IoT Session 2

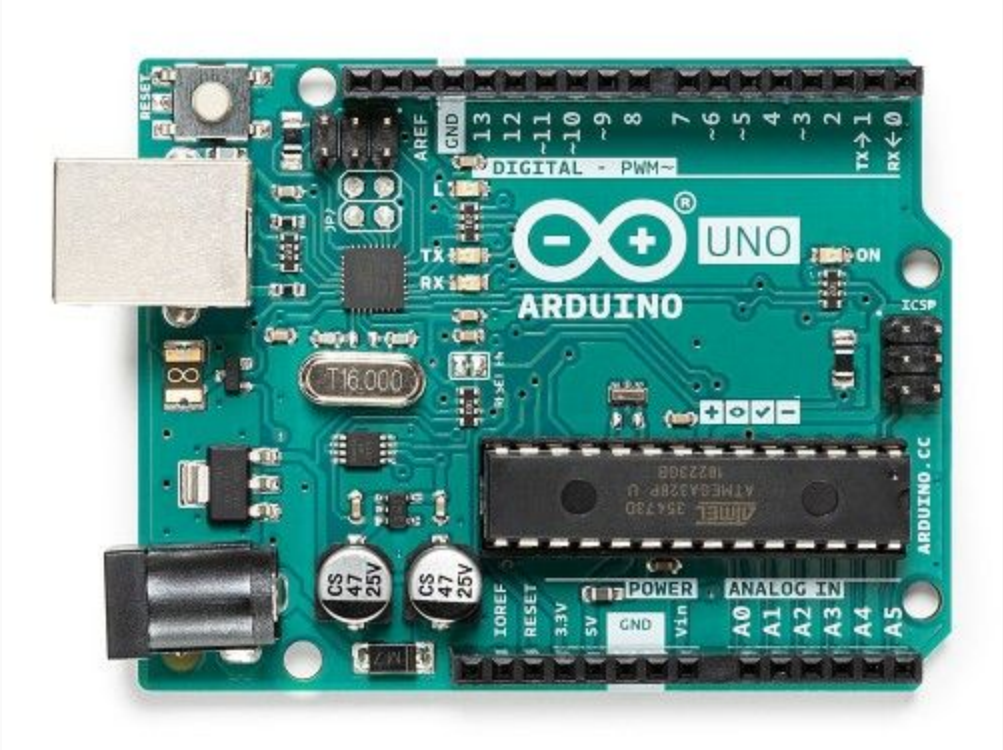
July 19, 2020

Objective

- Discussion on the task given in session 1. (10mins)
- Controlling LED brightness with potentiometer.
- Integration of temperature sensor with Arduino UNO and NodeMCU.

