Keep Away

Time required: 60 minutes

Please read all the directions carefully before beginning the assignment.

- Comment your code as shown in the tutorials and other code examples.
- Follow all directions carefully and accurately.
- Think of the directions as minimum requirements.

Understanding

Demonstrate understanding of:

Ultrasonic sensor, relational operators

Knowledge Points

An ultrasonic sensor can detect the distance from the object in front of it. A critical value is the distance between the object in front and mBot's ultrasonic sensor can be defined as the threshold to determine whether mBot should move forward (a threshold is a value of the condition under which an object is changed, which is also called critical value).

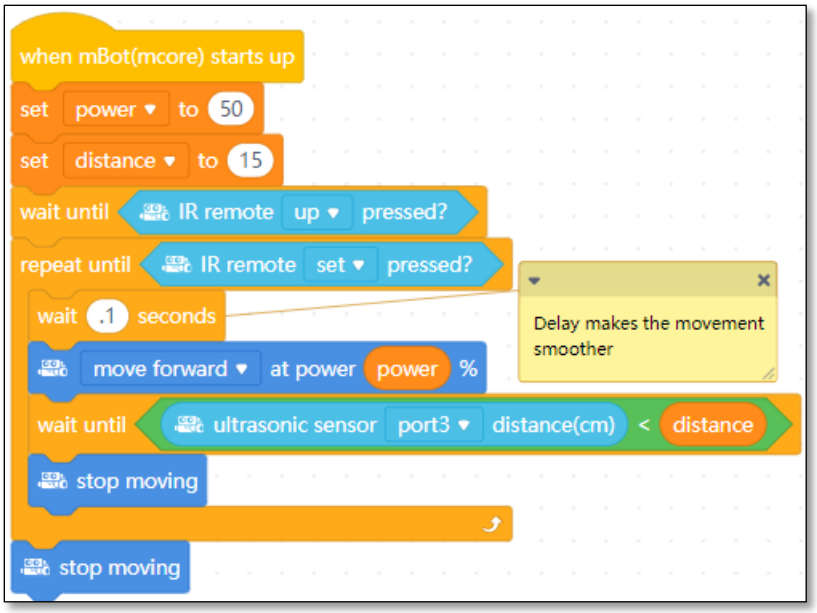
While Loop

A while loop is similar to the repeat until block. This loop keeps going until a condition is met. In the example program, the keep away part of the program will continue to repeat until the set button is pressed. The program exits the loop. The mBot stops moving.

In this example the value of the ultrasonic sensor indicates the distance between mBot and the object in front of it. Given the threshold of 15cm, mBot will keep moving forward until its distance from the object is less than 15cm; the mBot will stop immediately when its distance from the object is less than 15cm.

Tutorial Assignment

1. Open the Arduino IDE. Save the sketch as **KeepAway**
2. Complete and test the program. Use the mBlock as an example to get started.



Requirements

- The robot detects an object within 15 cm and stops.
- When the object is moved, the mBot starts moving forward.
- Test the keep away with your foot.

Challenge

- Add lights when an object is detected.
- Add a sound when an object is detected. Make it very short. You will want to replace the wait with the sound.

Extra Credit Challenge

Can you make the robot also move backwards if the barrier is moved closer to the mBot?

Assignment Submission

- All students attach the finished program to the assignment in Blackboard.
- Each assignment can be demonstrated in class.
- For online students, a link to a YouTube video recording showing the assignment can be placed in the submission area in BlackBoard.