Get Started with mBlock

Time required: 60 minutes

mBlock is an open-source development environment for Windows and Mac. It is based on MIT's Scratch graphical programming environment. A block-based programming language is an easy way to learn the basic concepts of programming. There are two ways to use the mBlock programming language.

Install mBlock Application

1. Go to https://www.mblock.cc/en/download
2. Download and install **mBlock 5**. Accept all default choices. Install the driver when prompted.
3. Run **mBlock**.
4. Select the **Devices** tab → Click the **x** on the **Codey** icon → Delete it.
5. Click **Add** → add **mBot**.

mBlock IDE on the Web

Google Chrome is recommended for mBlock on the web. The web version is almost identical to the application.

https://ide.mblock.cc/

Blink LED's (First Program)

This first program uses the two LED's toward the front of the robot. This program introduces looping and waiting. Blinking LED's is the traditional Hello World program of an Arduino device.

Knowledge Points

Each block has a different purpose.

forever

The **forever** block causes the program to repeat forever. This is a characteristic of an Arduino microcontroller program. It will keep repeating the loop over and over until powered off.

wait

The **wait** block pauses the program for the specified amount of time. Without the wait block, the LED's would blink so fast you would just see a solid light from the LED's. Remove the wait blocks and see what happens.

LED

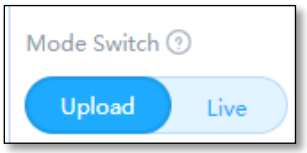
The LED's on the mBot correspond to the standard RGB colors used on the web and other electronic formats. The values range from 0-255.

Requirements

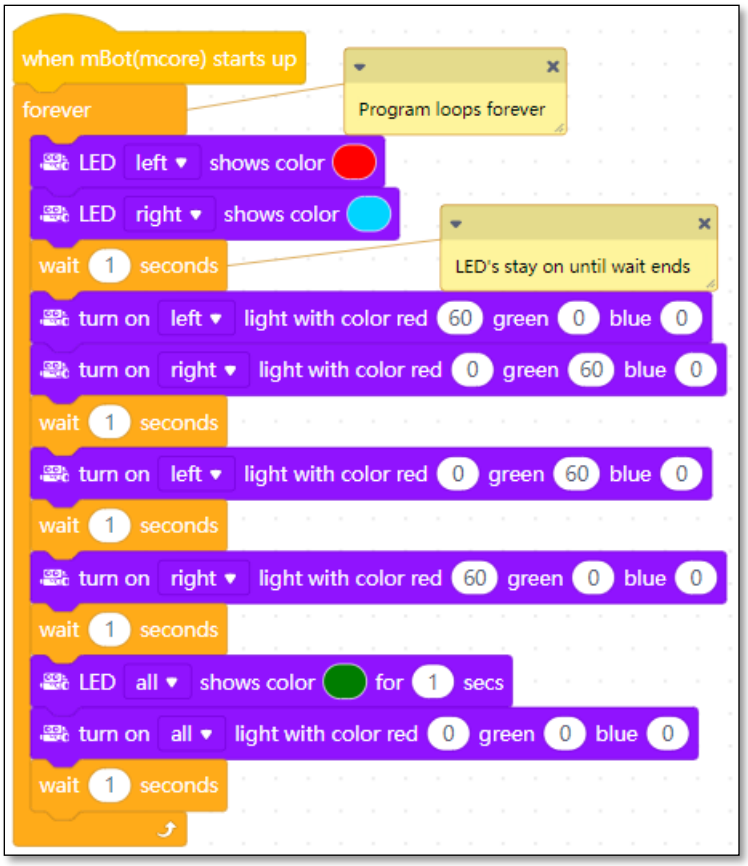
- Program will alternate blinking each LED.
- The program will run immediately and in a continuous loop.
- Each LED will be on for 1 second

Tutorial Assignment

1. Start **mBlock**.
2. Go to the **File** menu → **Save to your computer**.
3. Name the program **Blink LEDs**.
   NOTE: You can't use punctuation in an mBlock file name.
4. Under Mode Switch → Click the **Upload** button to place mBlock into programming mode.



