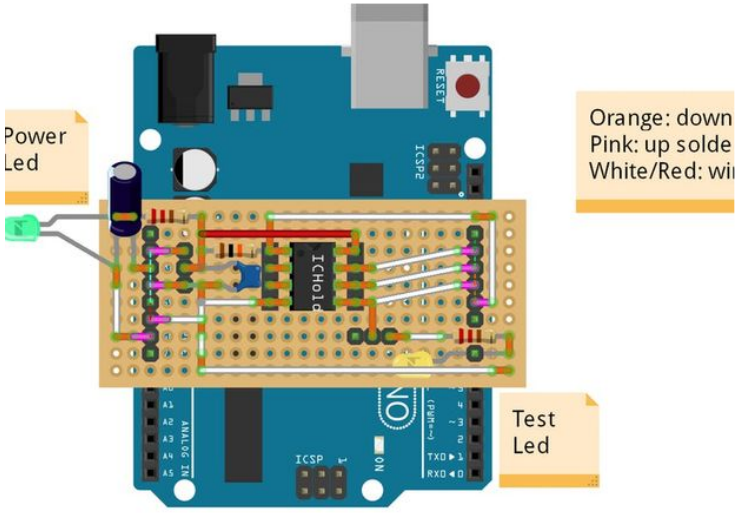
ATtiny Programmer Board (ArduinoUNO As ISP)

by xxreef

ATtiny13/ATtiny13a/ATtiny25/ATtiny45/ATtiny85

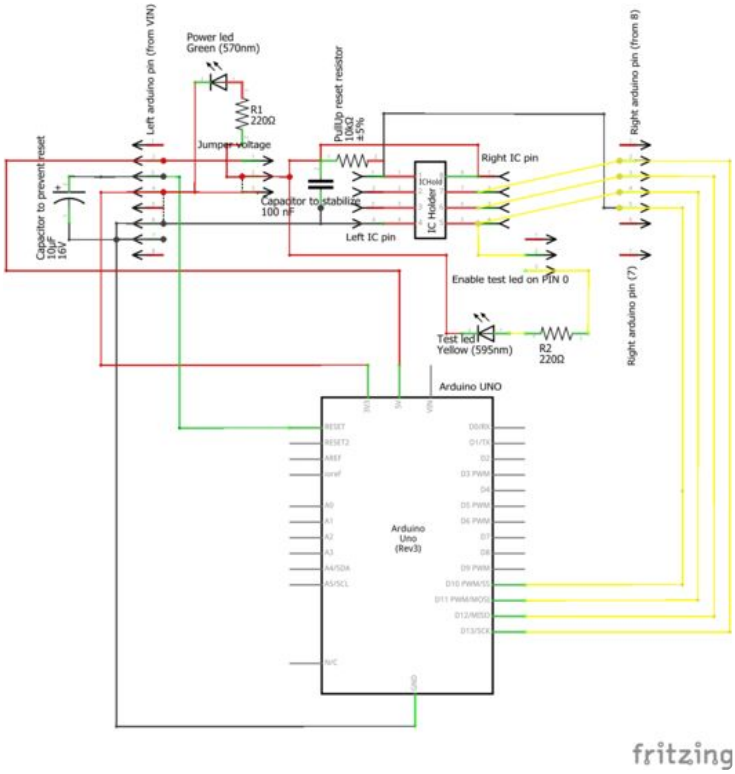
I really like the ATtiny and programming it, so I built a simple board to use Arduino UNO as ISP in a faster way.

With the original Arduino UNO, there is a little variant because compatible one have another 5v VCC over RESET pin, Arduino UNO has IOREF instead, but don't worry look at the schema to make the simple change.



Step 1: Schema

In github project you can find the fritzing file with simple examples and schema.



