Simple Movement

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.

Description

The program we build in this assignment moves the mBot in four directions at a predetermined speed. The movement blocks, **move forward**, **move backward**, **turn left**, and **turn right** can be set from 0 to 100 percent. Don't set the speed below 30 percent or the motor will stall. 50% will be the power setting we will typically use in our programs.

Understanding

Demonstrate understanding of:

wait until, repeat and loops

Knowledge Points

wait until

This block waits until an event happens, in this case, pressing the ir remote up arrow button.

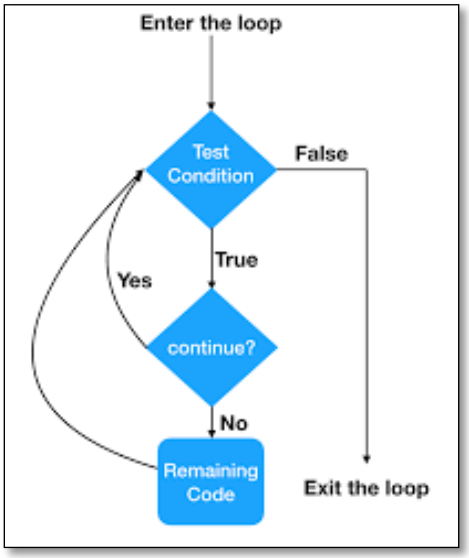
repeat

The repeat block repeats the code inside the block the listed number of times, in this case, 4 times. This simulates mBot waggling.

Repeats are Loops

The repeat block in mBlock is a repetition structure. It is called a loop in most programming languages. This type of loop executes a set number of times, then exits and moves on to the next step.

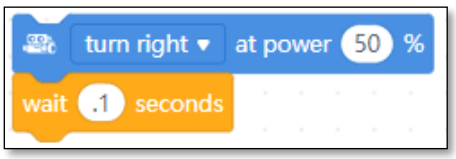
The loop starts at 1 the first time through the loop. Each time the number is incremented, next to 2, then 3, etc., until the test condition returns false. In the example program, when the loop gets to 5, the test condition is false, the program exits the loop and moves on.



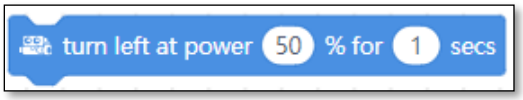
Time Duration for Movement

For the robot to move, there must be a time duration for the wheels to turn. The motors move like this.

1. Electrical control pulse is sent to the motors.
2. The motor starts moving.
3. Time duration must be set for the motor to move. Each of these control blocks have a time duration.
    1. **Wait** .1 seconds will let the motor turn for .1 second.

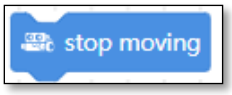


    2. **Turn left at power** for so many seconds. This block has wait built into it.



3. **Play note**. A note has time duration. One beat is a second. .25 beats is .25 seconds.

4. **Stop moving** sends an electrical control pulse to stop the motors.

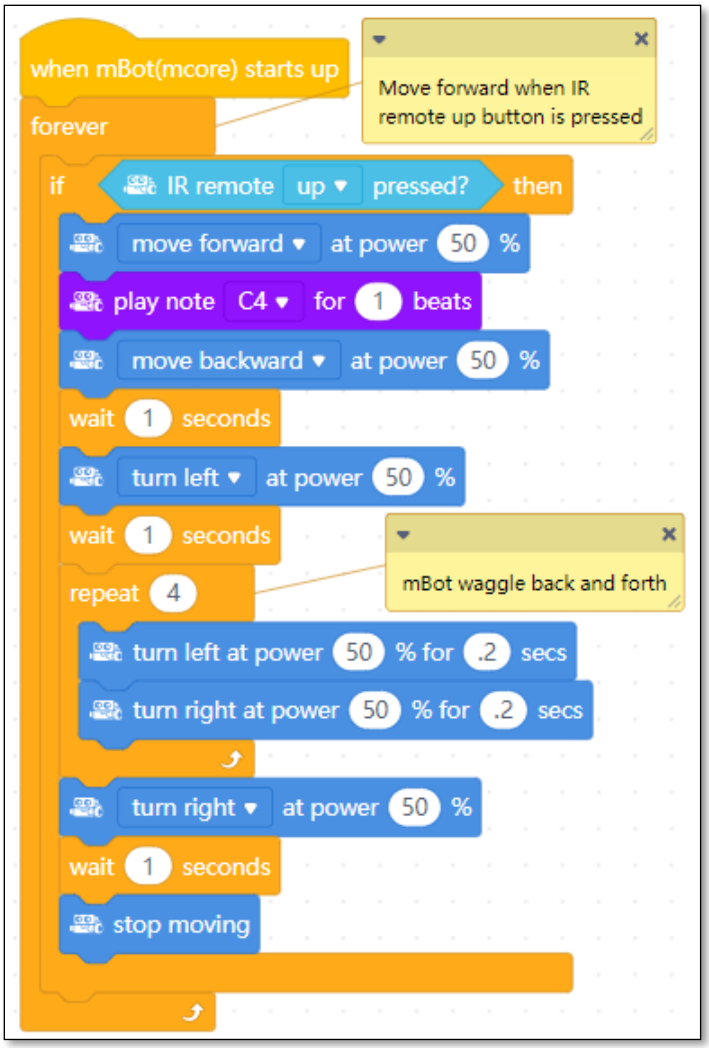


Requirements

The mBot will wait until the up arrow on the remote is pressed, then run through the programmed motions and stop.

Tutorial

1. Start mBlock. Save the program as **Simple Movement**.
2. Create and test the program as shown.



Assignment

Start with your tutorial project and add the following.

- Change the movements to create your own version of the program.
- Change the wait times.
- Make up your own challenge.

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.