Practical Arduino Projects

This booklet was created as a result of the activities carried out in the erasmus project named "Open Your Doors to Digital Age" as a project output..

OPEN YOUR DOORS TO DIGITAL AGE

2019-1-TR01-KA229-074730

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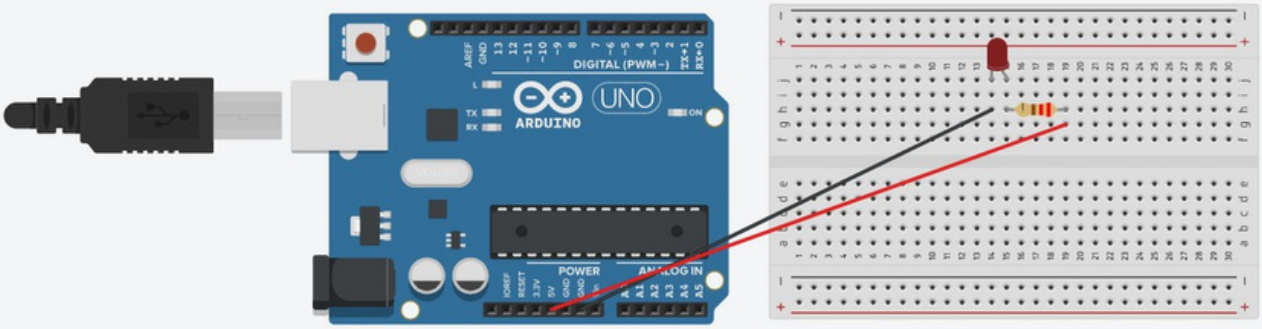
LET'S TURN ON A LED

EQUIPMENTS

- Arduino UNO
- USB Cable
- Breadboard
- LED
- 220 or 330 Ohm Resistance
- Jumper Cables

The Circuit



For the Video:

https://youtu.be/lglww2hl8jE

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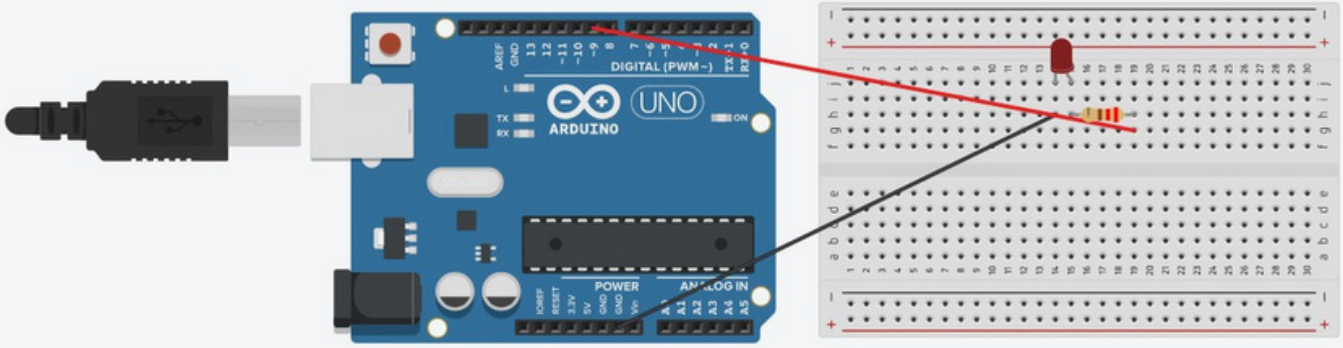
BLINKING LED

EQUIPMENTS

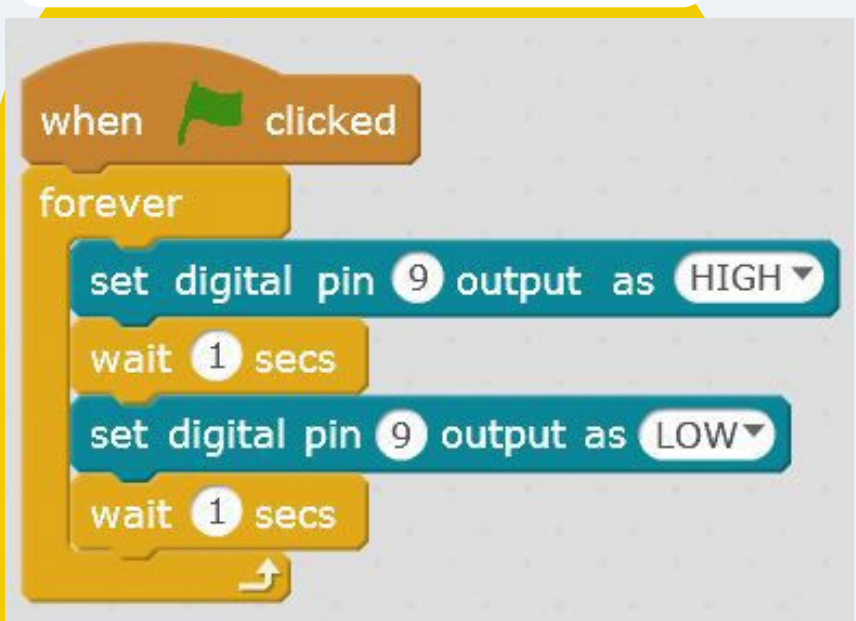
- Arduino UNO
- USB Cable
- Breadboard
- LED
- 220 or 330 Ohm Resistance
- Jumper Cables

The Circuit



If you connect the longest leg of the LED to a digital pin, You can control it. At this time we connect it to the 9th digital pin to control it.
TIP!!! If you want to check your circuit if it is correct, You can connect the longest leg of LED 5V. Because 5V always provides electrical current. But digital pins provide electrical current according to codes... So that you can control the digital pin by coding, but not 5V!!!

Mblock Code



For the Video

https://youtu.be/q5DYN8tZu-o

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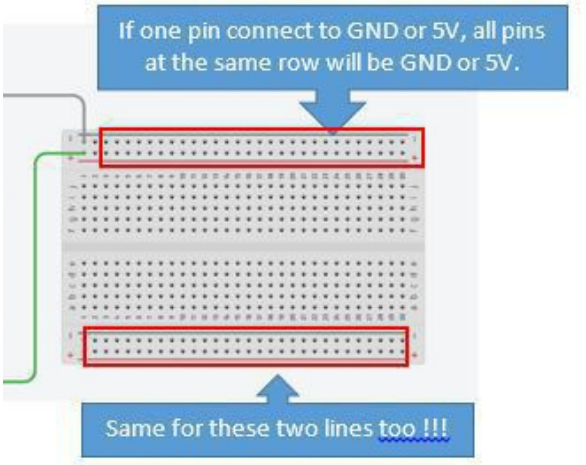
KNIGHT RIDER LEDS (CYLON EYE)

EQUIPMENTS

- Arduino Uno & USB Cable
- Breadboard
- 4 LED or more
- 4 220 ohm resistors
- Jumper wires

TIP!