Arduino Uno

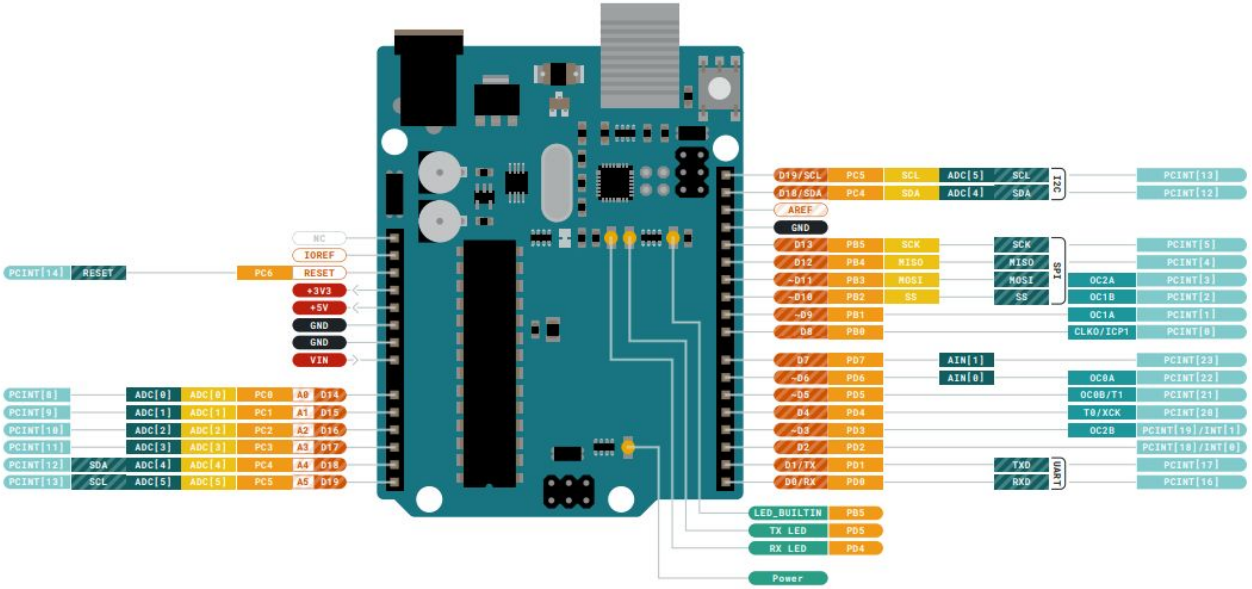
AVR® 8-Bit Microcontroller Family


RESET
AREF
GND
13 12 ~11 ~10 ~9 8 7 ~6 ~5 4 ~3 2 TX→1 RX←0
DIGITAL - PWM~
UNO
ON
ICSP
TX
RX
ARDUINO
T16.000
ATMEGA328P-U
ARDUINO.CC
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
Vin
A0 A1 A2 A3 A4 A5

ARDUINO

ARDUINO UNO REV3

STORE.ARDUINO.CC/UNO-REV3



Ground
Power
LED
Internal Pin
SWD Pin

Digital Pin
Analog Pin
Other Pin
Microcontroller's Port
Default

Analog
Communication
Timer
Interrupt
Sercom

MAXIMUM current per I/O pin is 20mA

MAXIMUM current per +3.3V pin is 50mA

VIN 6-20 V input to the board.