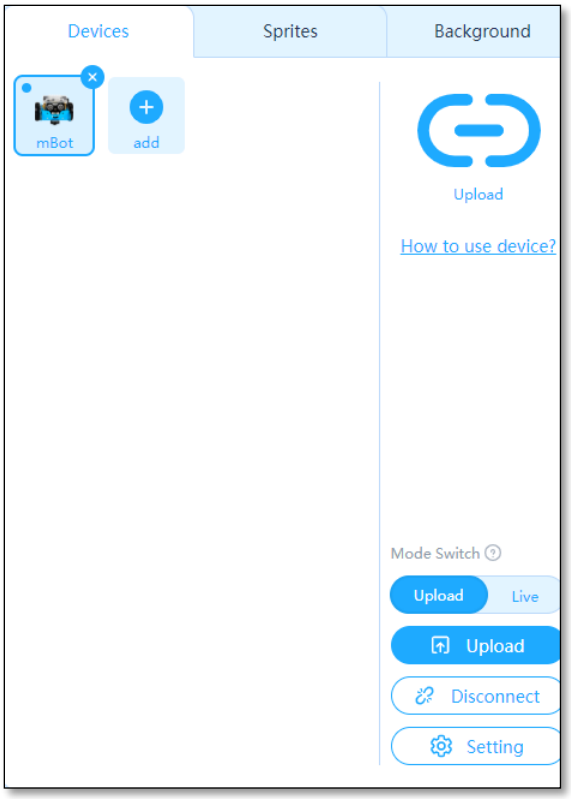
5. Create and test the program as shown.



Upload a Program

1. Connect the robot to a USB port on your computer with the USB cable that came with the mBot.

2. Power on the robot.
3. Select **Connect**. On the USB tab, the correct com port should already be selected. Click **Connect**.
4. Change the **Mode Switch** to **Upload**.
5. Click **Upload**.



Assignment

Add the following to your tutorial project.

- Make up your own colors.
- Change and add wait times.

Check Your Understanding

Please answer the following questions.

1. **What is the purpose of the forever block?**

2. **Remove the wait blocks from the program and run it. What happens?**

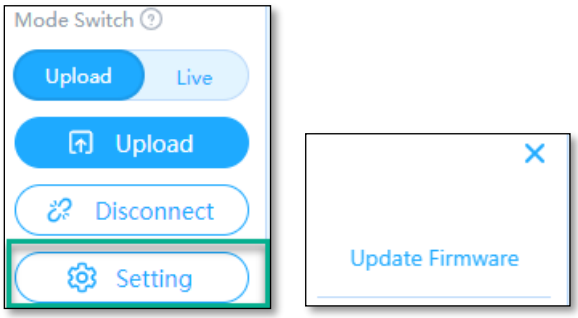
3. **Why does the program set some LED's to 0?**

Factory Default Firmware

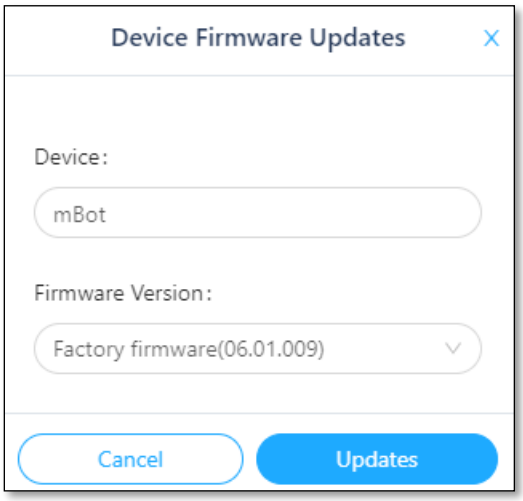
The mBot can only hold one program at a time. You can return your mBot to the original factory software. The following directions show how to upload the factory settings.

1. Connect the robot to a USB port on your computer with the USB cable.
2. Power on the robot.
3. Select **Connect**. On the USB tab, the correct com port should already be selected. Click **Connect**.

4. Change the **Mode Switch** to **Upload**.
5. Click **Setting** → **Update Firmware**



6. Select **Firmware Version** → **Factory firmware**.



7. Click **Updates**.

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.