There are just 3 GND pins. Does it mean that more than 3 led cannot be turned on?



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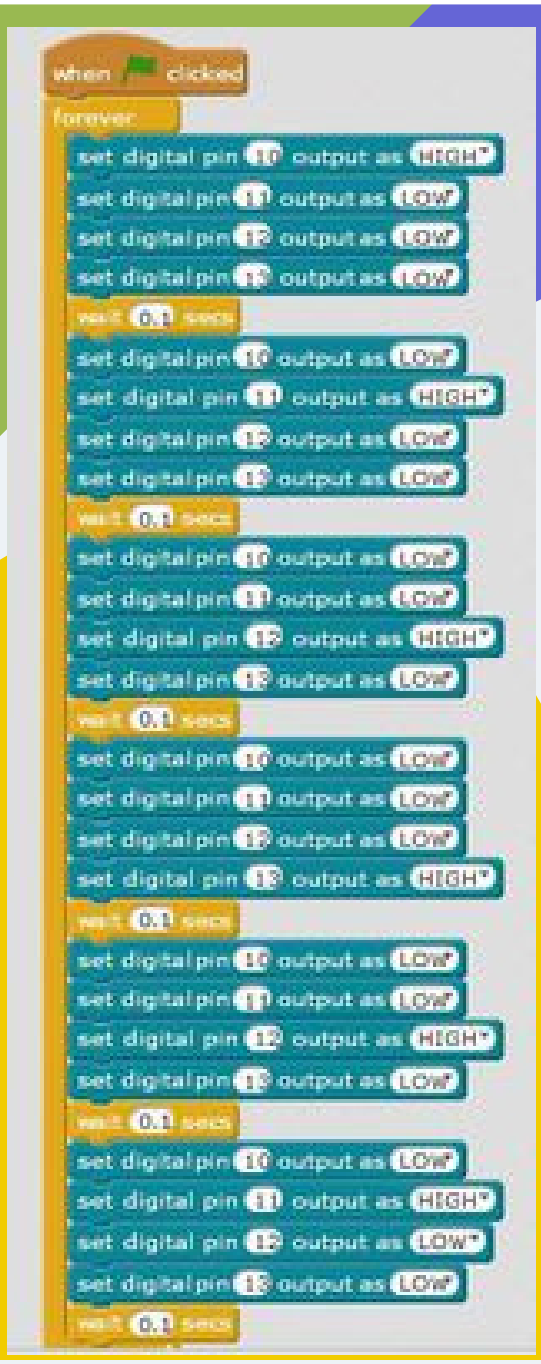
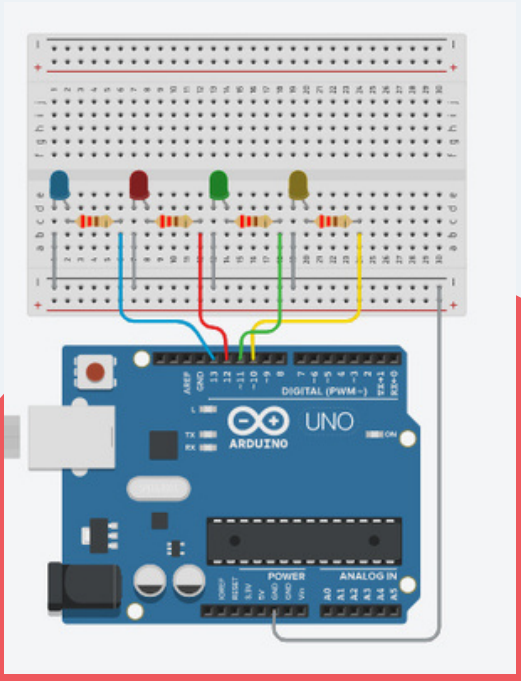


The Circuit



For the Video

https://youtu.be/ldsH8nJqJY8
https://youtu.be/q5DYN8tZu-o

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LDR

EQUIPMENTS

- Arduino Uno & USB Cable
- Breadboard
- 1 LED or more
- 1 220 ohm resistors
- 1 10K ohm resistors
- Jumper wires

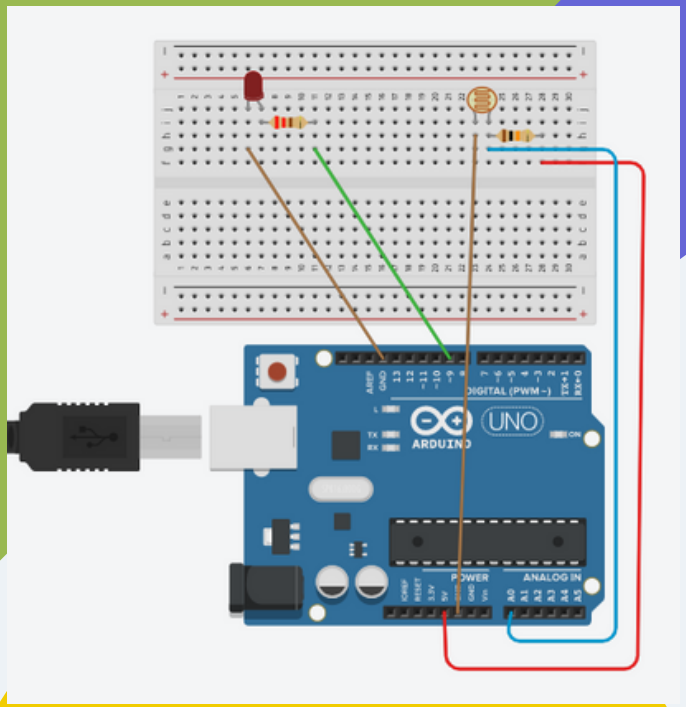
What is LDR?

It stands for Light Dependent Resistor or Photoresistor, which is a passive electronic component, basically a resistor which has a resistance that varies depending on the light intensity.

How does it work?

The resistance is very high in darkness, almost high as 1MΩ but when there is light that falls on the LDR, the resistance is falling down to a few KΩ (10-20kΩ @ 10 lux, 2-4kOmega; @ 100 lux) depending on the model.

