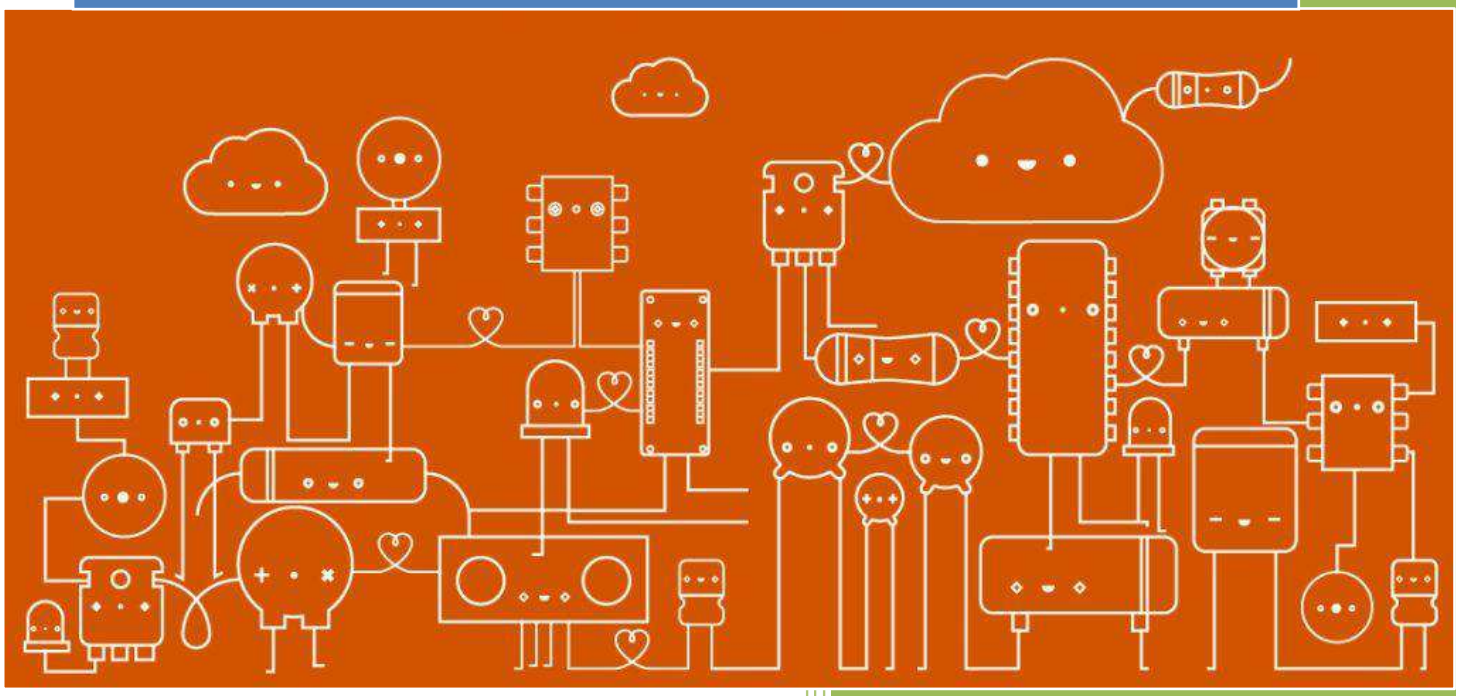
2019

Arduino Starter Kit

Graphical Programming Tutorials



Graphical programming

1- LED Twinkle

You need to follow the steps below to build blocks.

List of components required for the experiment:

Arduino UNO board *1

USB cable *1

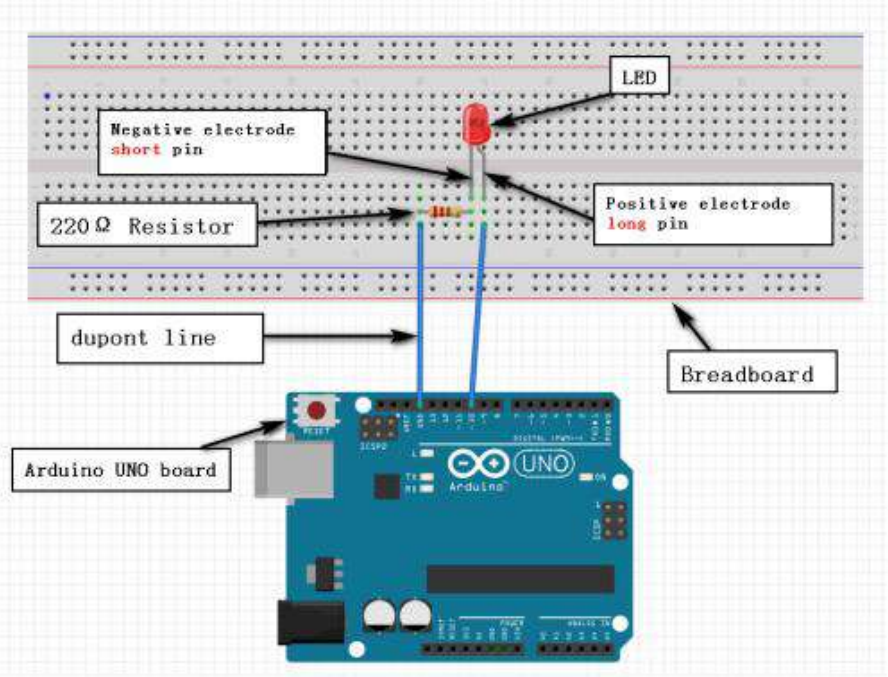
LED*1 (color random)

220Ω resistor *1

Breadboard *1

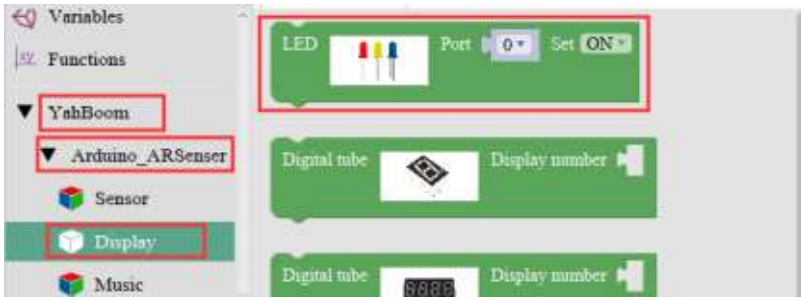
Dupont line *1 bunch

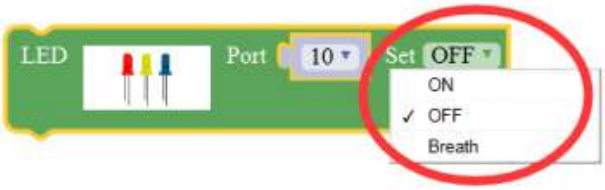
Actual object wiring diagram:

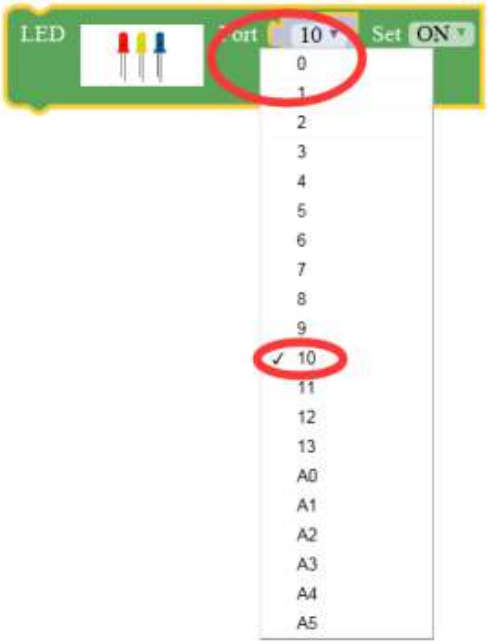


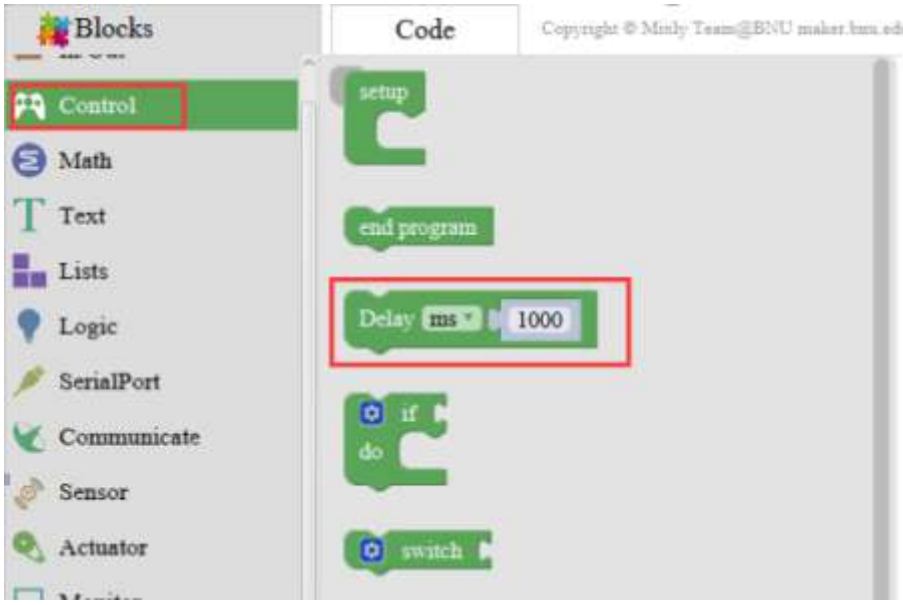
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