Step 2: Material

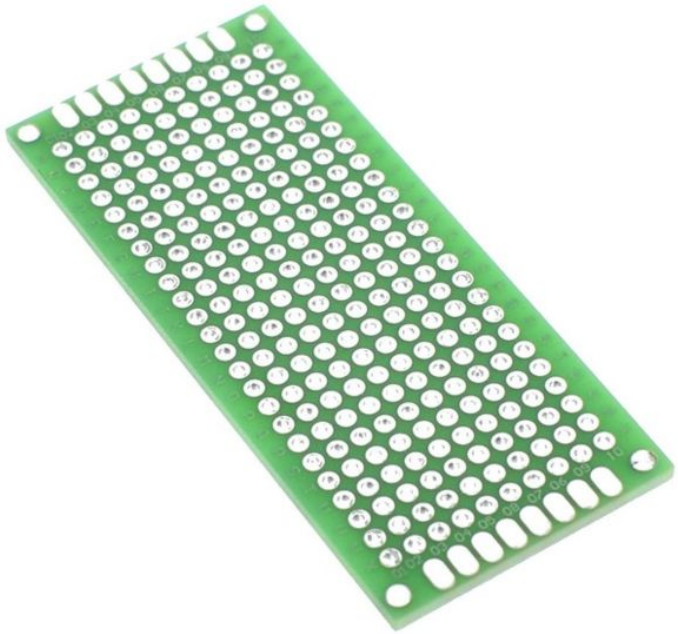
I use a perfored board.

To switch Voltage (to use 3.3v or 5v) and to enable test LED, I use a smd on/off button instead of a pin with a jumper.

The board is double sided so I can attach pin and components up and down the board.

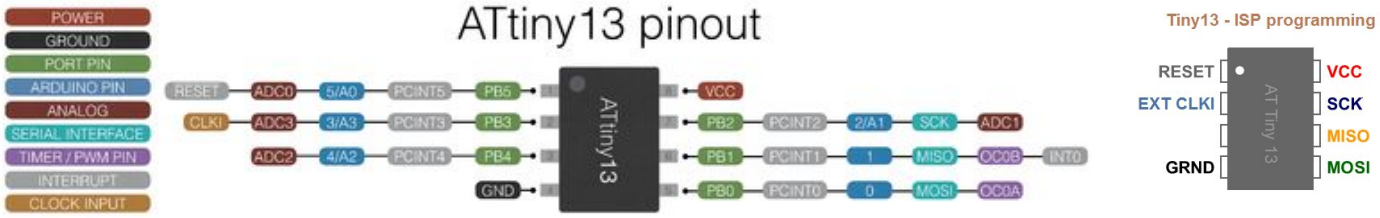
AmountPart TypeProperties

- 1 **Arduino Uno (Rev3)** tipo Arduino UNO (Rev3)
- 1 **Electrolytic Capacitor** *capacitance 10µF*
- 1 **Ceramic Capacitor***capacitance 100 nF*
- 1 **IC Holder***pin spacing 300mil; pins 8*
- 1 **Green LED** *package 3 mm [THT]; colore Green (570nm); leg yes*
- 1 **Yellow LED** *package 3 mm [THT]; colore Yellow (595nm); leg yes*
- 1 **10k■ Resistor***resistenza 10k■ ; tolerance ±5%*
- 2 **220■ Resistor***resistenza 220■ ; tolerance ±5%*
- **Generic male header** *package THT; form (male); hole size 1.0mm,0.508mm; pin spacing 0.1in (2.54mm); pins 8; row single*
- **Generic female header***package THT; form (female); hole size 1.0mm,0.508mm; pin spacing 0.1in (2.54mm); pins 4; row single*