The Circuit



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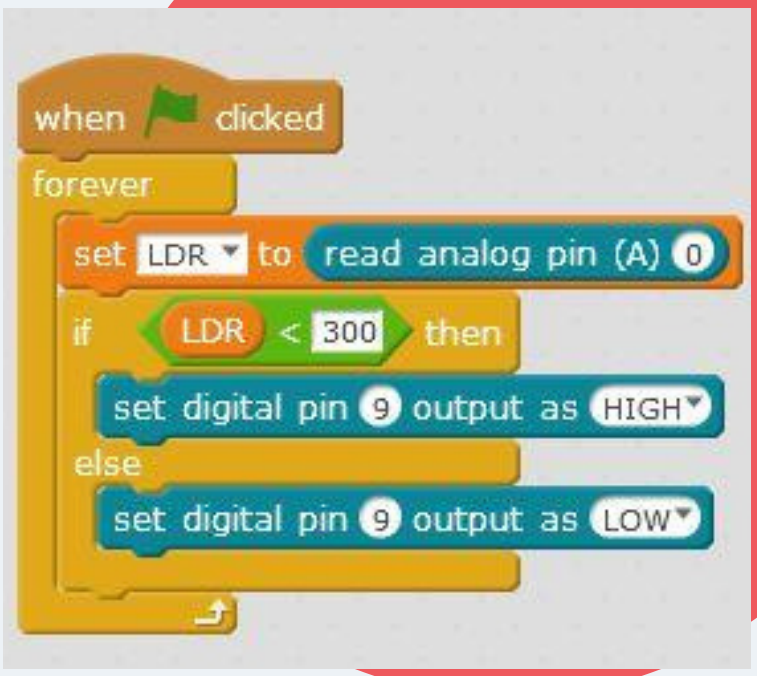

For the Video

https://youtu.be/xrCGCbl0xuE

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MEASURE THE TEMPERATURE WITH LM35 SENSOR

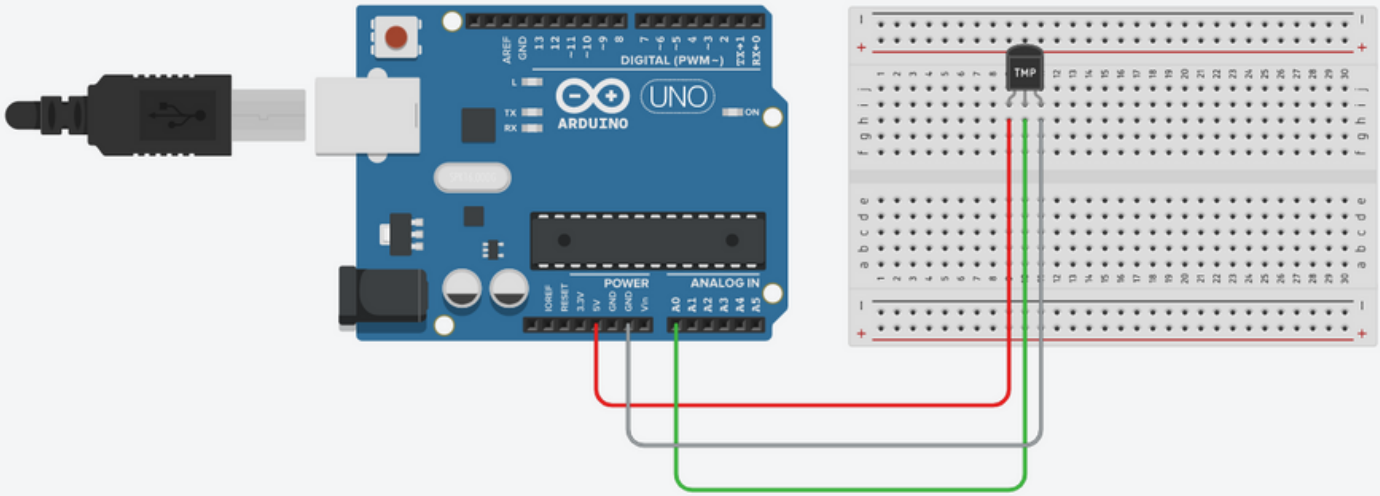
EQUIPMENTS

- Arduino Uno & USB Cable
- Breadboard
- 1LM35
- Jumper wires

WHAT IS THE LM35 SENSOR?

LM35 is an integrated analog temperature sensor whose electrical output is proportional to Degree Centigrade.

The Circuit



Mblock Code

For the Video

https://youtu.be/zfL599GOa0I

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PARK SENSOR WITH ULTRASONIC SENSOR & LEDs

EQUIPMENTS

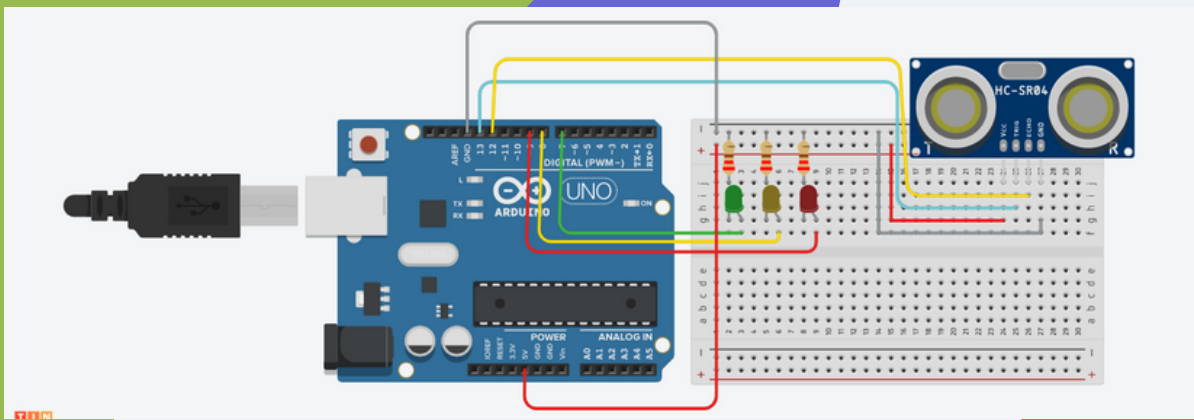
- Arduino Uno & USB Cable
- Breadboard
- Ultrasonic sensor HR –SC04
- 3leds
- 3 220 OHM resistors
- Jumper cable

WHAT IS THE ULTRASONIC SENSOR?

