

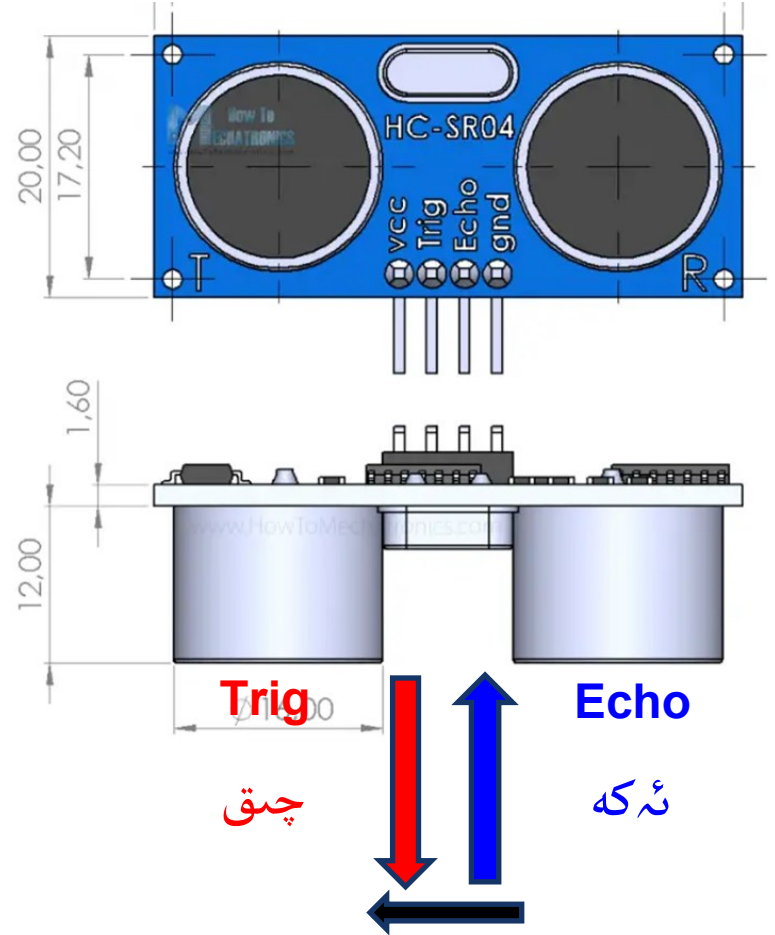


مەشگۈتەك ئىككىنچى سىنىپ

تۆتىنچى دەرس

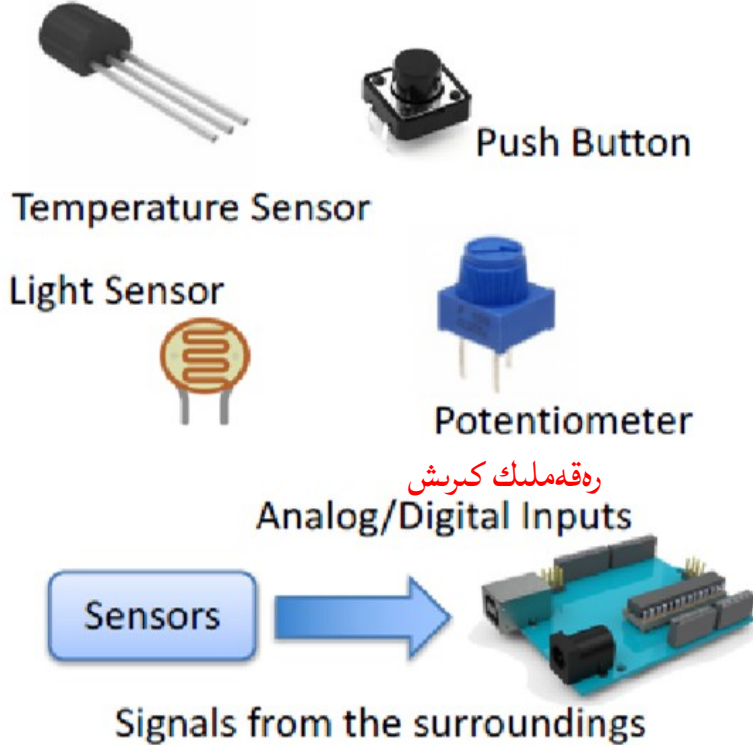
دوكتور مەمەتجان ياسىن

3-02-2024



سەزگۈچ ۋە قوزغاتقۇچ (Sensors & Actuators)

