Amrita (-86) +	
6. Mukund (-62) = 7. Chintu (-71) *	
8. Varun's ROG (-67) *	
9. One Plus about 1-11) +	
10. Amrita (-87) *	
Scan completed.	
And the state of t	- PARK
V Autoscroce Newline -	9600 band 1

```
serial printle (I wifi encryption Type (i) == ENC_TYPE_ NONE) }
    delay (10);
   Serål println 1"");
de ay (5000); I Wait for five seconds before scanning again
(b) 10T Cloud Communication using Thing Speak and NadeMCV-
                                     11 ESP 8266 Wifi a library
   # include < ESP 8266 Wiff. A>
    const char soid = "REPLACE_WITH_ YOUR_ SSID";
    const char + password = REPLACE_WITH_ YOUR_PASSWORD;
const char + hast - "api. thingspeak. com";
    const chart white APT key = "Oxx D4 xxx 07 xx SW xx 8"
    int temp;
    void setup ()
      I Initialize the sensor!
      pinmade 12, OUTPUT);
      pinMade (4, INPVT);
       Serval. Begin (115200);
                                1 Initialize serial communication (VART)
                                   with baced nate of 1, 15, 200 bps
      delay (1000);
       Il connect to With network.
       Wifi begin (said, password);
```

### (b) 10T cloud Communication using Thing Speak and Medemer.

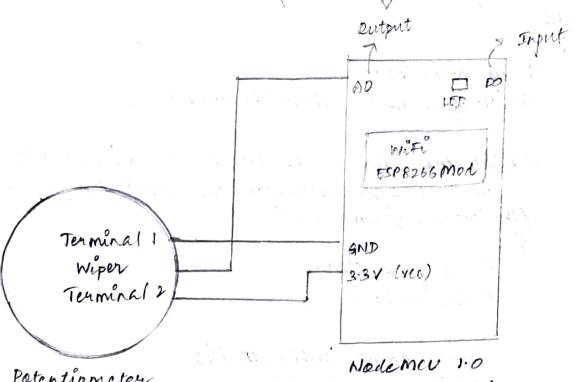
Components Required:

- O Wife \$588266 Board NodeMCV 1.0 (ESP- nº module)
- @ Patentioneter
- @ Battery / Power Supply Cable
  - 1 Connecting Wires

Software required:

- O Anduino IDE (ESP8266 Board Installed)
- @ ThirgSpeak Internet of Thirgs (Bot Braylice) (Attps: // thingspeak com)

Hardware tabelled Dragram



Potentioneter

ESP-DE Module

```
Il Wait until Wifi connection is established:
while (Wifi status () 1 = WL_ CONNECTED)
  delay (500)
z
I The loop function num over and over again forever:
void loop ()
  temp = analog Read (AO); II Read ADC value from BO
  11 make TRP (Transmission Control Protocol) Connections:
  with client client;
   const int AttpPort = 80;
   Il wait until the client (Nade Ma) is connected to the
     Thing Speak Derver:
   of (! client. connect (host, httpPort))
   return;
    I Request to the server:
    client printer (sendthingspeak ());
    delay (1000);
     if (temp >= 100)
    digitalWrite (2, 414A);
```

(b) lot Cloud communication using Thing Speak and Nade mer. 0 0 % EXT COM12 1024 1024 1024 1024 1024 1024 1024 1 Autoscroce nenzine 7/ 115200 band V Andring 1.6.5 - Serial Monitor View Serial Comm: 1024 ESL: Experiment 3 10:54:50 GMT +0530 1000 500 10:40 10:45 10:55 10:50 pate Thing speak. com

```
else
 digital Write (2, LOW);
  Serial print (temp),
  Serval. print ('In');
Il Send the ADC value from Client (Nademac) to Thing Speak
   Server in HTML Format:
String send Thingspeak ()
  String command =
           String ("GET") +
             " Supdate ? key = " +
            WriteAPIKey +
            2 field 1: +
            string (temp) + "INn" +
            " HTTP /1.1 200 OK N/n"+
            "Host: " + host + " \n\n" +
             Connection: close labolalor";
        return command;
g
```

INFERENCE:

Analyze various communication protocols used in the design of portable devices and all simulation results were successfully verified.

#### Experiment 3

#### a) Identification of available WiFi Networks

- 1. Initialize of Serial Communication (UART) with Baud Rate 9600 bps
- 2. Configure WiFi in "Station Mode" of operation
- 3. Scan the available WiFi Networks, which will return the no. of available WiFi networks (n).
- 4. If 'n' is zero, then print "No Networks found"
- 5. If 'n' is non zero, print the SSID and RSSI (Received Signal Strength Indicator) for each networks.
- Initialize of Serial Communication (UART) with Baud Rate 9600 bps Serial.begin(9600);
- > Two modes available
  - 1. Station mode Connect to available WiFi Network
  - 2. AP mode Create its own WiFi Network & Devices can connect to this N/W
- ➤ Identification of available WiFi Networks
  - Scan the available WiFi Networks, which will return the no. of available WiFi networks (n).

```
int n = WiFi.scanNetworks();
```

#### Returns

n - No.of available Networks identified

- If 'n' is zero, then print "No Networks found" if (n == 0)
   Serial.println("no networks found");
- If 'n' is non zero, print the SSID and RSSI (Received Signal Strength Indicator) for each networks.

### b) IoT Cloud Communication using Thingspeak and NodeMCU

- 1. Initialize Serial Communication UART
- 2. Initialize the WiFi Network settings and return the current status (Connected or not).
- 3. Wait until Wifi Connection is established.
- 4. Read ADC value from A0
- 5. Wait until the Client (NodeMCU) is connected to the Thingspeak Server
- 6. Send the **ADC value from Client (NodeMCU) to Thingspeak Server** in HTML Format.