Ultrasonic distance sensor measures distance by sending ultrasound (40 kHz) and this ultrasound will bounce off the obstacle and return to the sensor.

Distance is measured by time it takes the ultrasound to travel from the sensor and back to the sensor.

The Circuit



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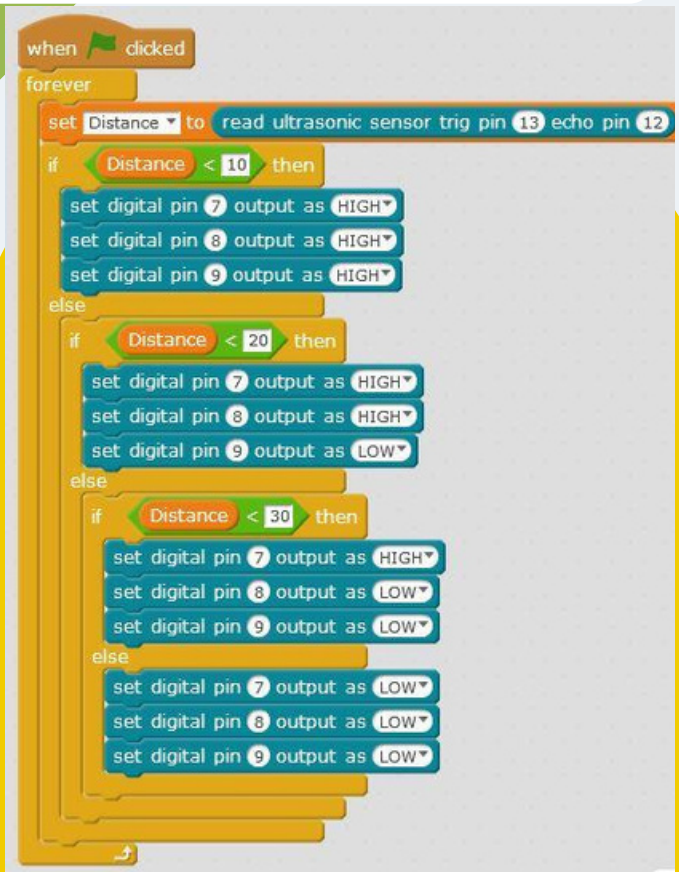

For the Video

https://youtu.be/1gBoByl8wps

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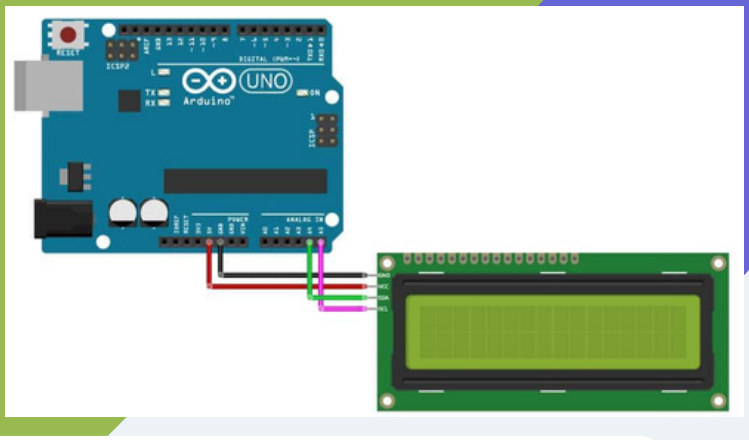
LCD WITH I2C MODULE

EQUIPMENTS

- Arduino Uno & USB Cable
- 1 LCD with I2C Module
- Jumper wires

The Circuit



Mblock Code

WHAT IS THE LCD?

Liquid Crystal Display

LCDs like these are very popular and broadly used in electronics projects as they are good for displaying information like sensors data from your project.

The 16x2 LCD has a total of 16 pins. As shown, eight of the pins are data lines (pins 7-14), two are for power and ground (pins 1 and 16), three are used to control the operation of LCD (pins 4-6), and one is used to adjust the LCD screen brightness (pin 3). The remaining two pins (15 and 16) power the backlight.

WHAT IS THE I2C MODULE?

Wiring an I2C LCD is a lot easier than connecting a standard LCD. You only need to connect 4 pins instead of 12.

You can buy LCD with I2C however if you ordered LCD and IC2 module separately, you have to soldered them each other.

For the Video

https://youtu.be/BvS7k-wIWaM

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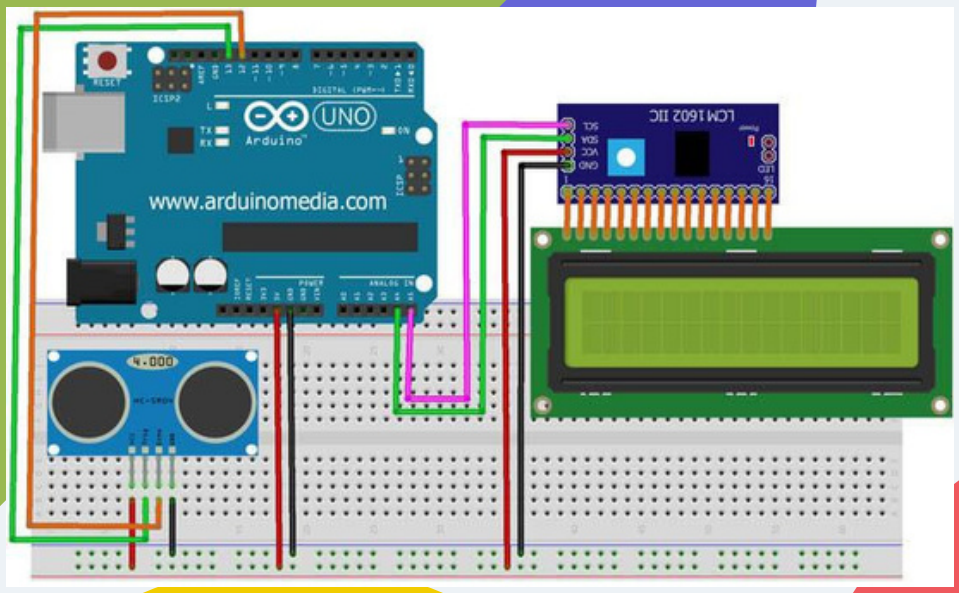
MEASURE THE DISTANCE WITH THE ULTRASONIC SENSOR AND LCD

EQUIPMENTS

- Arduino Uno & USB Cable
- Breadboard
- 1 HC-SR04 Ultrasonic Sensor
- 1 LCD with I2C Module
- Jumper wires