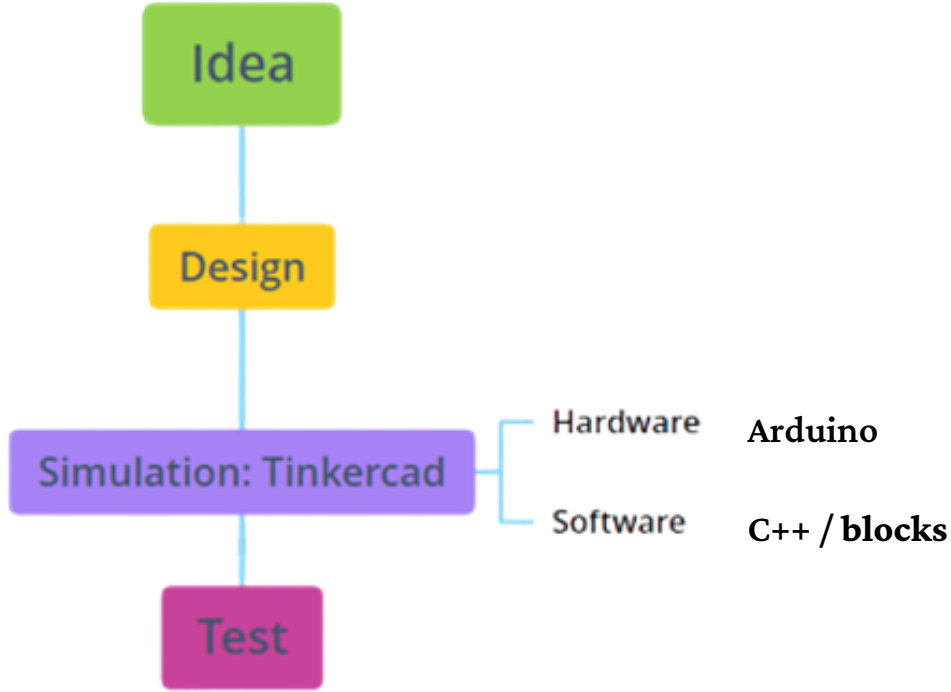
<http://www.mengutech.com/table/>



دەرس قۇرۇلمىسى structure

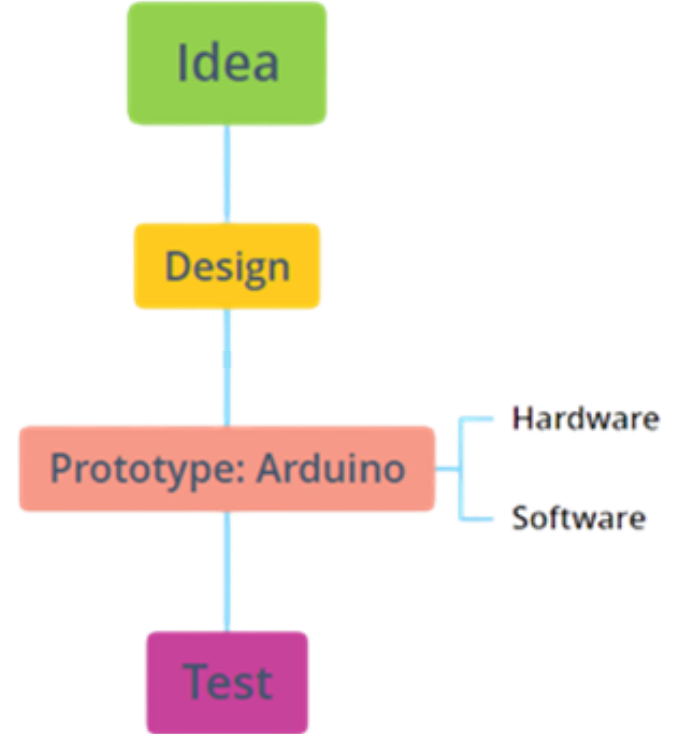
Simulation

تەقلىد قىلىش



hardware implementation

