CSE Fest 2016 Workshop

Let's Make Robot

Outline

- We will write code for a basic robot
- Our robot will detect obstacle and avoid it
- Basic knowledge of C/C++, Digital Logic, Electronics

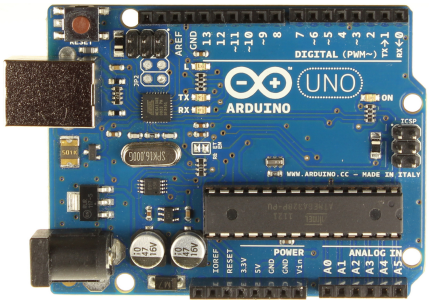
Hardware

- Arduino Uno Board : Brain of our Robot.
- HC-SR04: Ultrasonic Sensor. To Detect Obstacles
- Geared DC Motor.
- LiPo Battery
- L298 Breakout Board

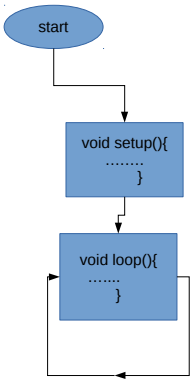
Software

- Arduino IDE.
- Language: Processing. C/C++ like

Arduino Uno Basic



Program Structure



- Data type just like C
- Syntax almost C

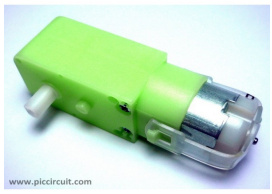
Some Basic Functions

- PinMode(Pin#, INPUT or, OUTPUT)
- digitalRead(Pin#) return 1 or, 0
- digitalWrite(Pin#, HIGH or, LOW)
- analogRead(Pin#) returns unsigned 10 bit integer..i.e. 0 → 1023
- analogWrite(Pin#, value). Value can be an unsigned 8 bit integer.. i.e. 0 → 255

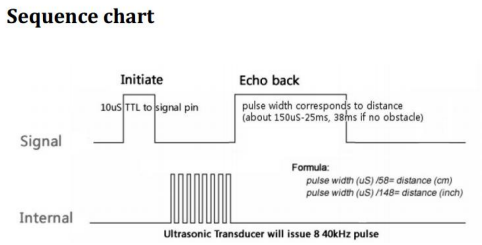
Let's Flash First Code

- Blink
- delay....

Geared Motor

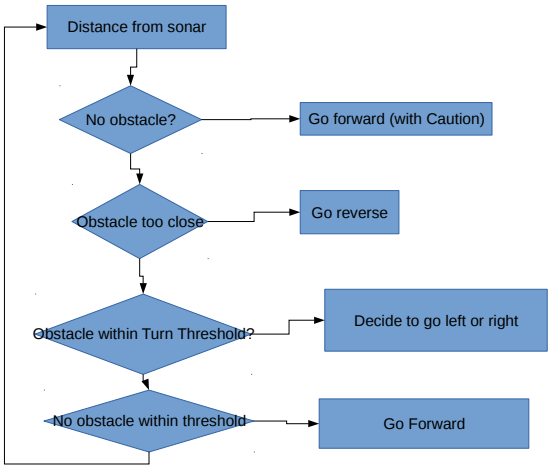


Sonar



Before we get code for brain

- Connect the motors
- Run a motor
- Brake a motor
- Go straight
- Pivot left
- Pivot Right
- Go Reverse
- Read Sonar



- Lets inspect how are we deciding to go left or right?

Concluding Thoughts

- Add a better way to scan horizon
- Make the robot aware of its movement
- Why robot won't go straight?
- Power management
- More sensors
- Smooth movement