



Globalcode

ARDUINO PROGRAMMING ON THE IOT SURFBOARD



FILES FOR THIS CLASS

[HTTPS://PORTALALUNO.TOOLSCLOUD.NET/REDMINE/PROJECTS/IOTSURFBOARD/FILES](https://portalaluno.toolscloud.net/redmine/projects/iotsurfboard/files)

□ PRESENTATION: IOT_SURFING_CLASS_5_EN.PDF



ARDUINO PROGRAMMING

- ❑ THE ARDUINO PROGRAMMING LANGUAGE IS BASED ON THE **WIRING LANGUAGE** WHICH IS BASED ON **C/C++**
- ❑ USES **GCC AVR** FOR COMPILING TO MICROCONTROLLERS **ATMEL 8 BITS**, AS THE ARDUINO NANO USED ON THE IOT SURFBOARD.
- ❑ MUCH **SIMPLER** THAN C++
- ❑ ARDUINO PROGRAMS ARE CALLED **SKETCHES**

MINIMAL SKETCH FOR ARDUINO

- EVERY SKETCH FOR ARDUINO HAS AT LEAST TWO FUNCTIONS:
 - **SETUP()**: EXECUTED ONLY ONCE WHEN WE TURN ON THE ARDUINO USED TO INITIALIZE AND SET THE INITIAL VALUES FOR YOUR SKETCH
 - **LOOP()**: IT'S AN INFINITE LOOP USED TO CONTROL YOUR BOARD



MINIMAL SKETCH FOR ARDUINO

```
void setup() {  
    // put your setup code here, to run once:  
  
}  
  
void loop() {  
    // put your main code here, to run repeatedly:  
  
}
```



ARDUINO PINS / PORTS

- ❑ ARDUINO HAS PINS TO CONNECT COMPONENTS THAT CAN'T BE EASILY CONNECTED TO A REGULAR COMPUTER!
- ❑ PINS CAN COMMUNICATE USING: DIGITAL, ANALOG CONVERTER, INTERRUPTION, PWM, I2C, SPI, SERIAL
- ❑ IOT SURFBOARD COMES WITH SEVERAL COMPONENTS CONNECTED TO THE ARDUINO PINS



IOT SURFBOARD PINS MAP

Pin	Nome	Componente
Digital 10	red	Red Led and Transistor T2
Digital 6	green	Green Led (PWM) and Transistor T3
Digital 5	blue	Blue Led (PWM) and Transistor T4
Digital 4	relay	Relay
Digital 16	speaker	Speaker
Analog 0	alcohol	Alcohol Sensor
Analog 1	pot	Potentiometer
Analog 3	light	Light

IOT SURFBOARD PINS MAP

Porta	Nome	Componente
Digital 8	temp	Temperature
Digital 8	humidity	Humidity
Digital 12 e 13	distance	Distance Sensor (not included / optional)
Digital 11	transistor	Transistor T1
Digital 3	-	Infrared emissor
Digital 2	-	Action Button
Digital 7	-	Infrared receiver
Analog 4 5	clock	Realtime clock

USING THE DIGITAL PIN: BLINK THE RED LED

```
void setup() {  
    pinMode(10, OUTPUT);  
}  
  
void loop() {  
    // put your main code here, to run repeatedly:  
    digitalWrite(10, HIGH);  
    delay(1000);  
    digitalWrite(10, LOW);  
    delay(1000);  
}
```



USING THE PWM PIN: GREEN LED

```
void setup() {  
    // put your setup code here, to run once:  
}  
  
void loop() {  
    // put your main code here, to run repeatedly:  
    for(int x=0;x<256;x++) {  
        analogWrite(6, x);  
        delay(5);  
    }  
    for(int x=255;x>-1;x--) {  
        analogWrite(6, x);  
        delay(5);  
    }  
}
```

USING THE ANALOG PIN: READING THE LIGHT SENSOR

```
void setup() {  
  // put your setup code here, to run once:  
  Serial.begin(9600);  
}  
  
void loop() {  
  // put your main code here, to run repeatedly:  
  Serial.println(analogRead(3));  
}
```



LIVE DEMOS



SUMMARY

- ❑ IOT SURFBOARD CAN BE PROGRAMMED WITH ARDUINO
- ❑ COMPONENTS, SENSORS AND ACTUATORS ARE CONNECTED TO THE ARDUINO PINS
- ❑ KEEP THE PINS MAP ALWAYS AT HAND!
- ❑ YOU CAN USE YOUR IOT SURFBOARD AS A CONVENTIONAL ARDUINO AND USE ANY ARDUINO COMPONENT ON IT!

IOT SURFBOARD + ARDUINO = LIVELONG!