قاتتىق دېتالدا يۈرگۈزۈش

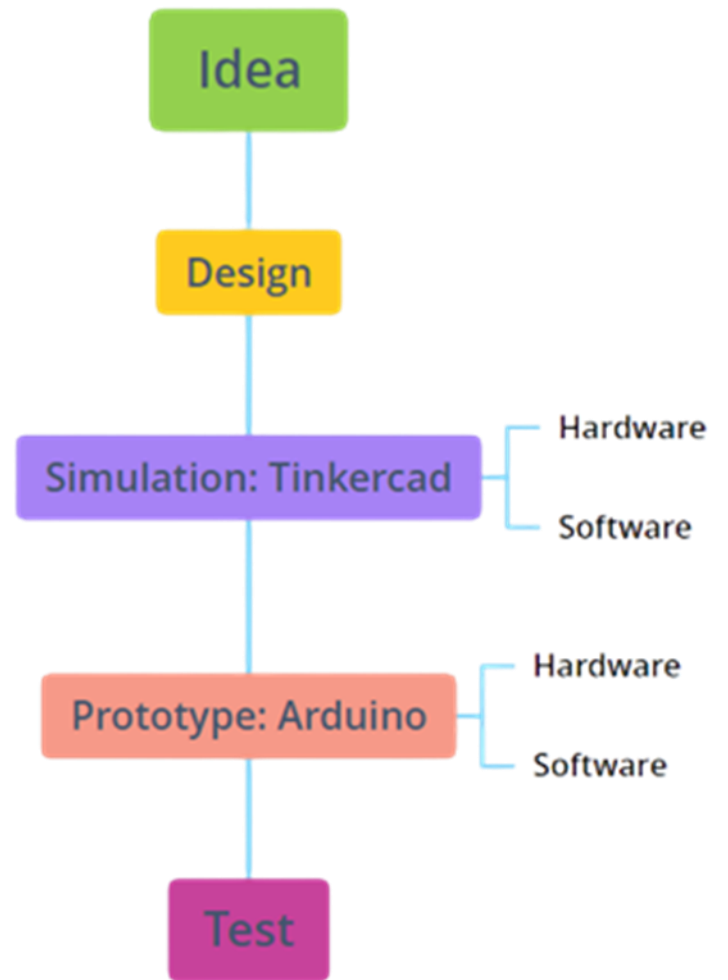


Integration

بىرلەشتۈرۈش

Idea to prototype

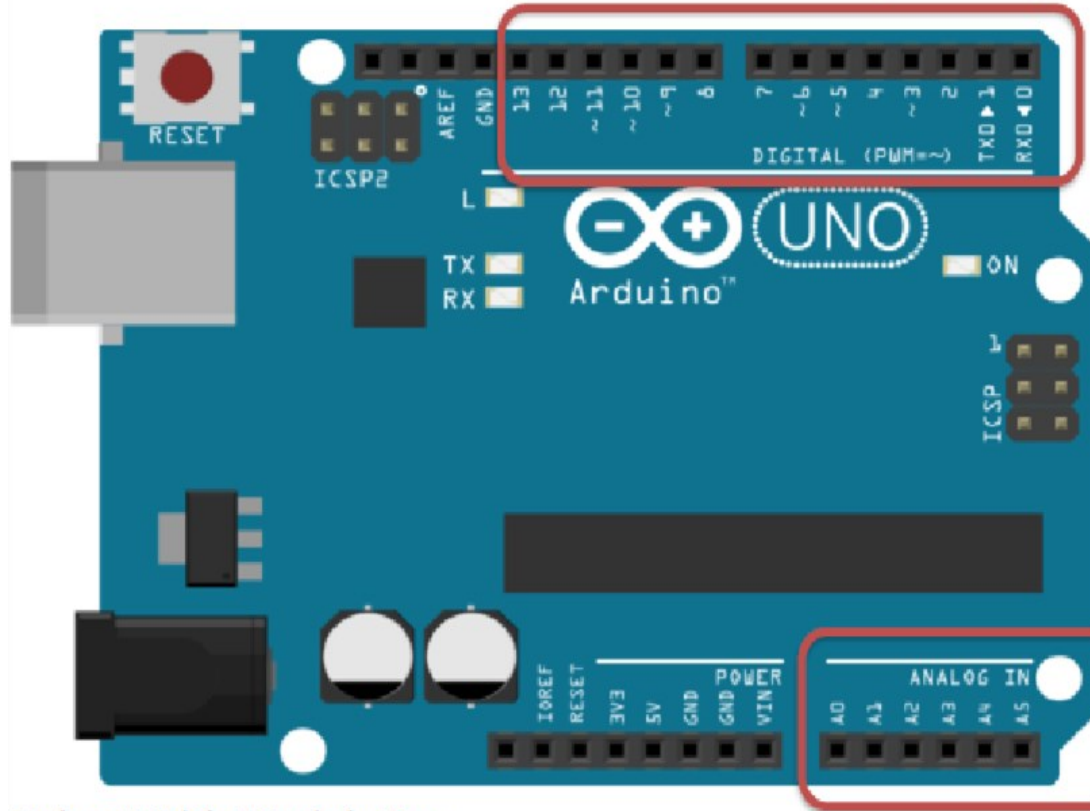
ئىدىيەدىن پروتوتىپقىچە