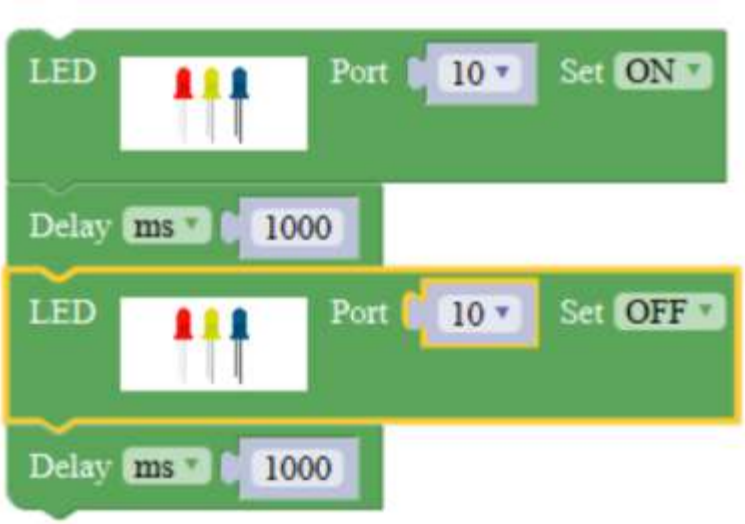






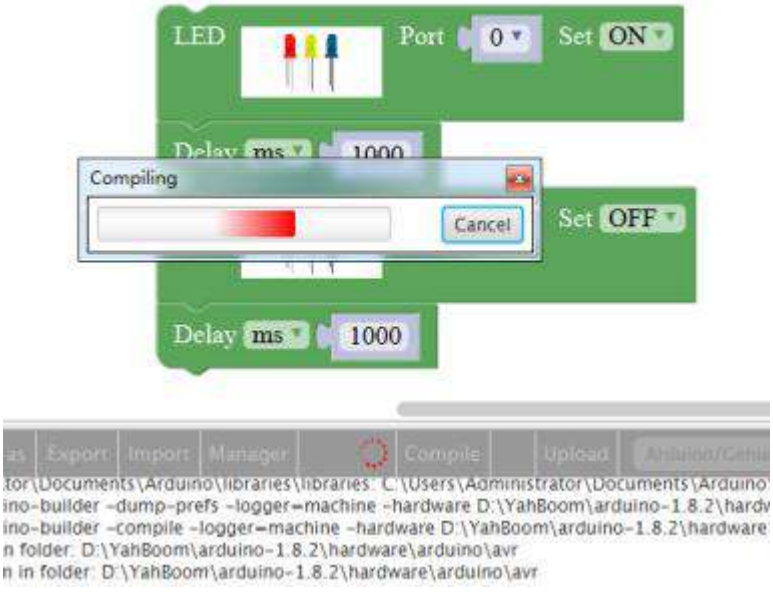


2.You need to combine the selected blocks, as shown in the figure below.

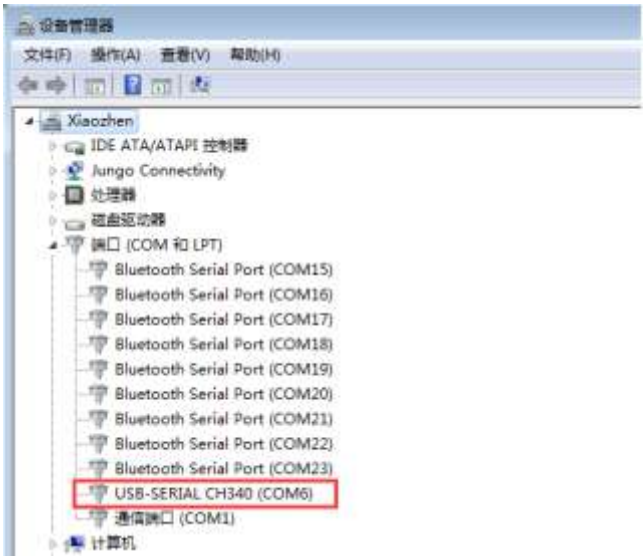


3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

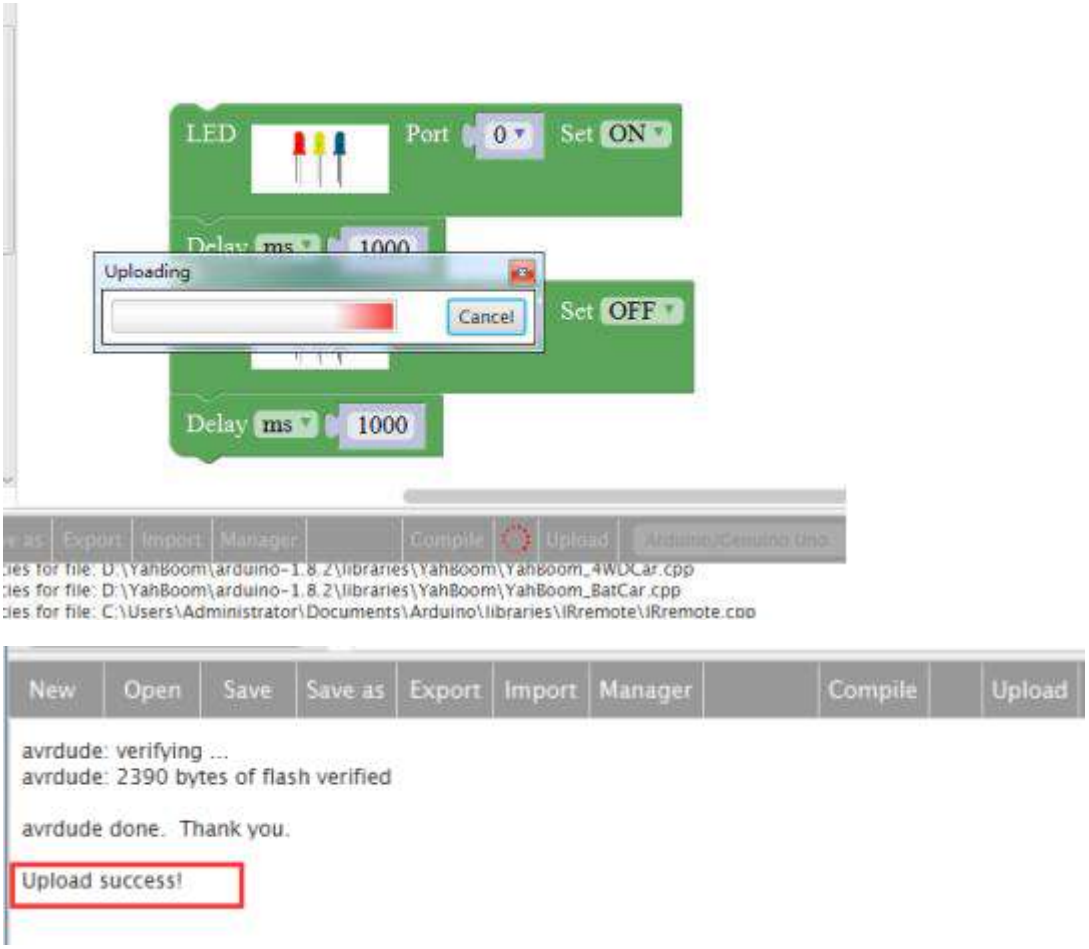
4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.



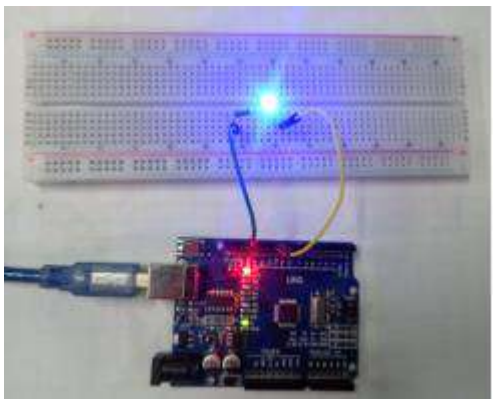
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

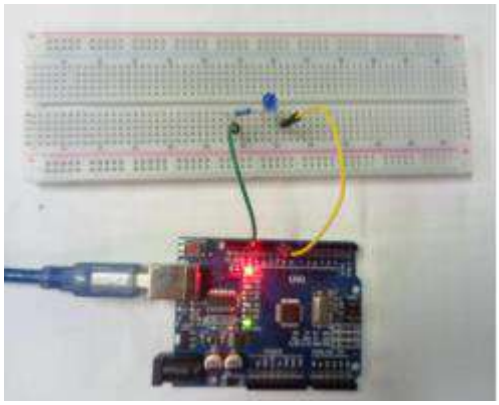


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



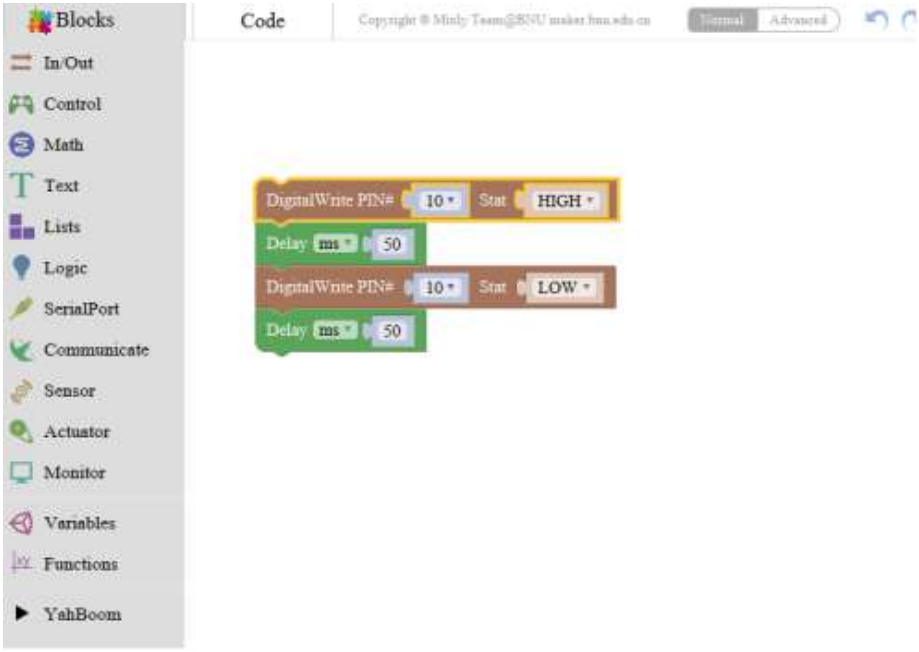
7.After the code is uploaded, we can see LED light twinkle every second, as shown in the picture below.





2- Analog value

You need to follow the steps below to build blocks.