Step 3: ATtiny13a Variant

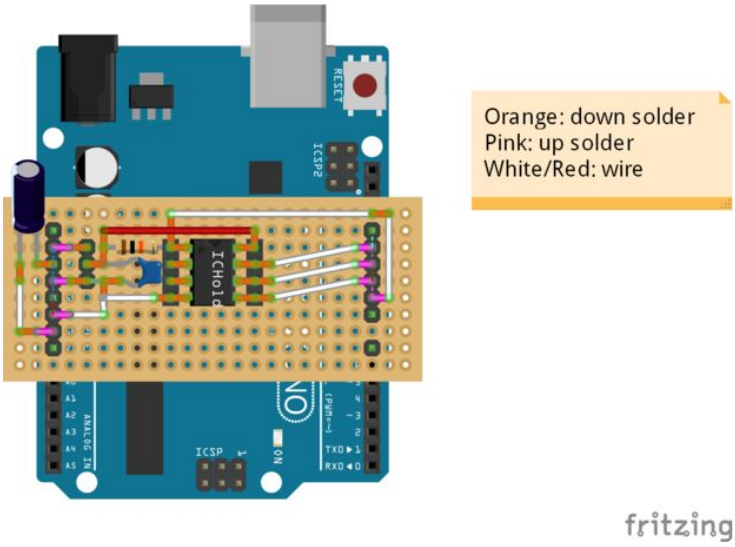
I buy ATtiny13a very low cost IC (less than 0.5€), with 4 analog pin and 2 PWM/TIMER PIN.



Step 4: Board V01

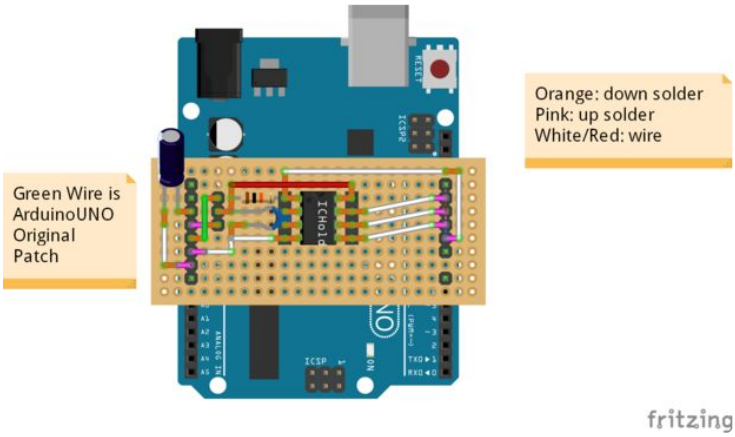
First version of board with no led indicators.

This version work only with fake Arduino.



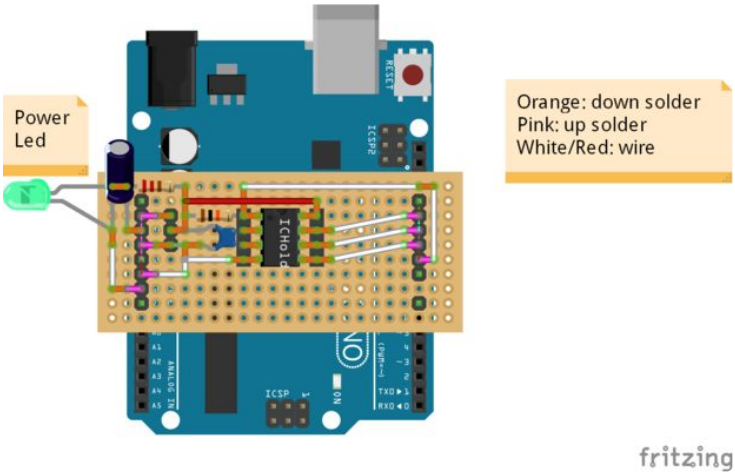
Step 5: Board V01 (Original ArduinoUNO)

As you can see for Original Arduino uno you must add a wire to give 5v voltage to switch.