The Circuit



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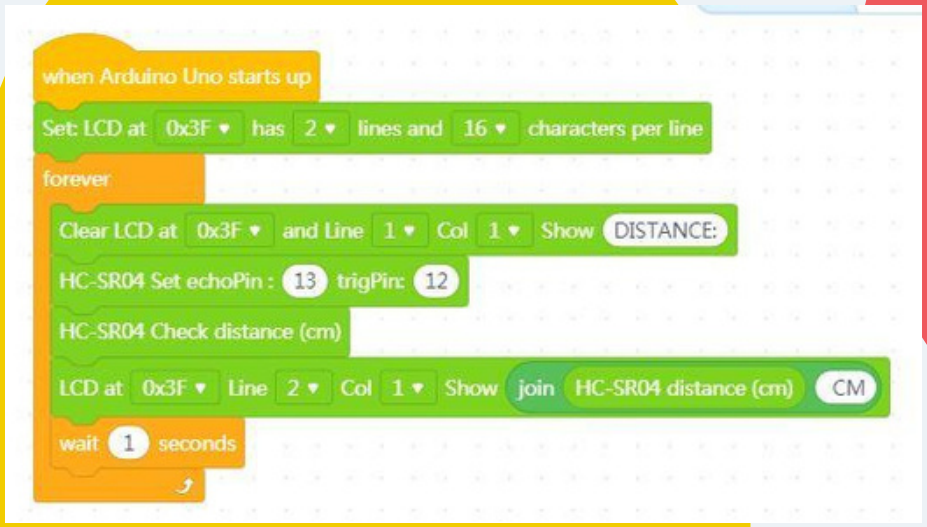

For the Video

https://youtu.be/f9v9jMb753w

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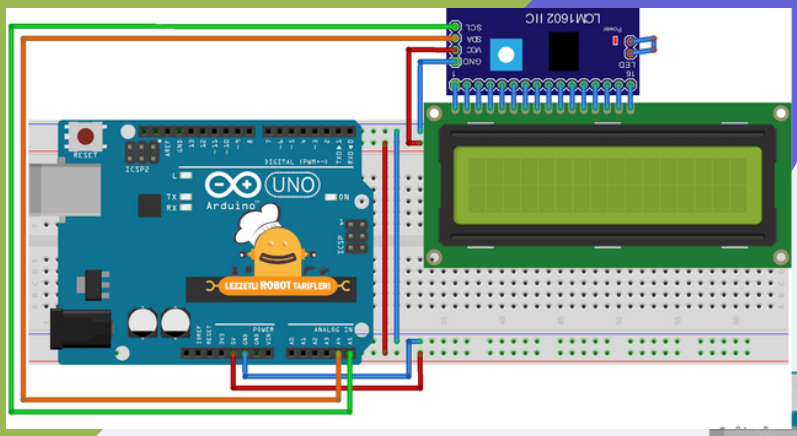
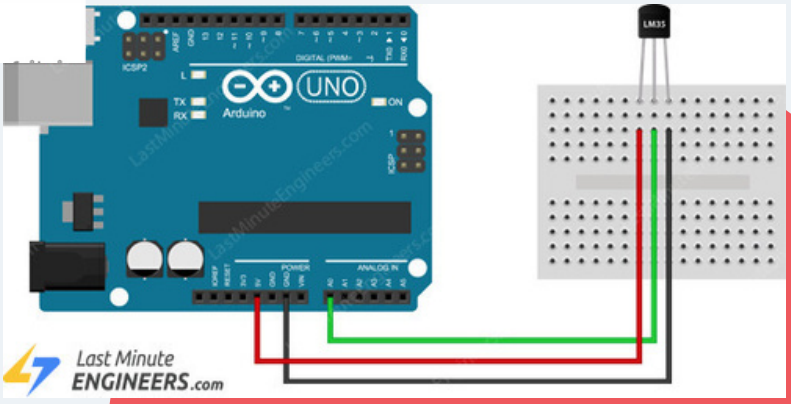
THERMOMETER

EQUIPMENTS

- Arduino Uno & USB Cable
- Breadboard
- 1 LM35
- 1 LCD with I2C Module
- Jumper wires

The Circuit





Mblock Code

For the Video

https://youtu.be/k6DEiWhcfy4

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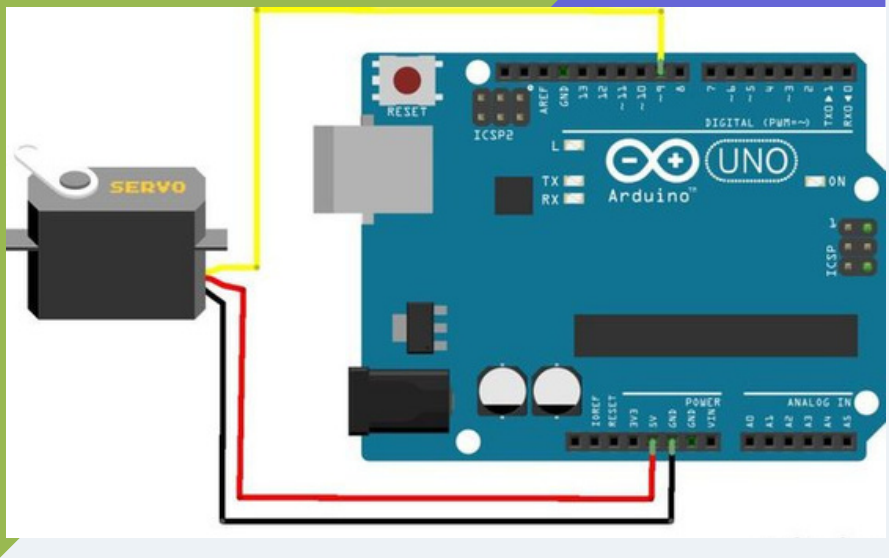
SERVO MOTOR