List of component ：

Arduino UNO board *1

USB cable *1

LED*1 (color random)

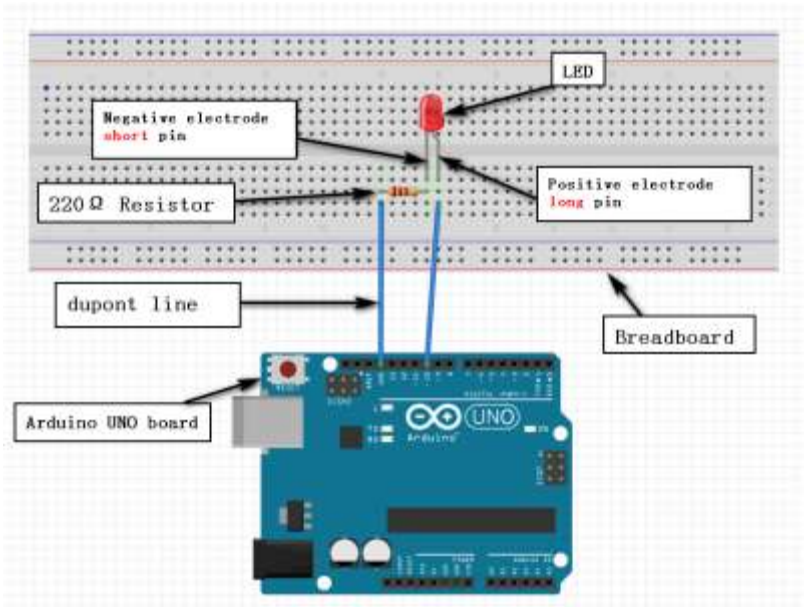
220Ω resistor *1

Breadboard *1

Dupont line *1 bunch

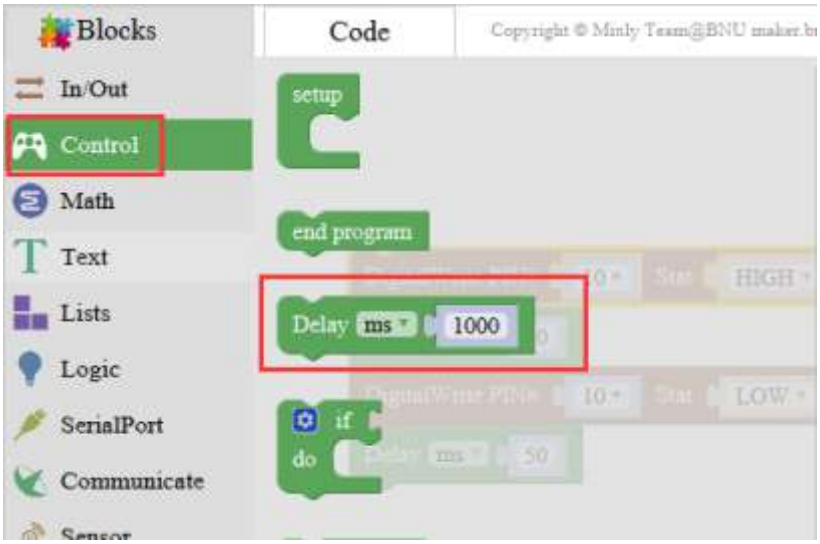
Actual object connection diagram:

We need to connect the circuit as shown in the figure below.

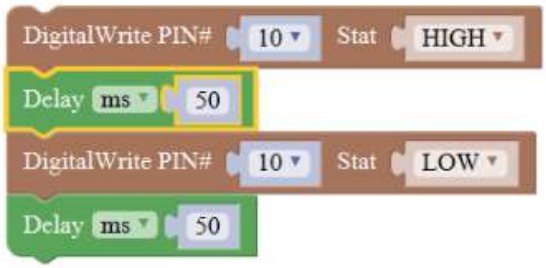


Steps of experiment:

1. You need to choose the building blocks which you need for this experiment, as shown in the figure below.

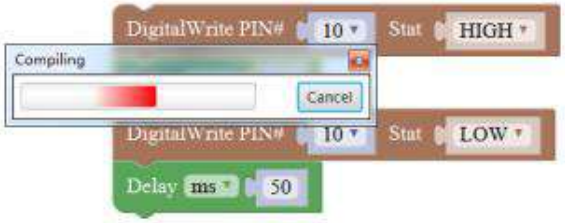


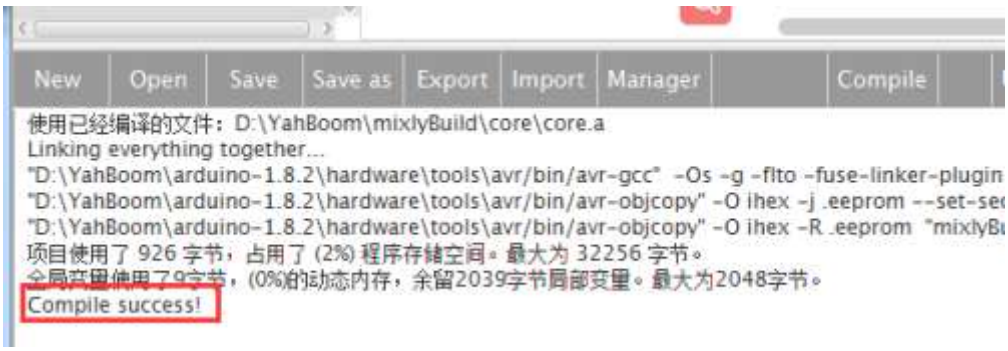
2.You need to combine the selected blocks, as shown in the figure below.



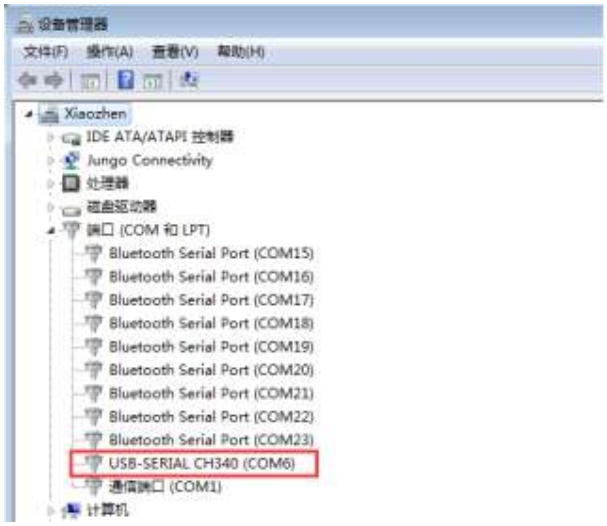
3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

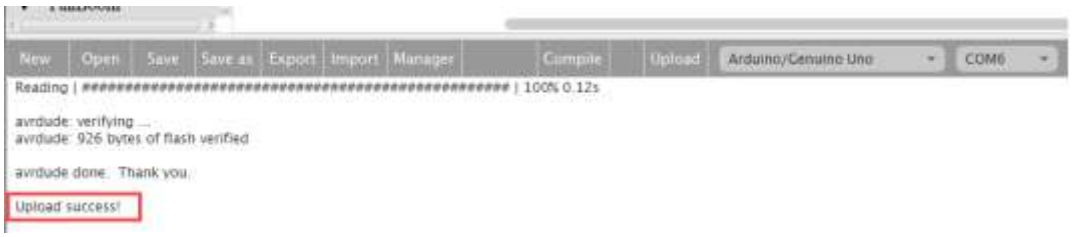




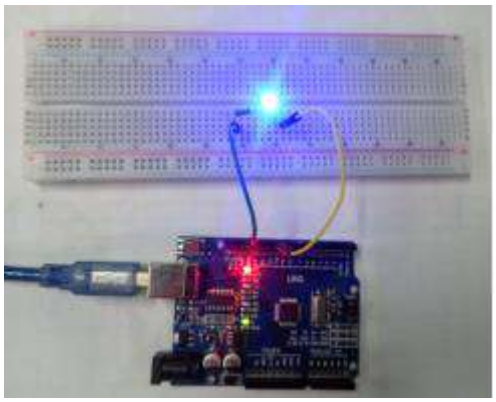
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

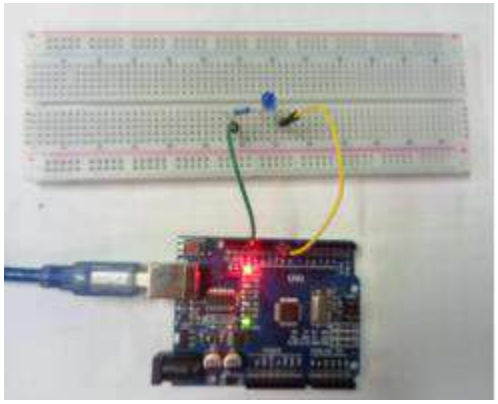


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



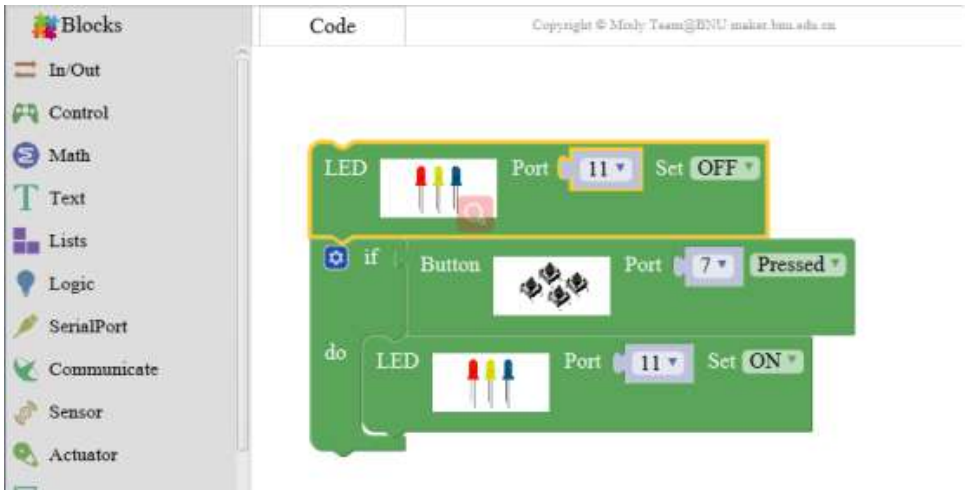
7. After the code is uploaded, we can see LED light twinkle at intervals of 0.05 seconds, as shown in the picture below.