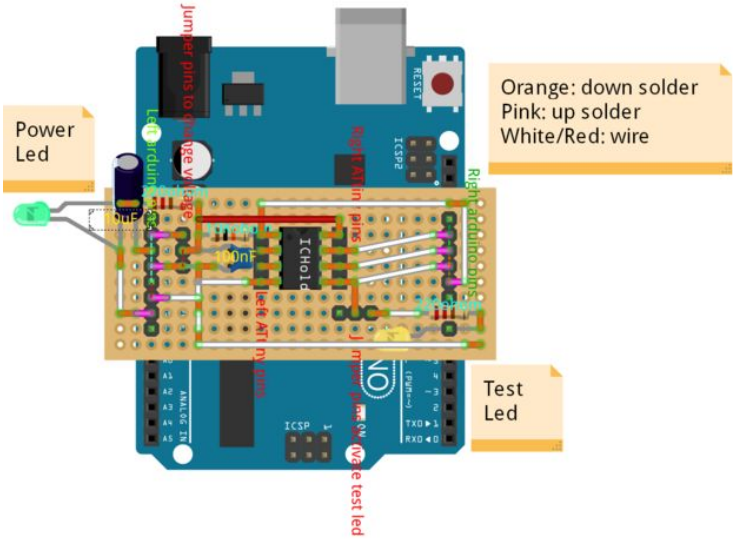
Step 6: Board V02 (power Led)

Add green led to control if board have power supply.



Step 7: Board V03 (test Led)

I add a very usefully test led, to check if all is connected correctly.



Step 8: Board: Voltage Jumper

ATtiny can work at various voltage so I insert a jumper to select ATtiny operating voltage 3v or 5v power supply.

Picture of Board: Voltage Jumper

Step 9: Board: Test Led Jumper

To test if It's all ok on board I add a test led that can be activated by that jumper.

Picture of Board: Test Led Jumper

Step 10: Board: Reset Capacitor

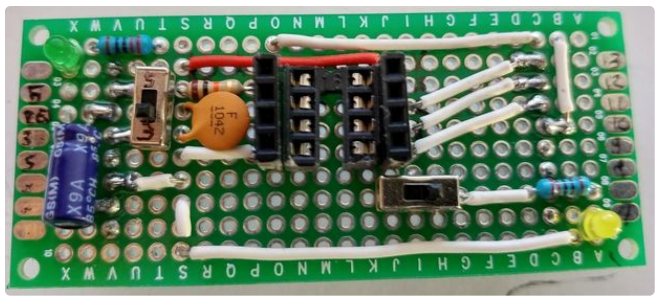
To prevent reset when upload code It's important to add a capacitor to reset pin of Arduino.

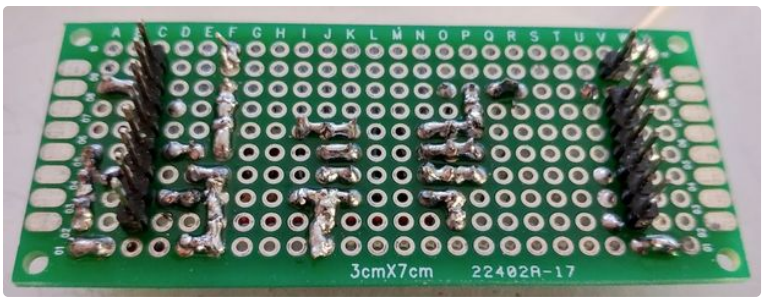
Step 11: Board: Voltage Capacitor and Reset Resistor

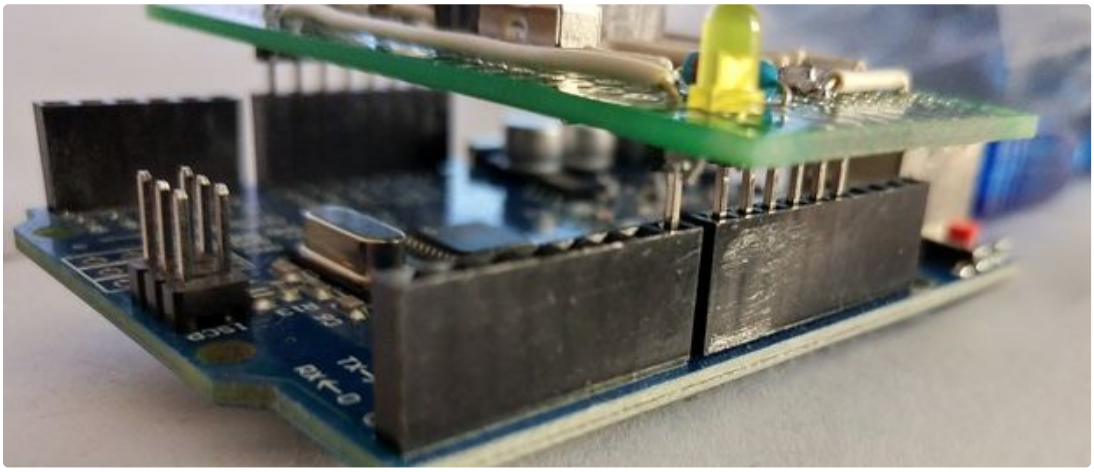
Other important think is the capacitor to stabilize the voltage and pullup resistor to reset pin of ATtiny.