EQUIPMENTS

- Arduino and USB connection Cable
- Breadboard
- Servo motor

The Circuit

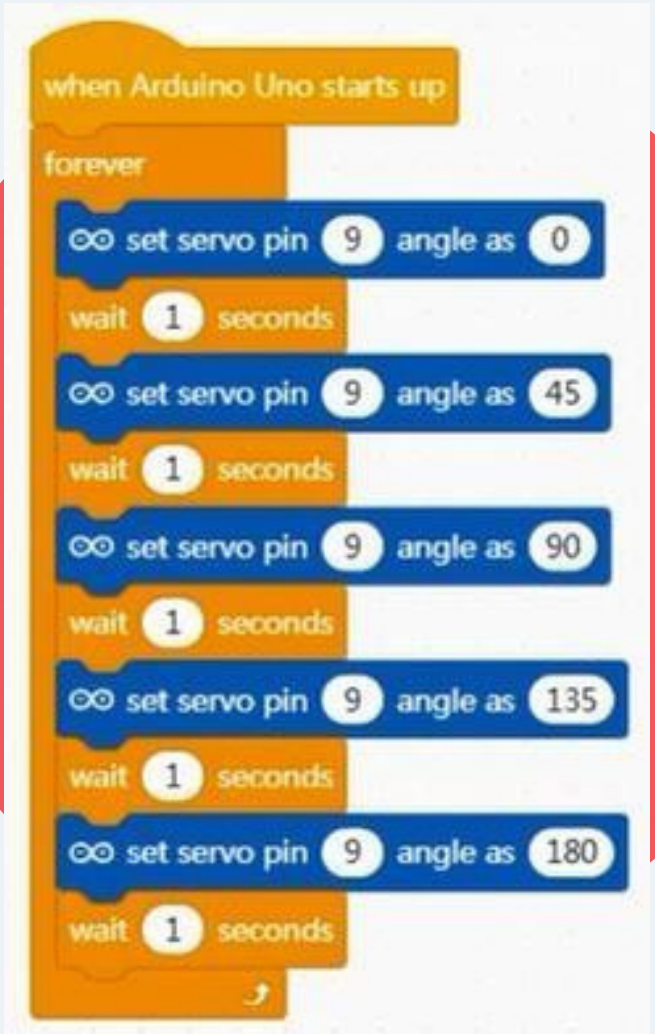


WHAT IS THE SERVO MOTOR?

A Servo Motor is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal. As long as the coded signal exists on the input line, the servo will maintain the angular position of the shaft.

Usually, they have a servo arm that can turn 180 degrees. Using the Arduino, we can tell a servo to go to a specified position and it will go there. As simple as that!

Mblock Code



For the Video

https://youtu.be/Fy7cwyKUSGk

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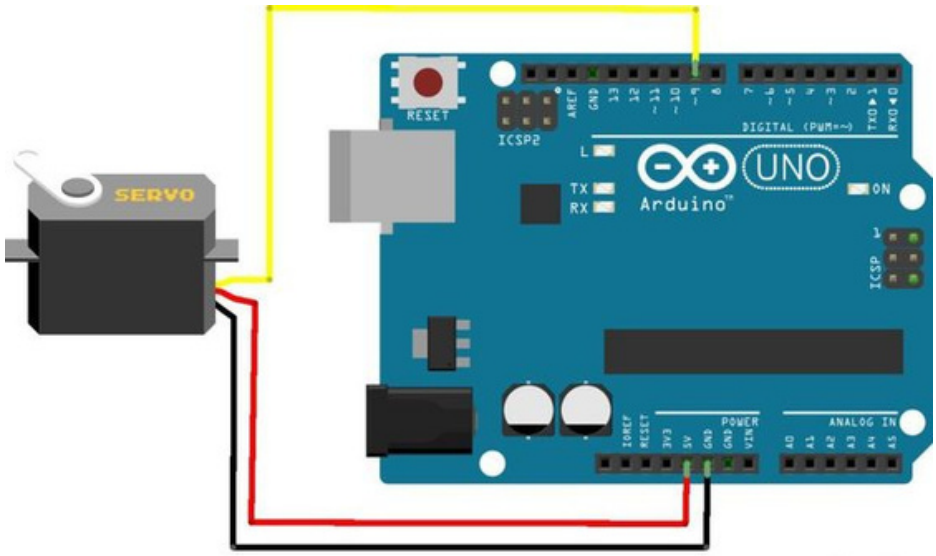
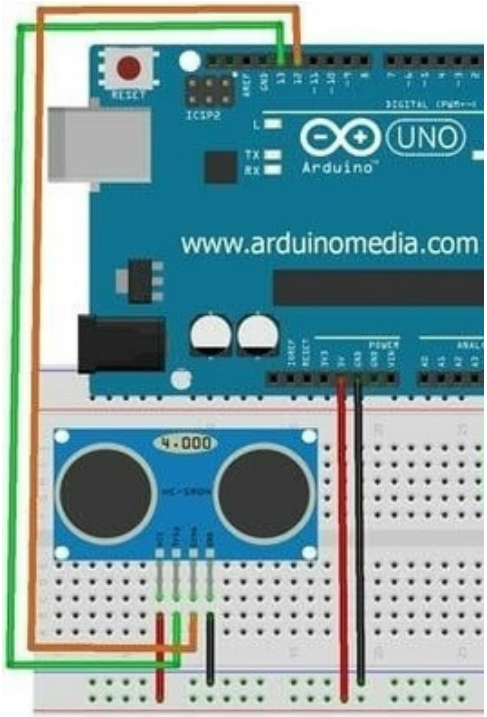
AUTO OPENING BOX WITH SERVO MOTOR

EQUIPMENTS

- Arduino and USB connection Cable
- LCD Monitor with I2c module
- Ultra sonic Distance Sensor
- Servo motor.
- Jumper cable

The Circuit





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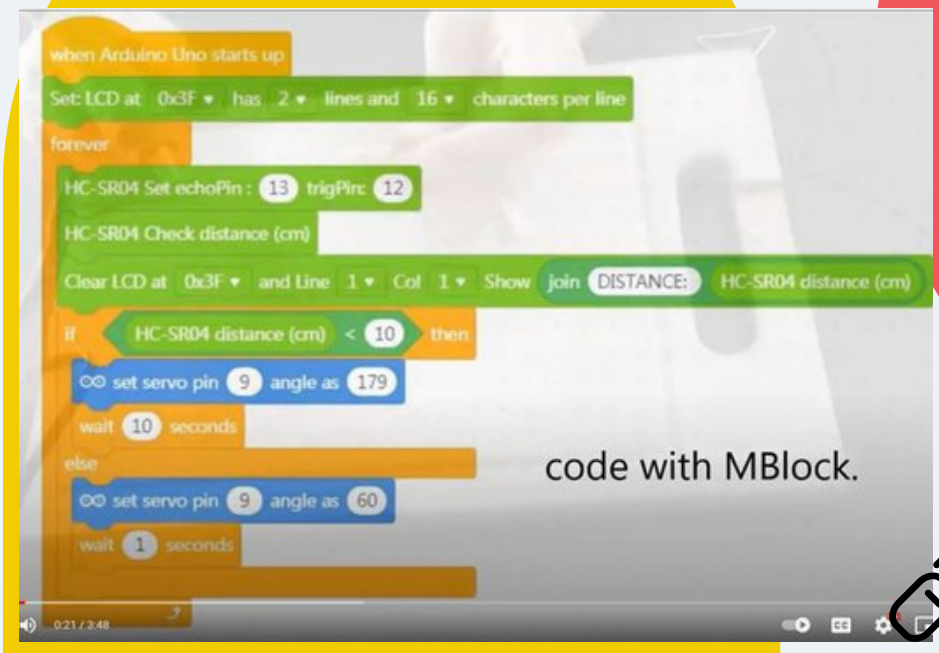