3- Key light

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

LED*1（Color random）

220Ω Resistor *1

10kΩ Resistor *1

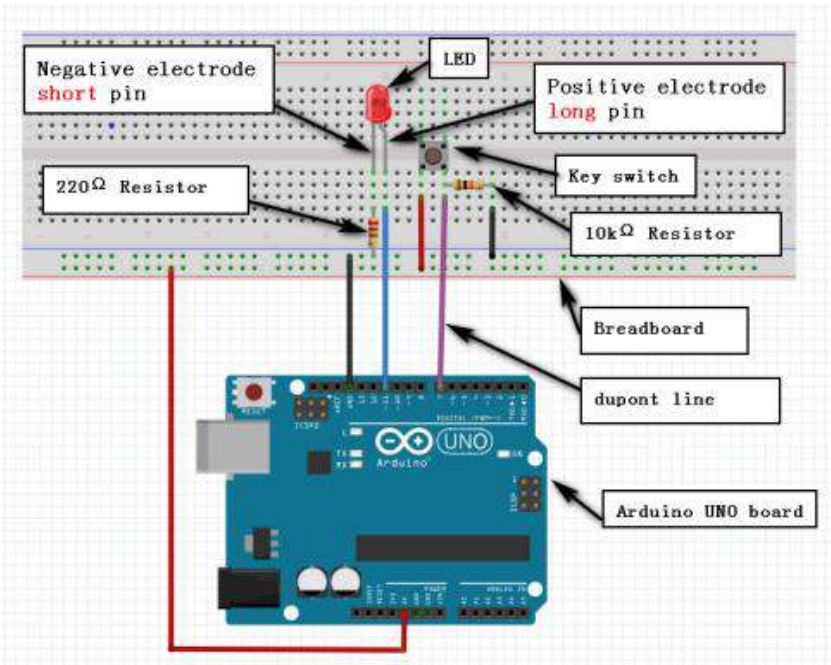
Key switch *1

Breadboard *1

Dupont line *1 bunch

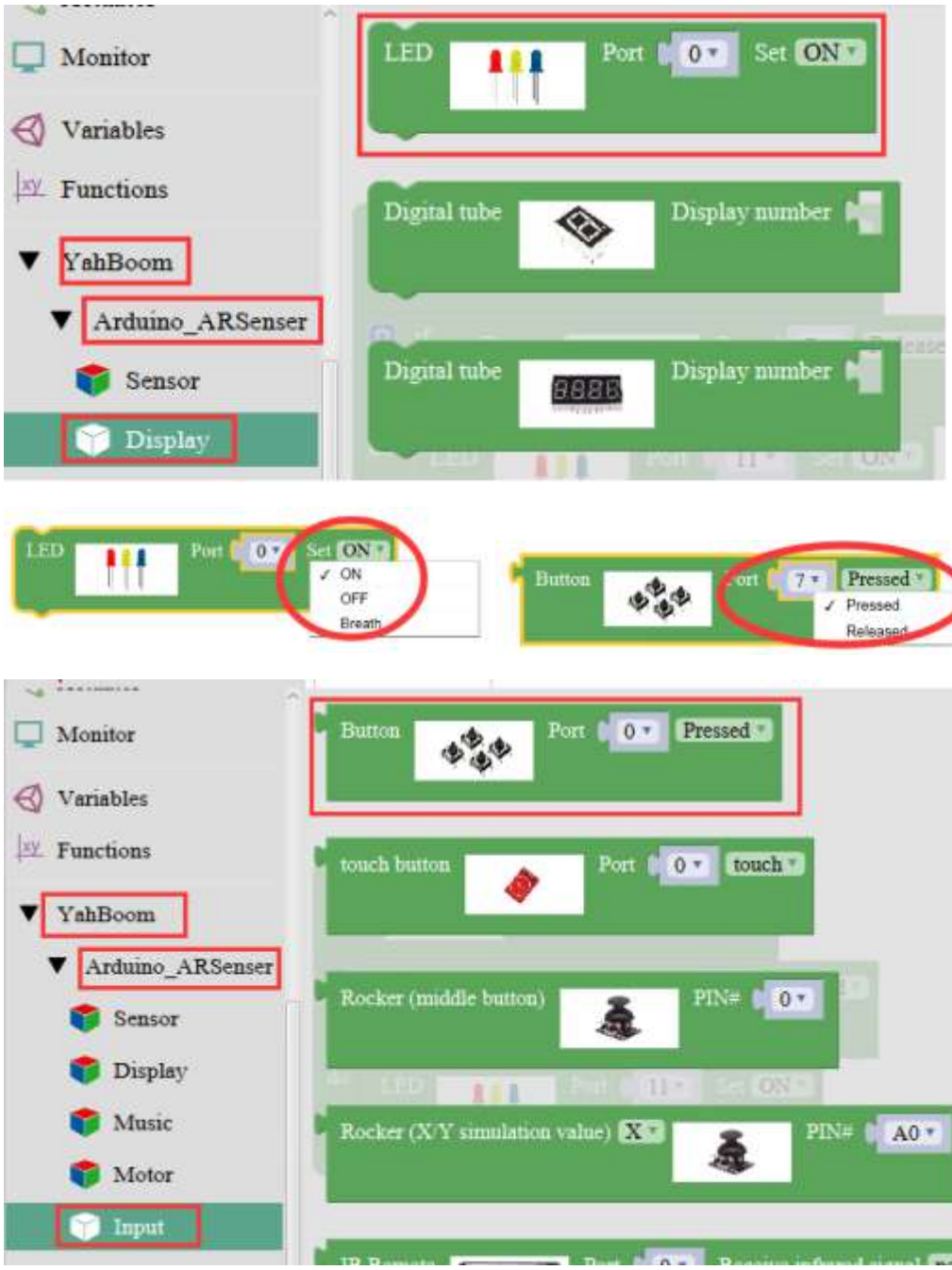
Actual object connection diagram:

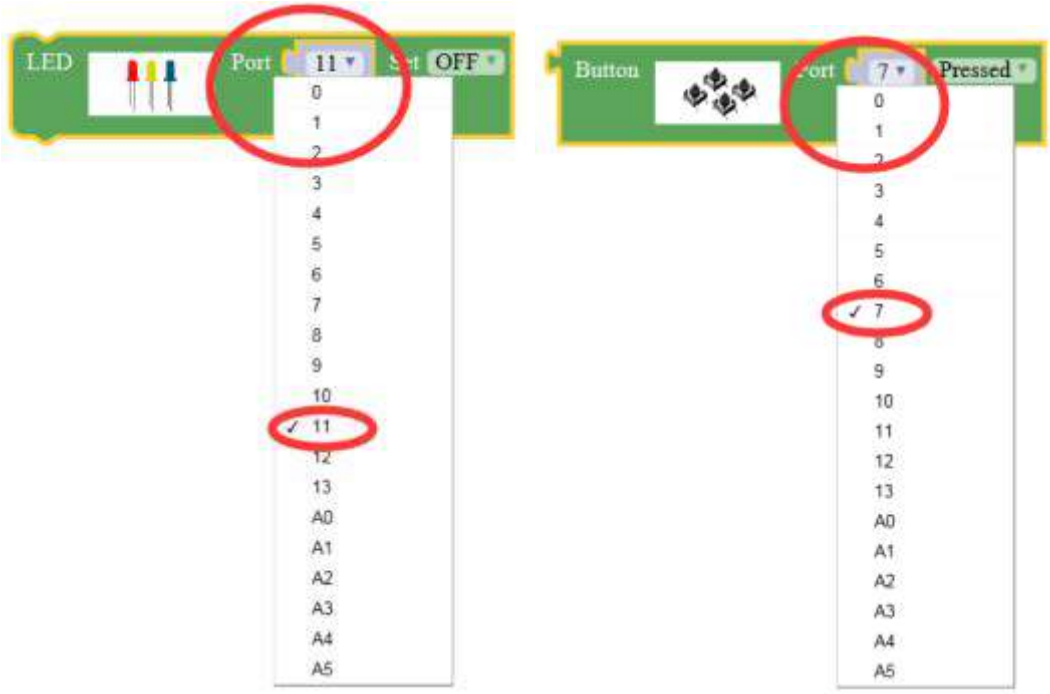
We need to connect the circuit as shown in the figure below.

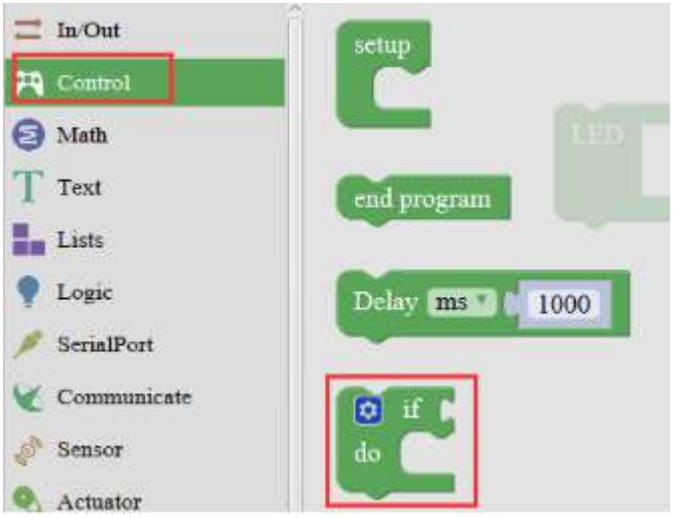


Steps of experiment:

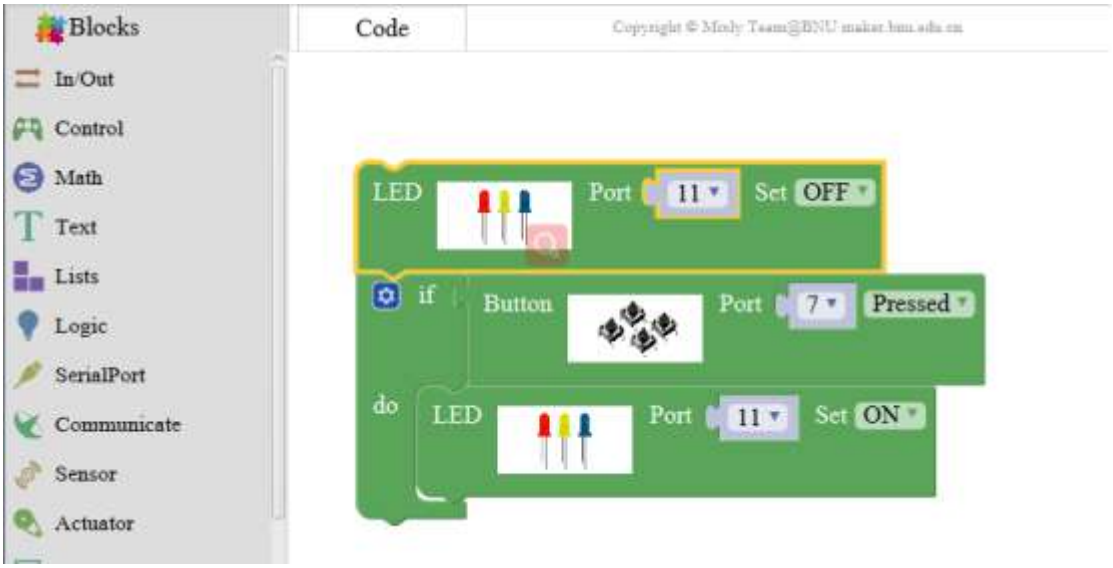
1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.