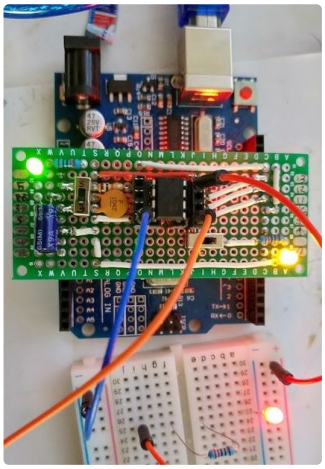
Step 12: Assembled Board

The realization is quite simple and the result is very usefully.









Step 13: How to Program an ATtiny: Prepare ArduinoUNO to Use It As ISP

1. In Arduino IDE select ArduinoUNO board (*Tool --> Board --> ArduinoUNO - Strumenti --> Scheda --> ArduinoUNO*);
2. Than open ArduinoISP example file (*File --> Examples/Esempi --> 11.ArduinoISP --> ArduinoISP*);
3. Upload Arduino (*Sketch --> Upload/Carica*);
4. Close IDE.

Step 14: Add Support for ATtiny: ATtiny13/ATtiny13a

GitHub ATtiny13 support

1. Open the Arduino IDE;
2. Open the *File > Preferences* menu item;
3. Enter the following URL in Additional Boards Manager URLs: https://mcudude.github.io/MicroCore/package_MCUdu... ;
4. Open the Tools > Board > Boards Manager... menu item;
5. Wait for the platform indexes to finish downloading;
6. Scroll down until you see the MicroCore entry and click on it;
7. Click Install;
8. After installation is complete close the Boards Manager window.

Step 15: Add Support for ATtiny: ATtiny25/ATtiny45/ATtiny85

GitHub other ATtiny support

1. Open the Arduino IDE;
2. Open the File > Preferences menu item;
3. Enter the following URL in Additional Boards Manager URLs: https://raw.githubusercontent.com/damellis/attiny... ;
4. Open the Tools > Board > Boards Manager... menu item;
5. Wait for the platform indexes to finish downloading;
6. Scroll down until you see the MicroCore entry and click on it;
7. Click Install;
8. After installation is complete close the Boards Manager window.

Step 16: How to Program an ATtiny: Upload to ATtiny

1. Attach board to ArduinoUNO;
2. Insert ATtinyXX;
3. If the board is v03 than activate test led otherwise using a breadboard and take VCC from upper right pin of attiny and GND to down left pin, than connect 0 pin (down right) to a led;
4. Select board with correct setting and PORT (*Tools --> Board/Strumenti --> Scheda*);
5. Select Arduino as ISP (*Tools --> Programmer --> Arduino as ISP/Strumenti --> Programmatore --> Arduino as ISP*);note: Arduino as ISP is different from ArduinoISP.
6. Upload program (*Sketch --> Upload from programmer / Schetch --> Carica tramite un programmatore*).

Step 17: Sample Sketch

A simple scketch to upload to ATtiny

```
#define PIN 0
void setup()
{
  pinMode(PIN, OUTPUT);
}

void loop()
{
  digitalWrite(PIN, LOW);
  delay(500);
  digitalWrite(PIN, HIGH);
  delay(500);
}
```

Step 18: Thanks

In github project you can find some additional info and schema.