



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

# IOT SURFBOARD PINS MAP

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