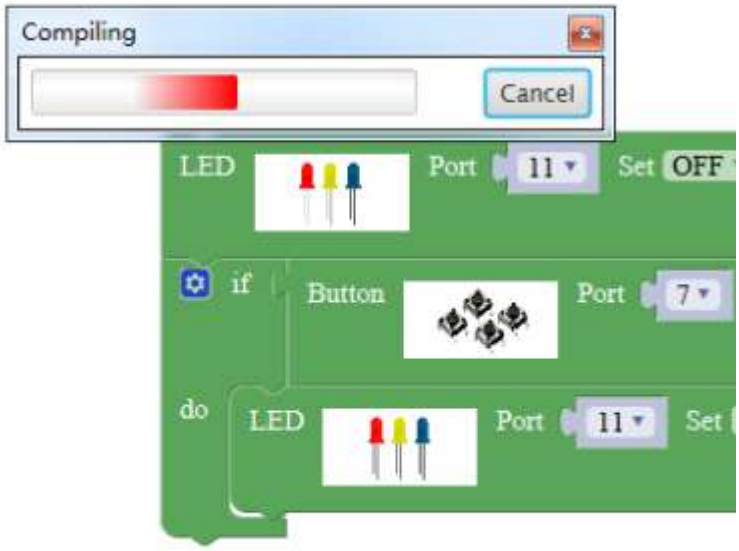


2.You need to combine the selected blocks, as shown in the figure below.

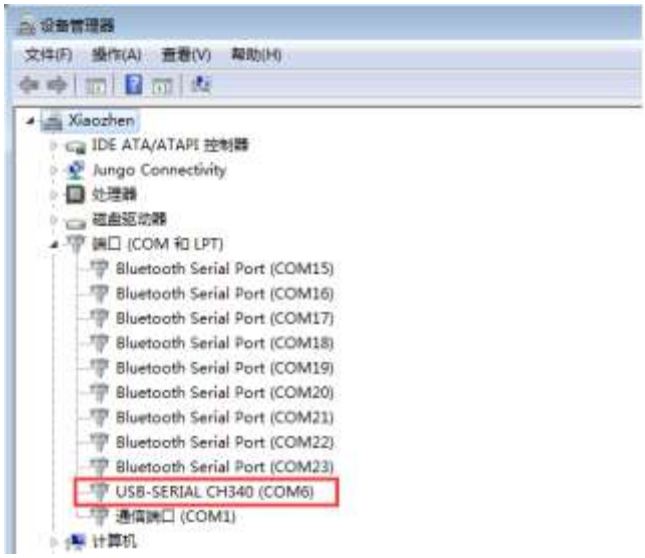


3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

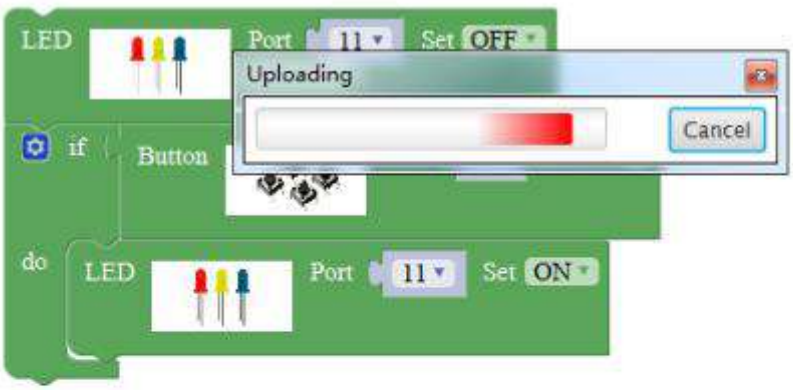
4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.



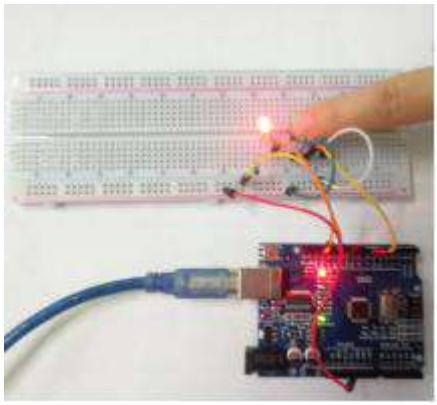
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

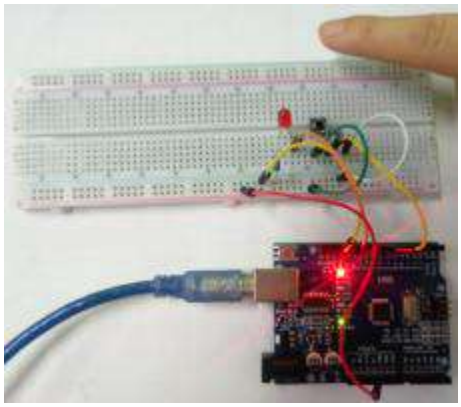


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



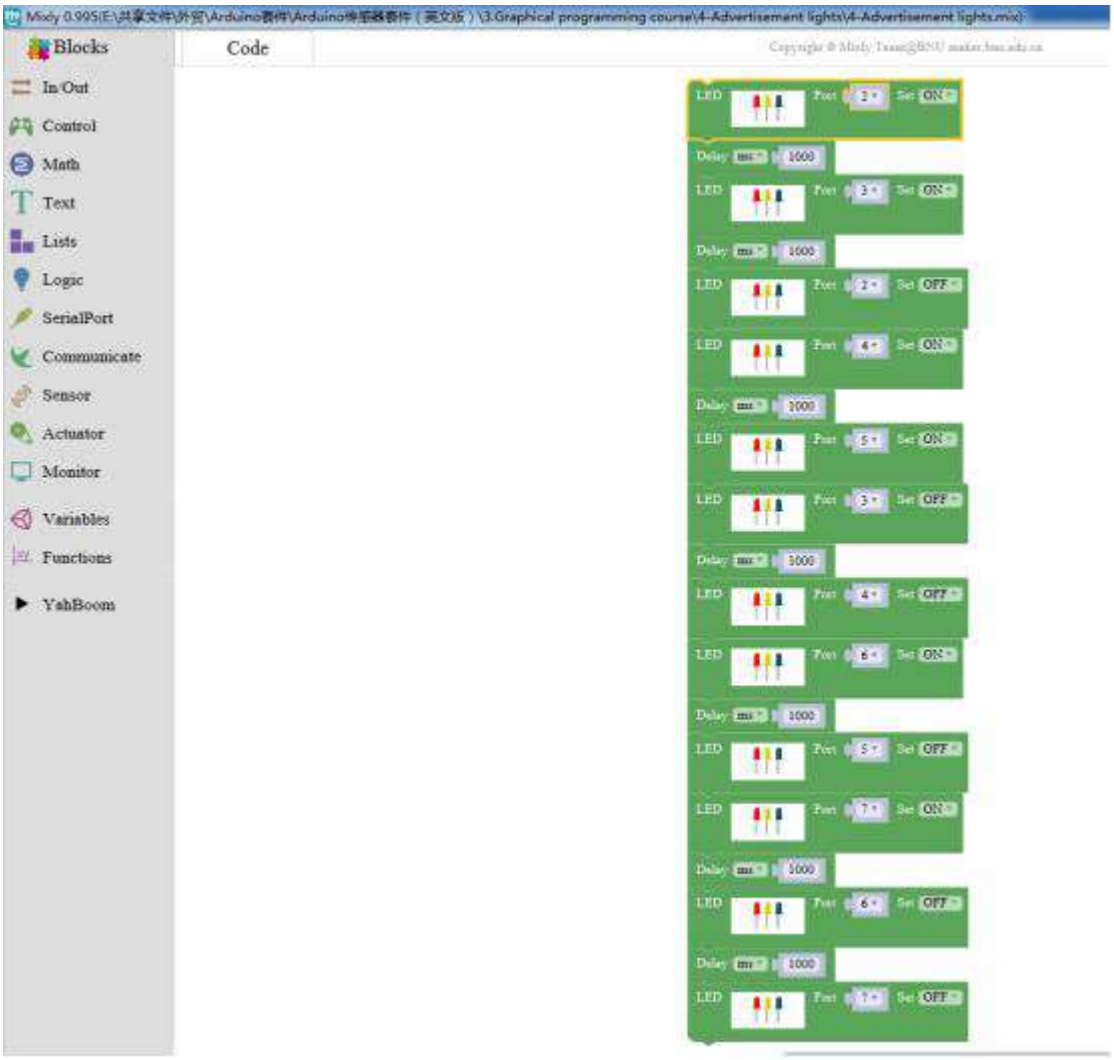
7. After the code is uploaded, when the button is pressed, the LED light will be on, and the LED light will be off when the button is released, as shown in the figure below.