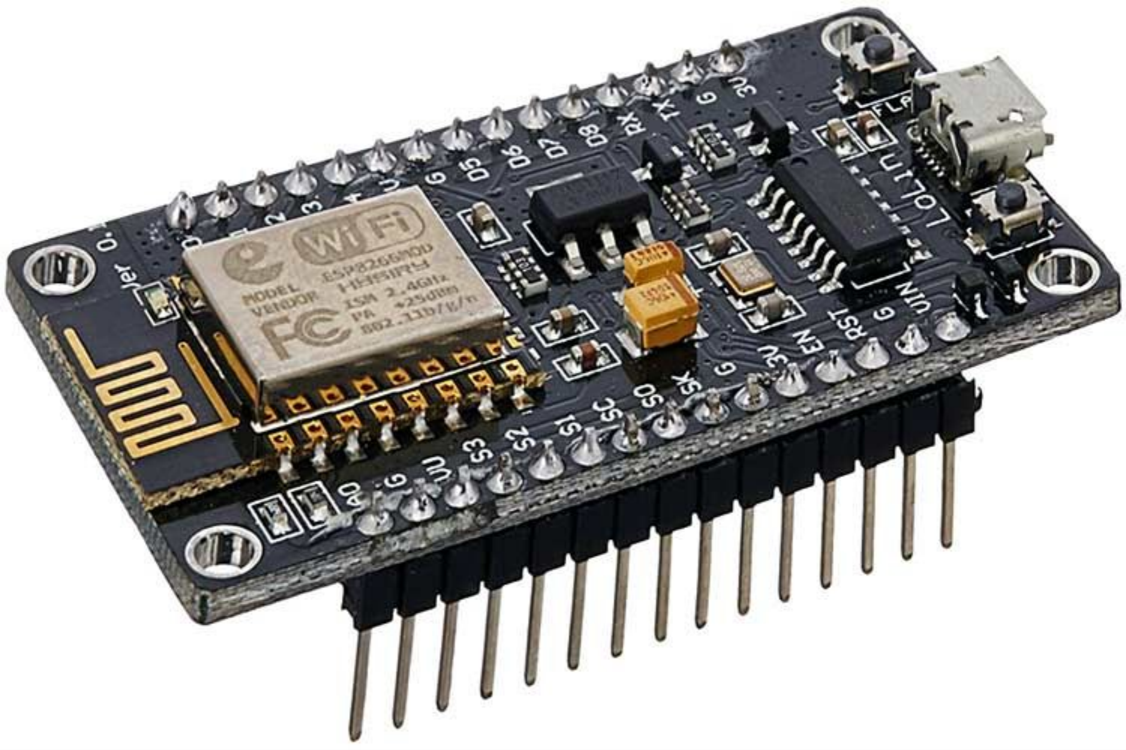
ARDUINO.CC

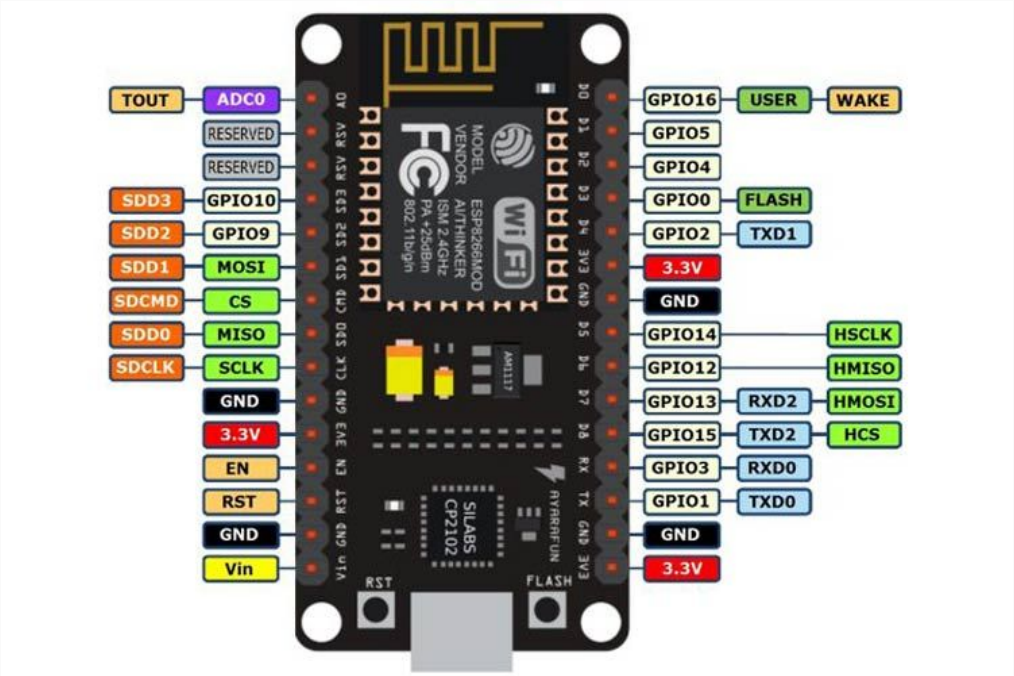
Last update: 17/06/2020

Specifications

- Microcontroller ATmega328P
- Digital I/O Pins 14 (of which 6 provide PWM output)
- Analog Input Pins 6
- Flash Memory 32 KB (ATmega328P) of which 0.5 KB used by bootloader
- SRAM 2 KB (ATmega328P)
- Clock Speed 16 MHz

NodeMCU ESP8266


WiFi
ESP8266MOD
MODEL
VENDOR
ISM 2.4GHz
PA +25dBm
802.11b/g/n
D5
D6
D7
D8
RX
TX
G
3V
EN
RST
G
VIN
A0
G
VU
S3
S2
S1
SC
SO
SK
G
3V