(Digital Input) رەقەملىك كىرىش

رەقەملىك كىرىش ۋە چىقىش

Digital Inputs and Digital Output



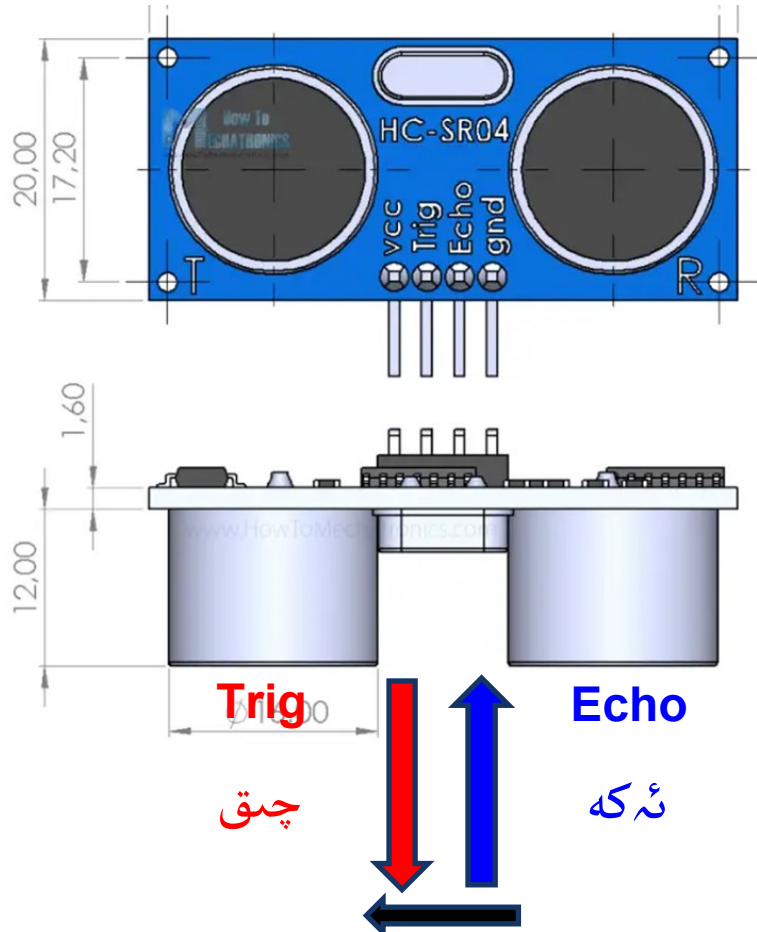
You can choose from the code if they are to be inputs or outputs