4- Advertising lights

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

LED*6（Color random）

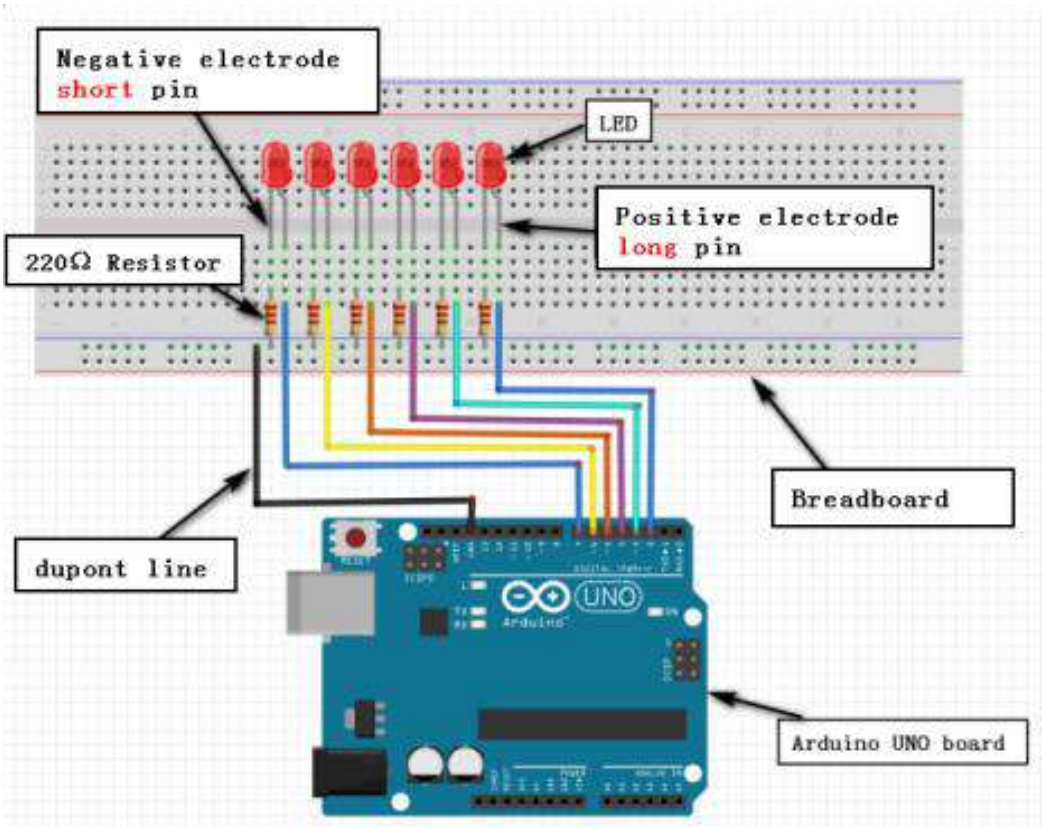
220Ω Resistor *1

Breadboard *1

Dupont line *1bunch

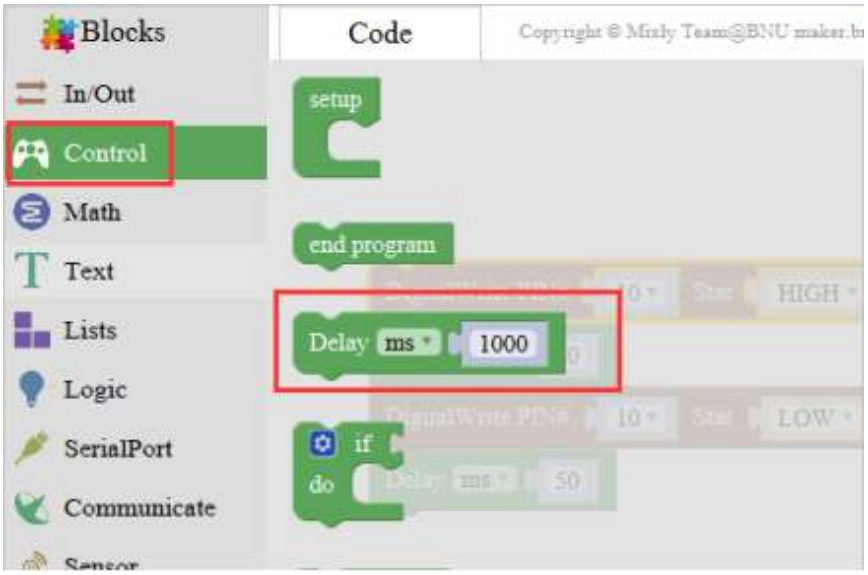
Actual object connection diagram:

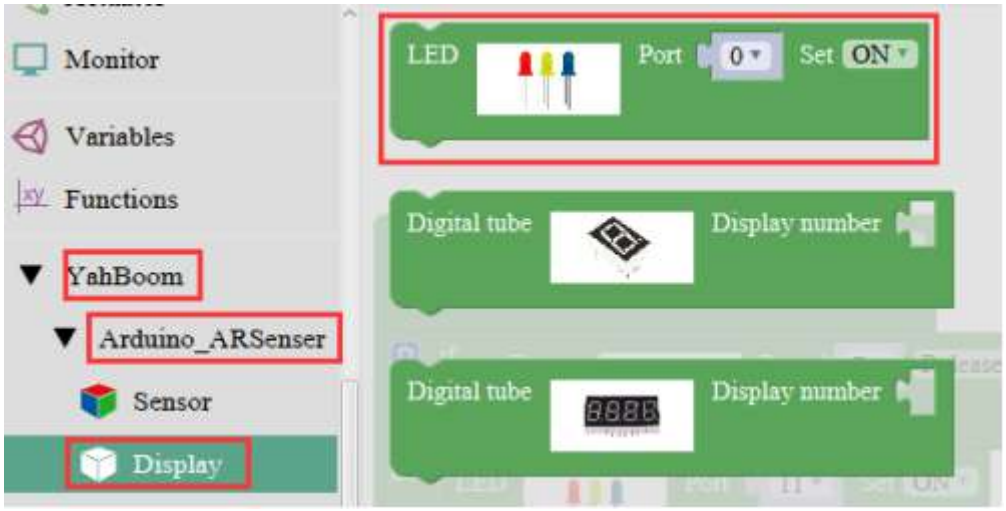
We need to connect the circuit as shown in the figure below.

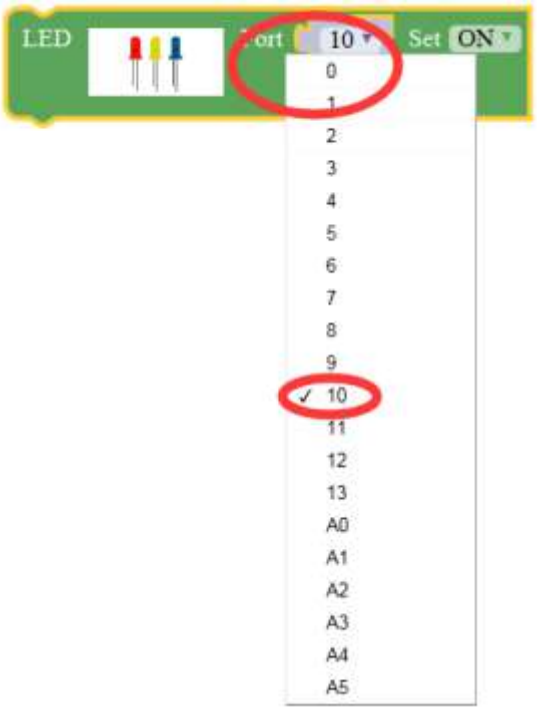


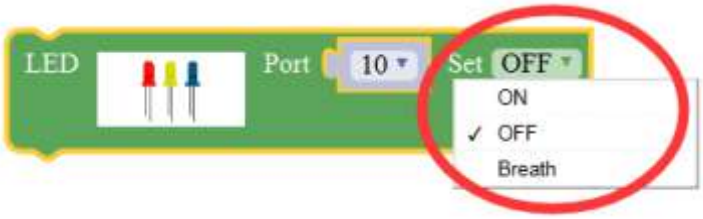
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

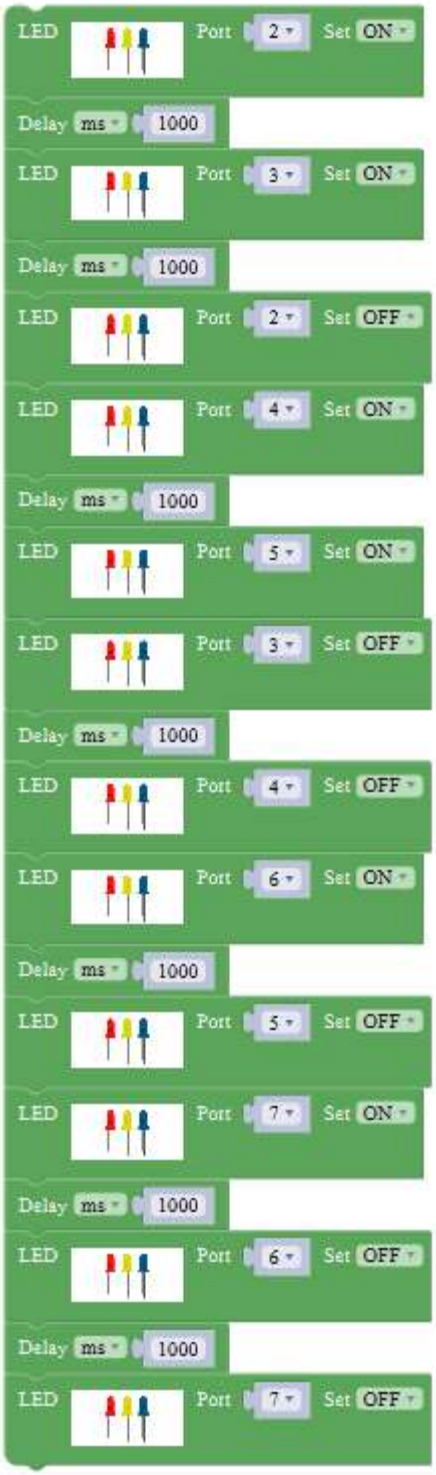








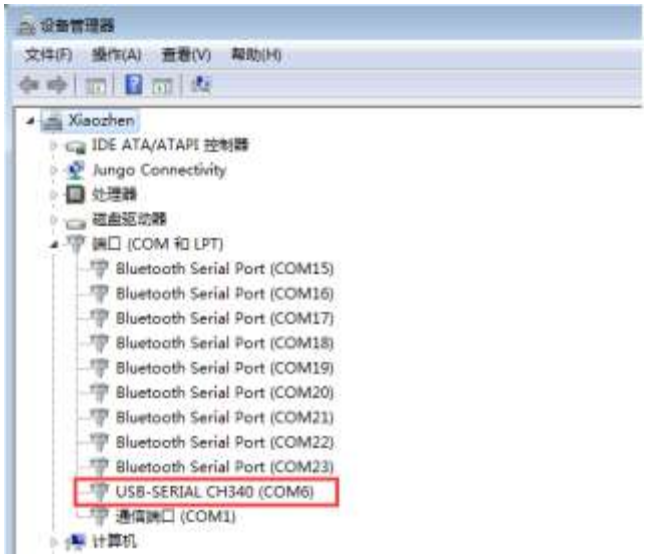
2.You need to combine the selected blocks, as shown in the figure below.



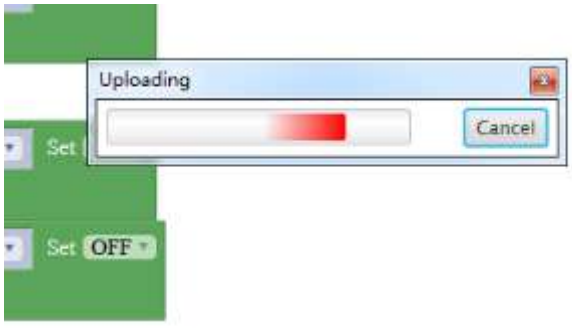
3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

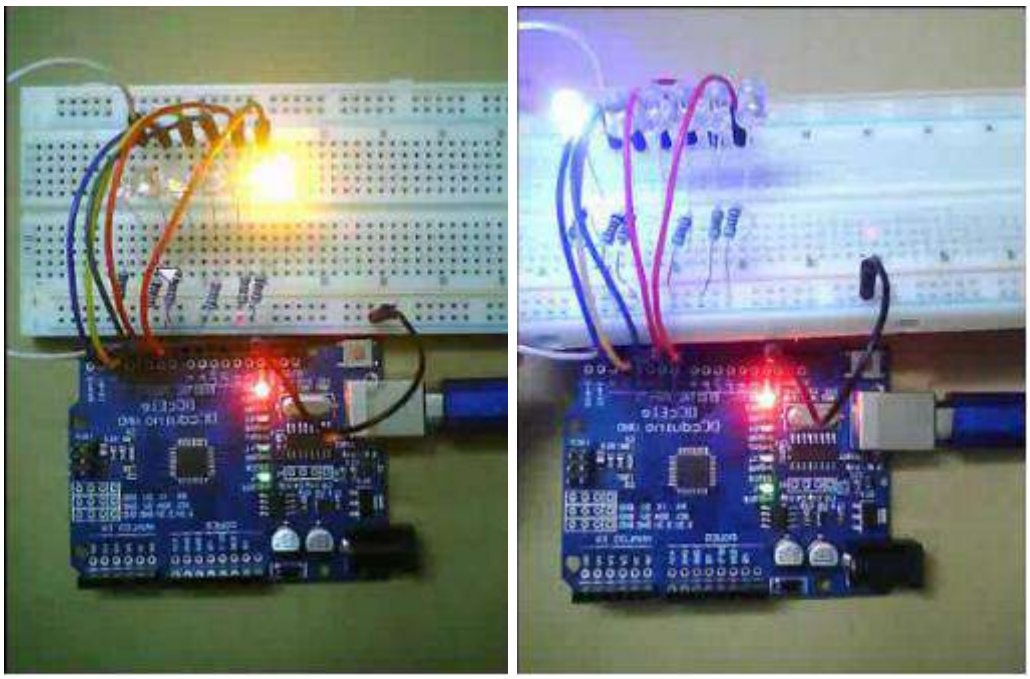
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.



