ALGORITHM - WORKING PRINCIPLE

The sonar system is used in HC-SR04 ultrasonic sensor to determine distance to an object like bats do. It offers excellent non-contact range detection from about 2 cm to 400 cm or 1'' to 13 feet. Its operation is not affected by sunlight or black material.

The ultrasonic sensor emits the short and high frequency signal. If they detect any object, then they reflect back echo signal which taken as input to the sensor through Echo pin.

Firstly, we initialize Trigger and Echo pin as low and push the robot in forward direction. when obstacle is detected Echo pin will give input as high to micro- controller. pulse In() function is used for calculating the time of distance from the obstacle. Every time the function waits for pin to go high and starts timing, then timing will be stopped when pin go to low. It returns the pulse length in microseconds or when complete pulse was not received within the timeout it returns 0.

The timing has been determined means it gives length of the pulse and will show errors in shorter pulses. Pulses from 10microseconds to 3 minutes in length are taken into consideration.

After determining the time, it converts into a distance. If the distance of object is moderate then speed of robot gets reduced and will take left turn, if obstacle is present in left side then it will take right turn.