Those marked with ~ can also be used as "Analog Outputs", so-called PWM outputs

Analog Inputs

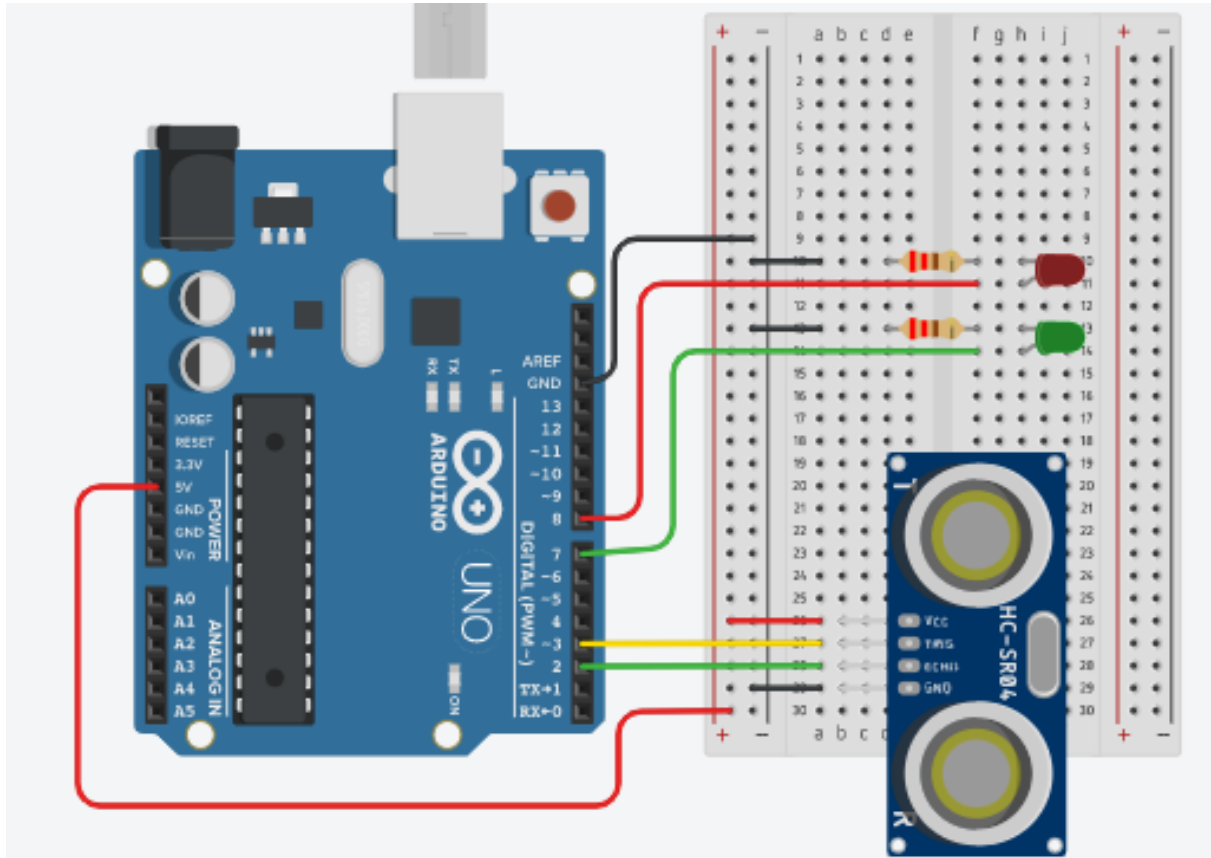
Pulse Width Modulation

Ultrasonic sensor - how does it work?



ئۇلترا ئاۋازلىق سەزگۈچ

2- ئەقلىق ماشىنا توختىتىش ياردەمچى مسالى



ئەقلىلىق ماشىنا توختىتىش ياردەمچى مسالى - 2

```
forever loop:  
  set arliq to read ultrasonic distance sensor on trigger pin 3 echo pin 2 in units cm  
  if arliq < 50 then  
    set pin 8 to HIGH  
    set pin 7 to LOW  
  else  
    set pin 8 to LOW  
    set pin 7 to HIGH
```

The image shows a Scratch code block for a microcontroller. It starts with a 'forever' loop. Inside the loop, there is a 'set' block that reads the ultrasonic distance sensor on trigger pin 3 and echo pin 2, with units set to cm. This value is stored in a variable named 'arliq'. Below this is an 'if' block that checks if 'arliq' is less than 50. If true, it sets pin 8 to HIGH and pin 7 to LOW. If false, it sets pin 8 to LOW and pin 7 to HIGH.

Artificial Intelligence Driving

سۈنئىي ئىدراك

ماشىنا ھەيدەش

Speed	سۈرئەت
Space	ئارلىق
Sign	بەلگە
Stop	توختاش
Slow down	ئاستىلىتىش
Signal	سىگنال بېرىش
Squeeze in, not cut in during lane changes	يول بويلاپ يول ئۆزگەرتىش
Salam	
See	كۆرۈش
Safe driving (defensive driving)	بىخەتەر ماشىنا ھەيدەش
Safety skills	بىخەتەرلىك ماھارەت

تۈگىدى