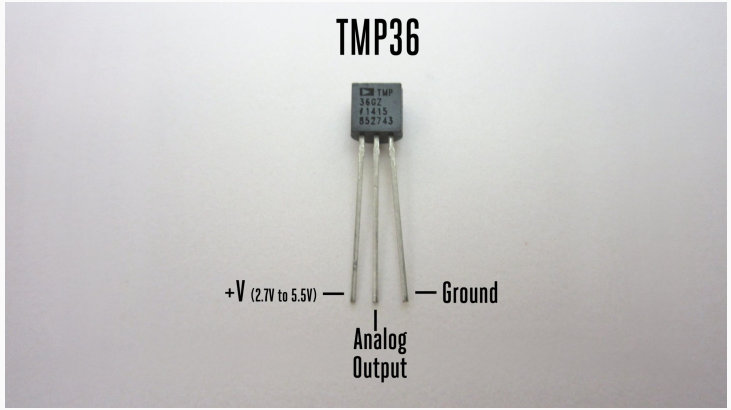

TOUT
ADC0
RESERVED
RESERVED
SDD3
GPIO10
SDD2
GPIO9
SDD1
MOSI
SDCMD
CS
SDD0
MISO
SDCLK
SCLK
GND
3.3V
EN
RST
GND
Vin
GPIO16
USER
WAKE
GPIO5
GPIO4
GPIO0
FLASH
GPIO2
TXD1
3.3V
GND
GPIO14
HSCLK
GPIO12
HMISO
GPIO13
RXD2
HMOSI
GPIO15
TXD2
HCS
GPIO3
RXD0
GPIO1
TXD0
GND
3.3V
RST
FLASH
SILABS
CP2102
AYARAFUN
ESP8266MOD
AITHINKER
ISM 2.4GHz
PA +25dBm
802.11b/g/n
MODEL
VENDOR
AM1117

Specifications

- Tensilica 32-bit RISC CPU Xtensa LX106
- NodeMCU has 16 general purpose input-output pins on its board
- A0 Used to measure analog voltage in the range of 0-3.3V
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz

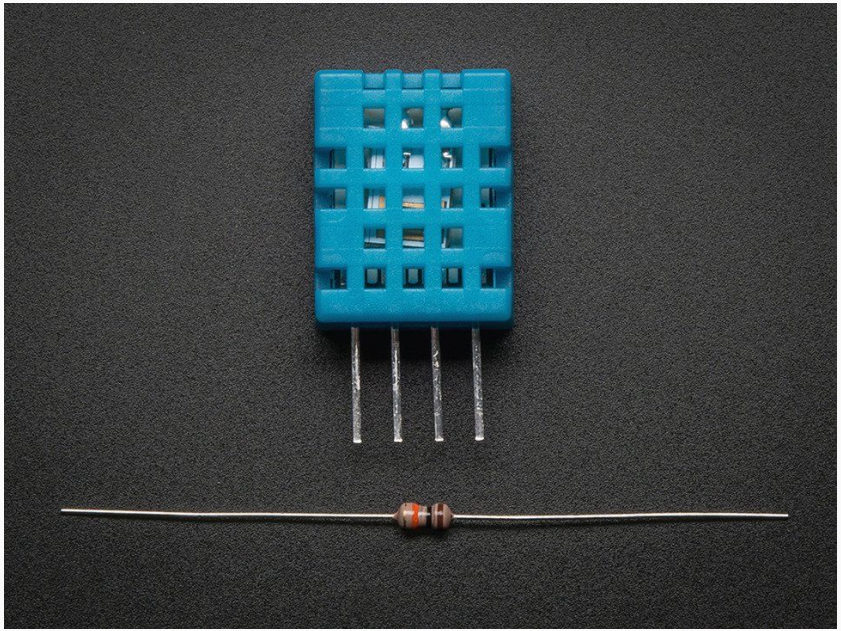
Sensors

TMP36



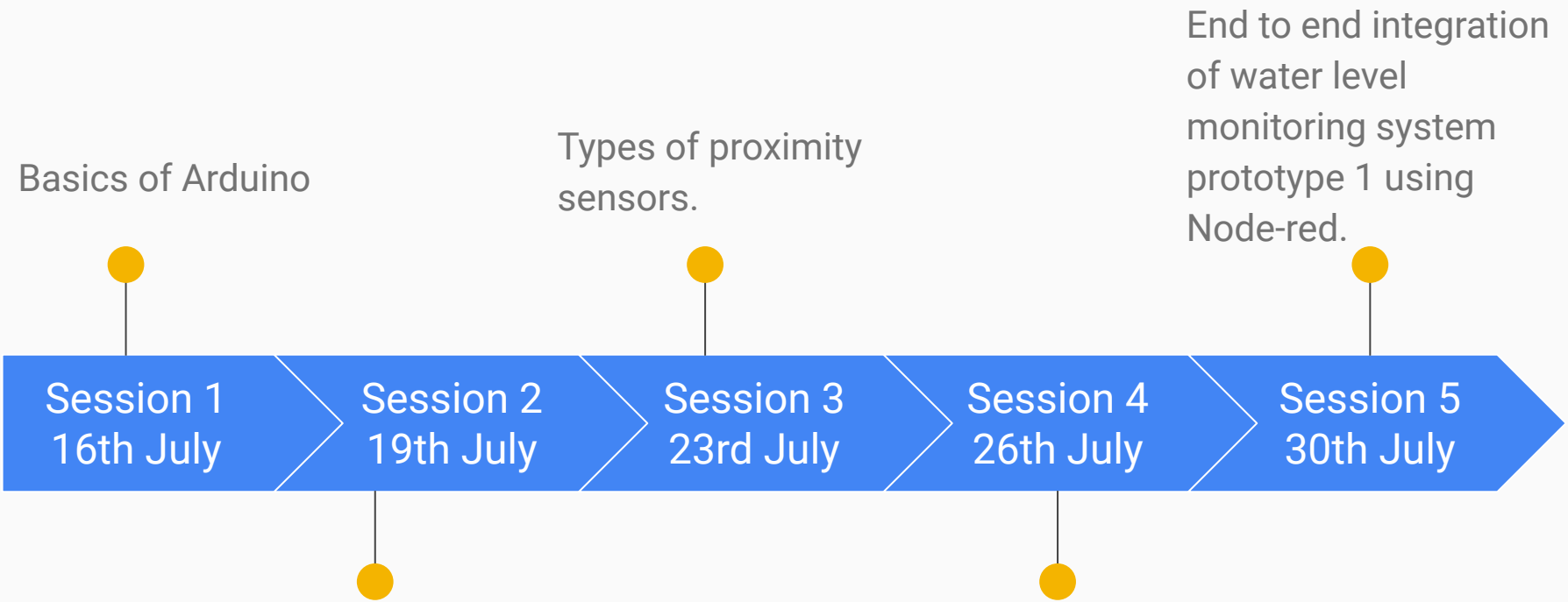
Temperature sensor

DHT11



Temperature-humidity sensor

Hands-on

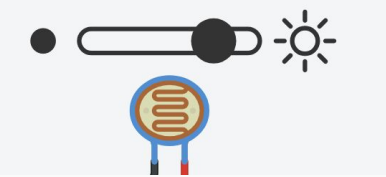

Basics of Arduino
Types of proximity sensors.
End to end integration of water level monitoring system prototype 1 using Node-red.
Session 1
16th July
Session 2
19th July
Session 3
23rd July
Session 4
26th July
Session 5
30th July
Sensor integration with Arduino and nodemcu.
Introduction to MQTT and Node-red.

Task

Home automation.

Hardware - Photoresistor, LED

Simulation tool - TinkerCad.



Description :

Control an LED with a photoresistor. Whenever the ambience light is above certain threshold the LED should turn off and vice-versa.

El Fin!