6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

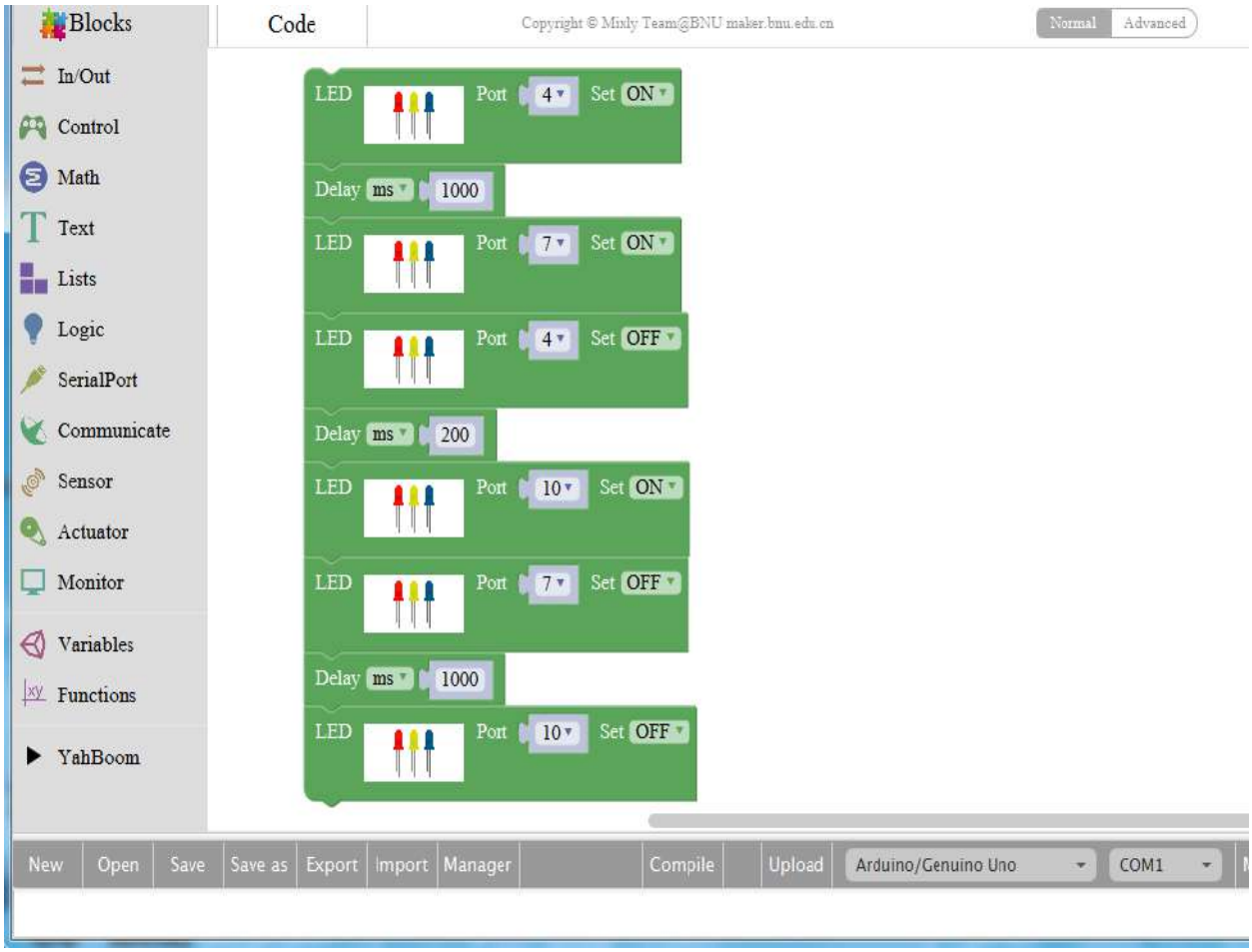


7. After the code is uploaded,we can see that 6 LED lights are turned on successively and then turned off successively, as shown in the figure below.



5- Traffic lights

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

LED*3（Color random）

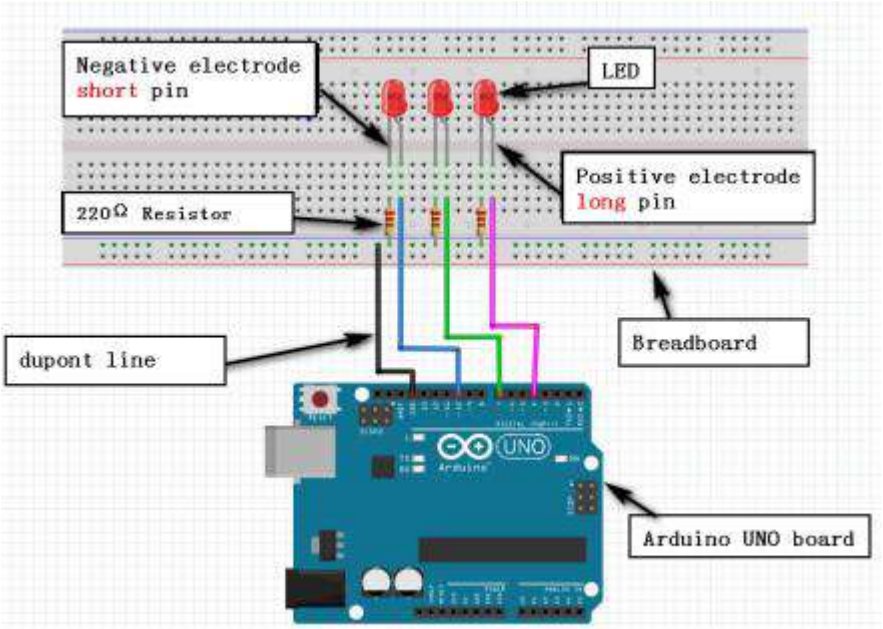
220Ω Resistor *3

Breadboard *1

dupont line *1bunch

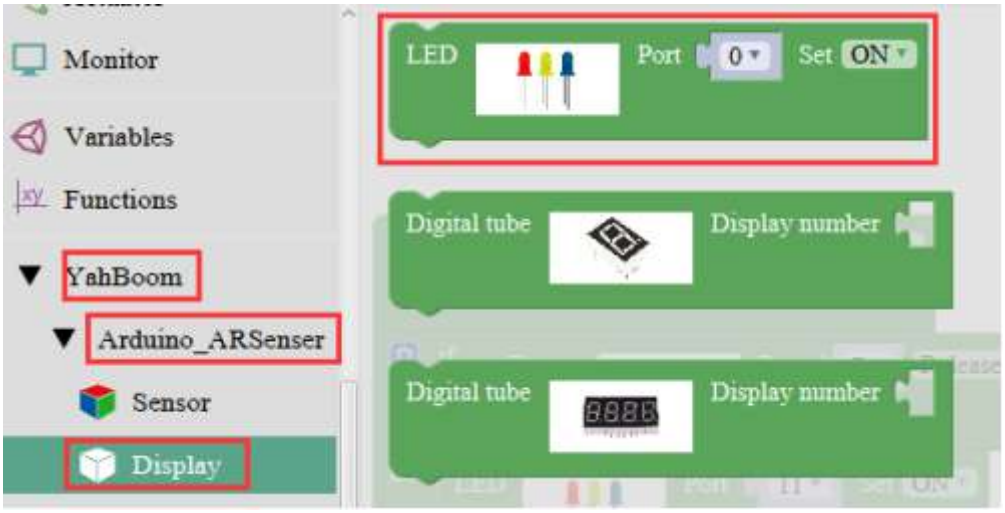
Actual object connection diagram:

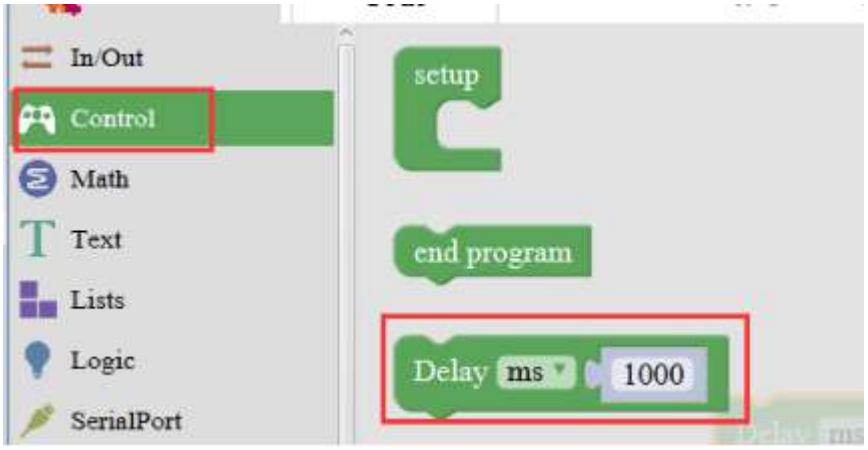
We need to connect the circuit as shown in the figure below.