For the Video

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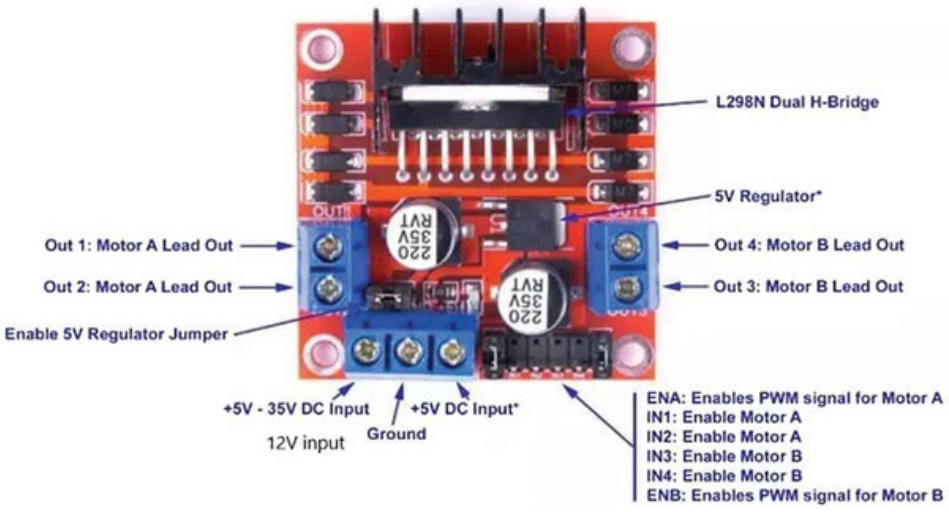
DC MOTOR

WHAT IS THE DC MOTOR?

A DC motor (Direct Current motor) is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy.
A DC motor is the most common type of motor. ... If you connect these two leads directly to a battery, the motor will rotate. If you switch the leads, the motor will rotate in the opposite direction.
Warning – Do not drive the motor directly from Arduino board pins. This may damage the board.

L298N DRIVER TO CONTROL THE MOTOR

The L298N is a dual H-Bridge motor driver which allows speed and direction control of two DC motors at the same time. The module can drive DC motors that have voltages between 5 and 35V, with a peak current up to 2A.



For the Video

https://youtu.be/oFJAiyqAN5Q

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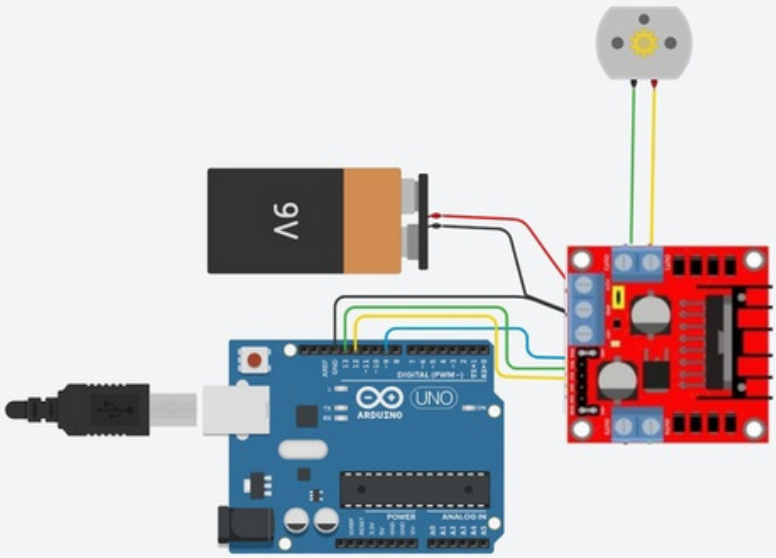
FAN WITH THE SPEED CONTROL

EQUIPMENTS

- Arduino
- DC Motor
- L298n motor Driver
- Jumper Cable

The Circuit



For the Video

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Mblock Code

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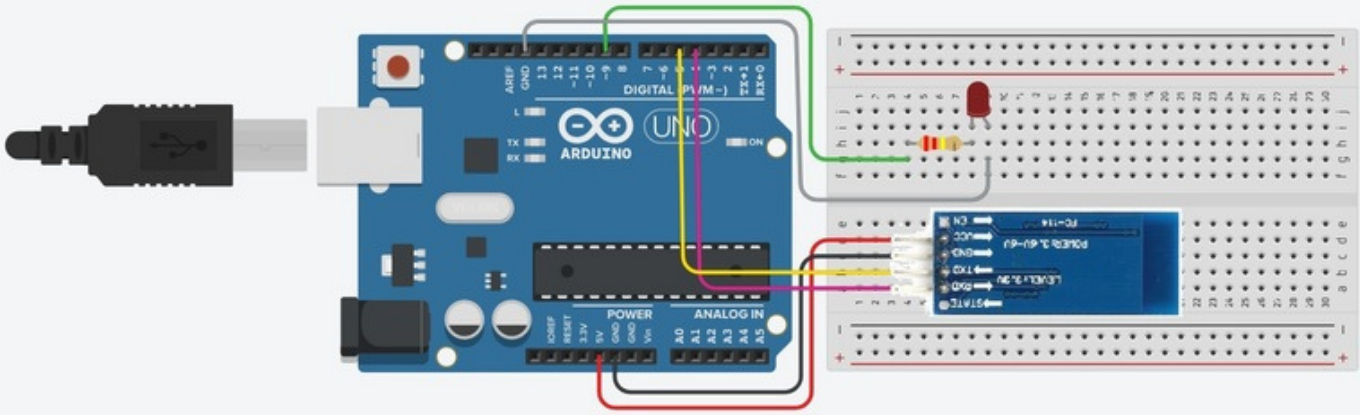
TURN ON THE LED WITH BLUETOOTH CONTROL

