Keep Away

Time required: 60 minutes

- Keep Away Tutorial Video
- Keep Away Assignment Video
- Keep Away Algorithm (How to solve moving forward and backward)

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).

repeat until Block

The repeat until block is another type of loop. In other programming languages this is called a while loop. This loops 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.

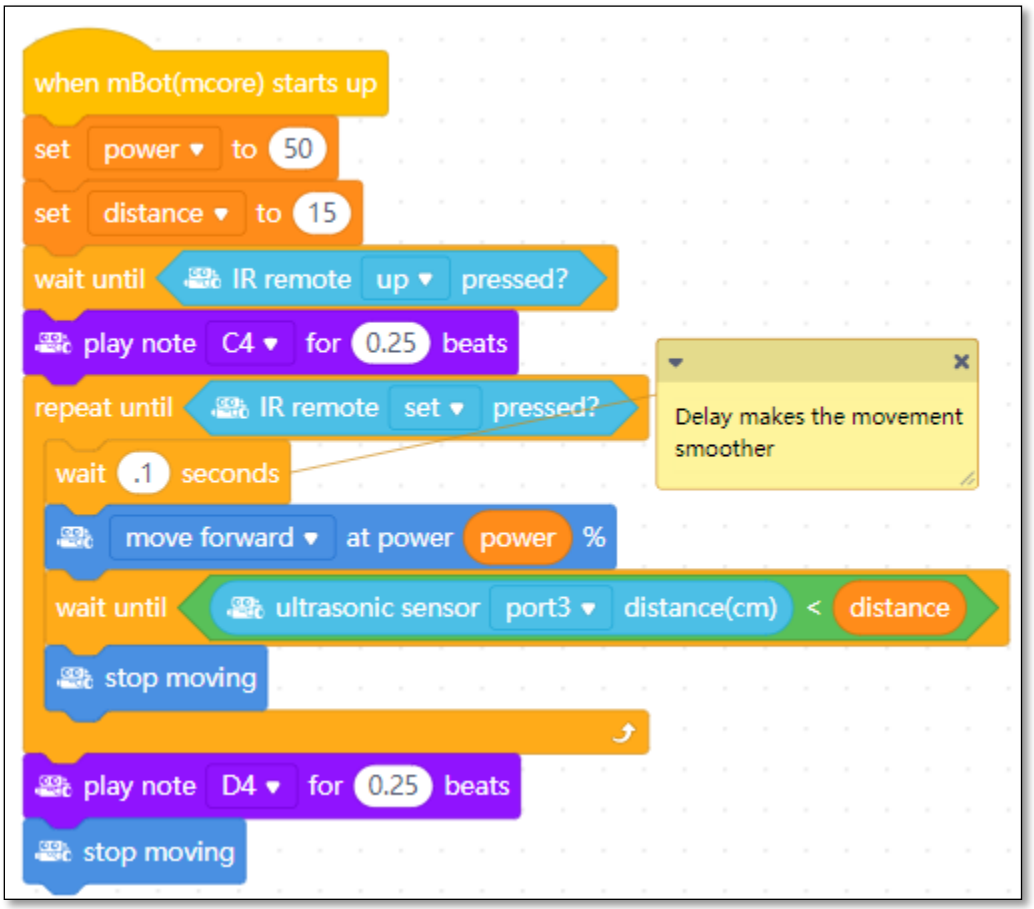
In this example the value of the ultrasonic sensor indicates the distance between mBot and the object in front of it. Given the threshold of 15cm, mBot will keep moving forward until its distance from the object is less than 15cm; the mBot will stop immediately when its distance from the object is less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

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.

Tutorial Assignment

1. Start mBlock. Save the program as **Keep Away**.
2. Complete and test the program as pictured with the requirements listed.



Assignment

Start with your tutorial project and add the following.

- 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.
- Make the robot also move backwards if the barrier is moved closer to the mBot.

NOTE: An if else statement will allow your robot to go two different directions based on the distance detected. You will want one distance for moving backwards, another distance for moving forward.

Assignment Submission

- **All students** → Attach finished programs to the assignment in Blackboard.
- **In class assignment submission** → Demonstrate in person.
- **Online submission** → A link to a YouTube video recording showing the assignment placed in the submission area in BlackBoard.