EQUIPMENTS

- Arduino Uno & USB Cable
- HC06
- LED
- 220 ohm resistor
- Female and male Jumper cables
- Mobil phone

The Circuit



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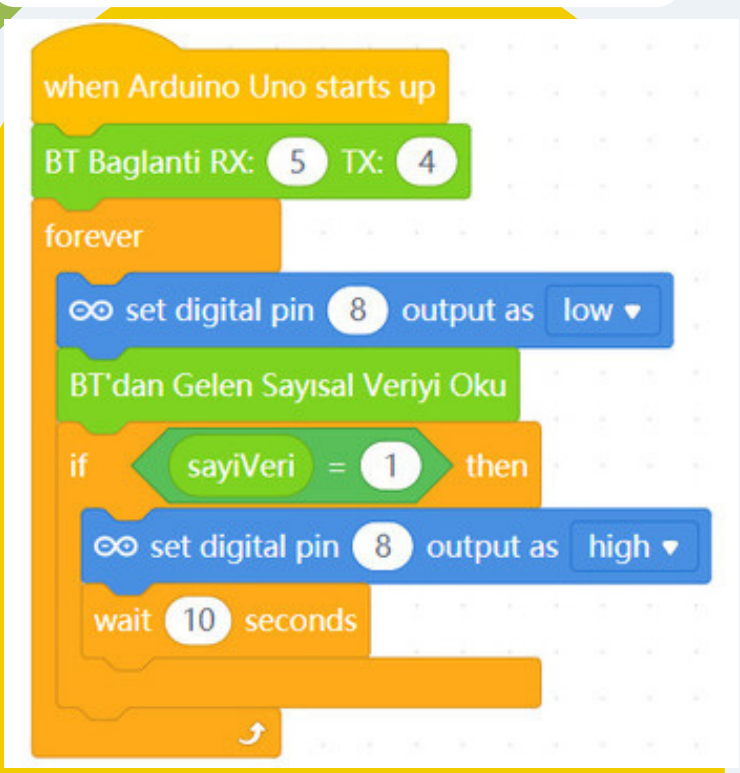

For the Video

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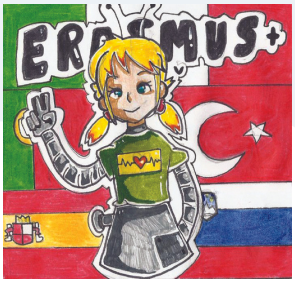
STUDENTS' PROJECTS EXHIBITED IN PORTUGAL LTT



ITALY

PORTUGAL

All these projects exhibited in Portugal are related with LEDs & sensors!

SLOVENIA

SPAIN

TURKEY

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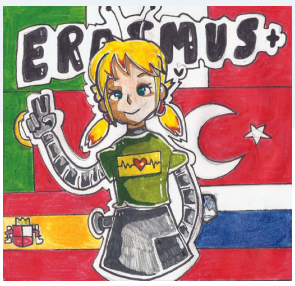
STUDENTS' PROJECTS EXHIBITED IN SLOVENIA LTT



ITALY

PORTUGAL

SLOVENIA

All these projects exhibited in Slovenia included motor.

SPAIN

TURKEY

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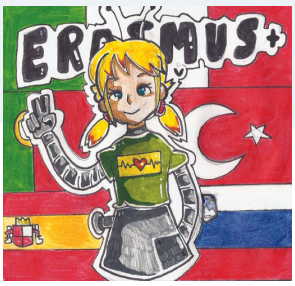
STUDENTS' PROJECTS EXHIBITED IN TURKEY LTT



ITALY

PORTUGAL

SLOVENIA

SPAIN

TURKEY

All these projects exhibited in Turkey included bluetooth module!

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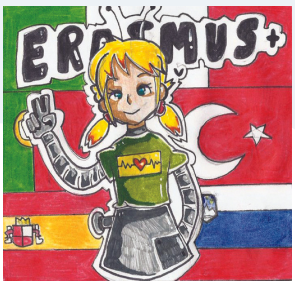
STUDENTS' PROJECTS EXHIBITED IN ITALY LTT



ITALY

PORTUGAL

SLOVENIA

SPAIN

TURKEY

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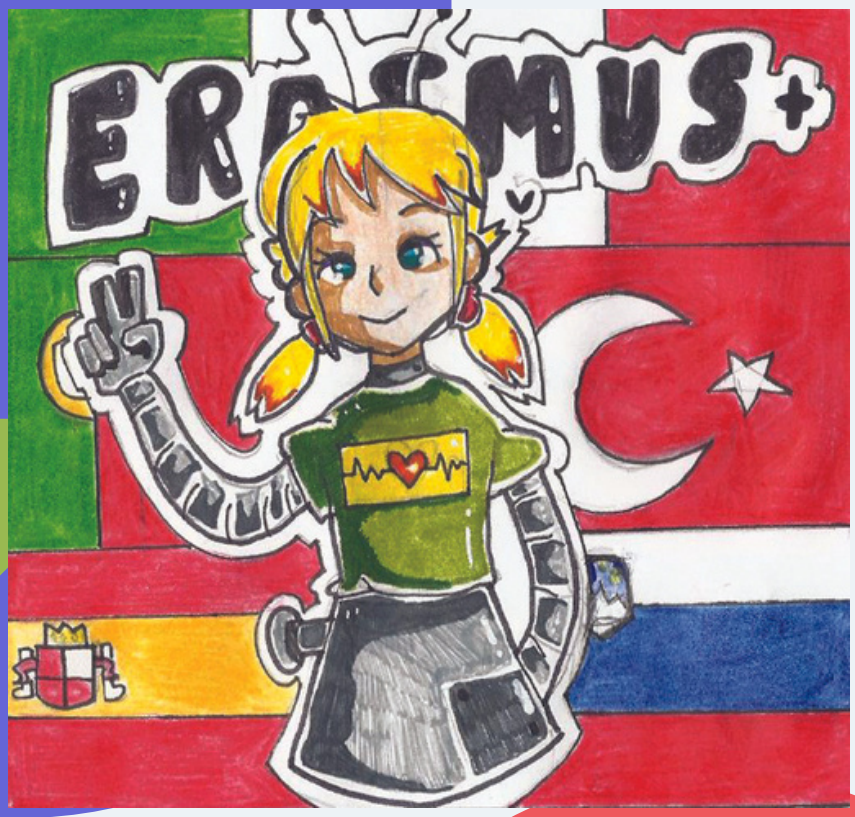
OPEN YOUR DOORS TO DIGITAL AGE



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https://openyourdoorstodig.wixsite.com/erasmus

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