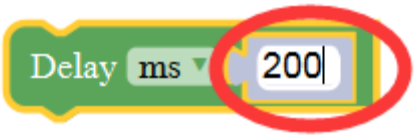


Steps of experiment:

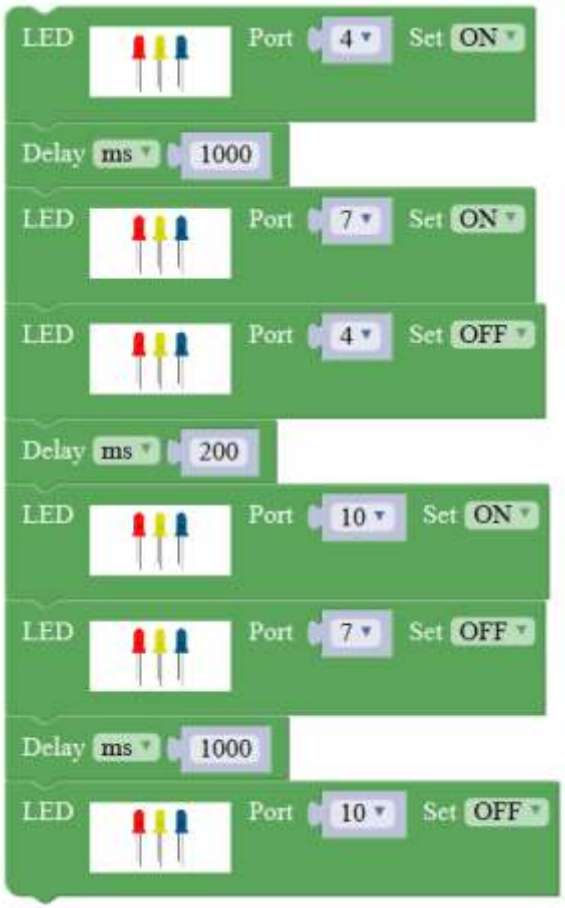
1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.







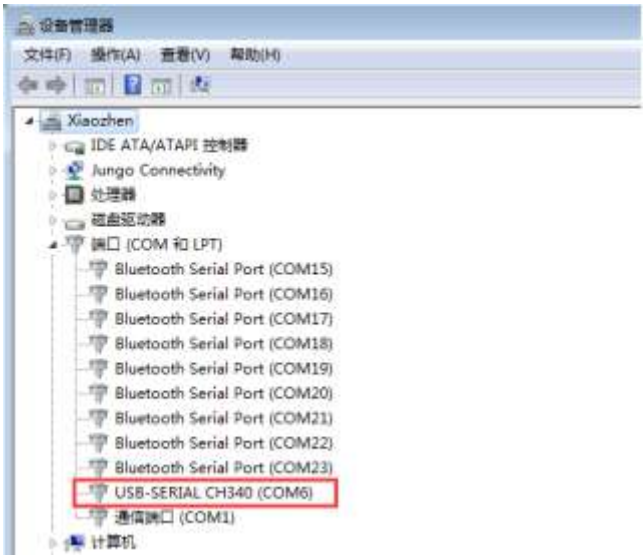
2.You need to combine the selected blocks, as shown in the figure below.



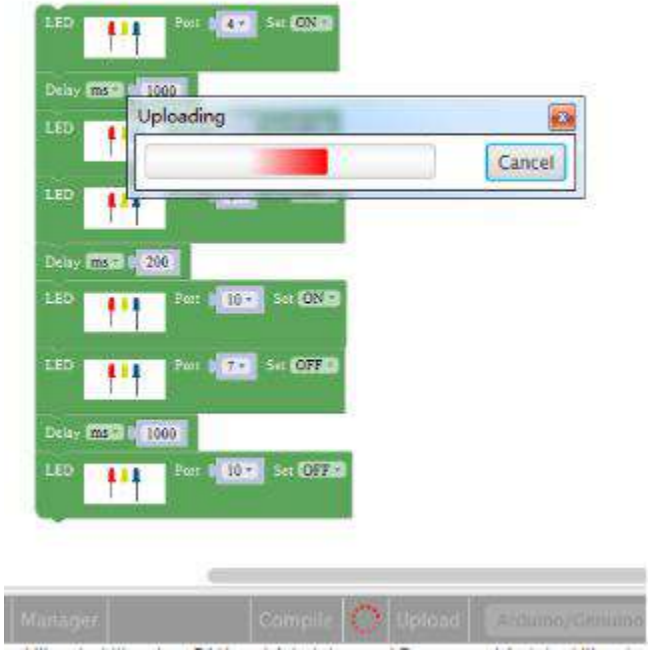
3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

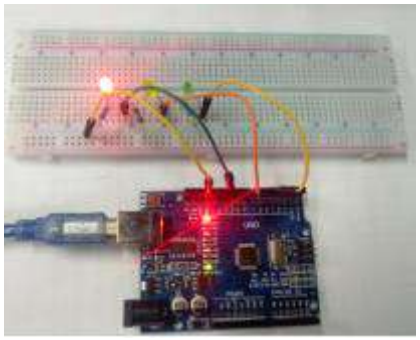
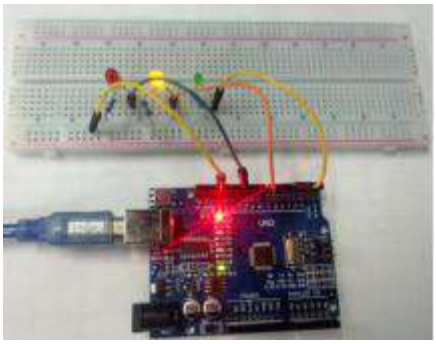
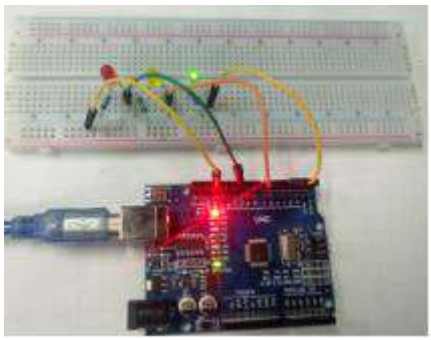
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.



6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

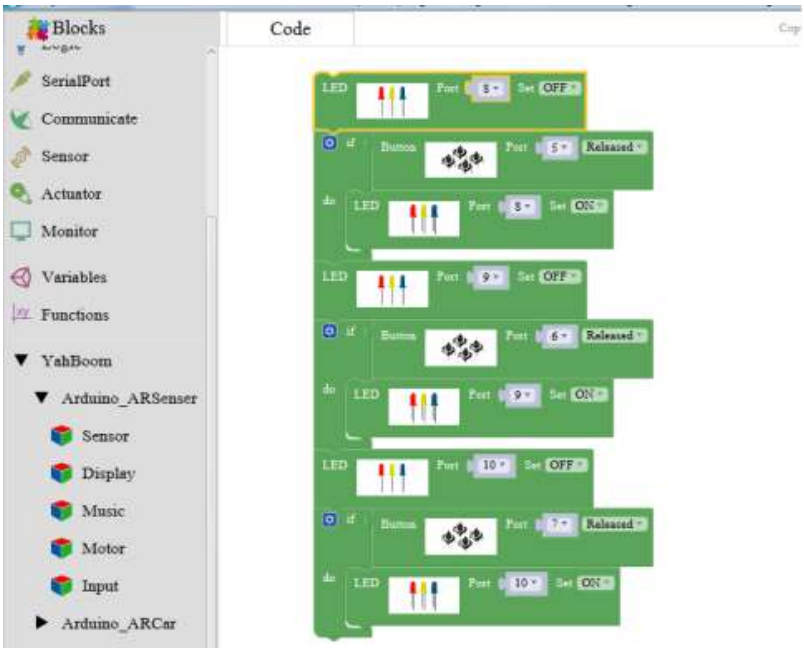


7. After the code is uploaded, we can see that the red light is on for 1 second, the yellow light is on for 0.2 seconds, and the green light is on for 1 second, as shown in the figure below.

6- Answering machine

You need to follow the steps below to build blocks.



Arduino UNO board *1

USB cable *1

LED*3（Color random）

220Ω Resistor *3

10kΩ Resistor *3

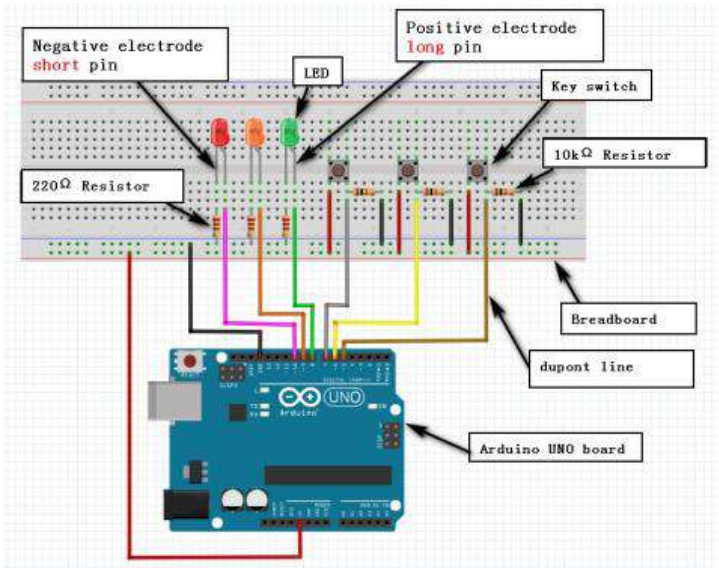
Key switch *3

Breadboard *1

Dupont line *1bunch

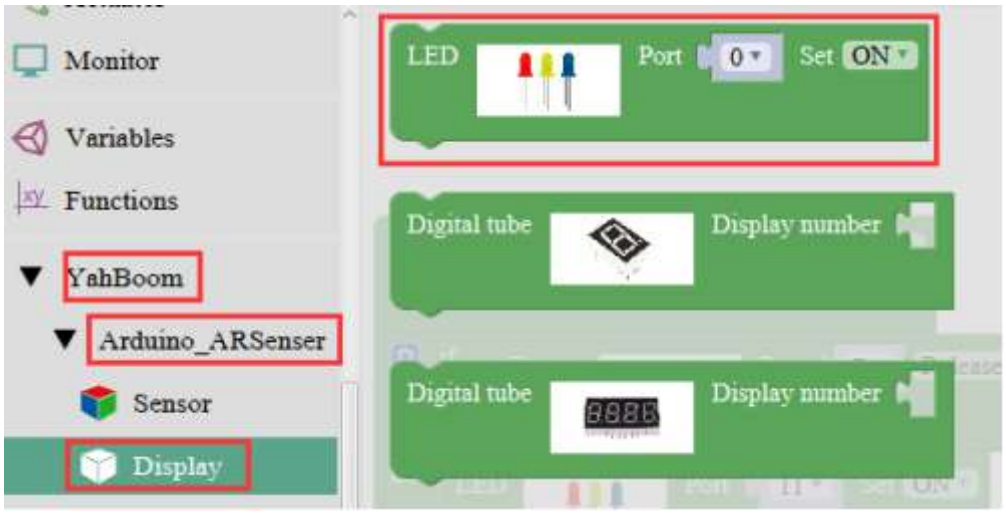
Actual object connection diagram:

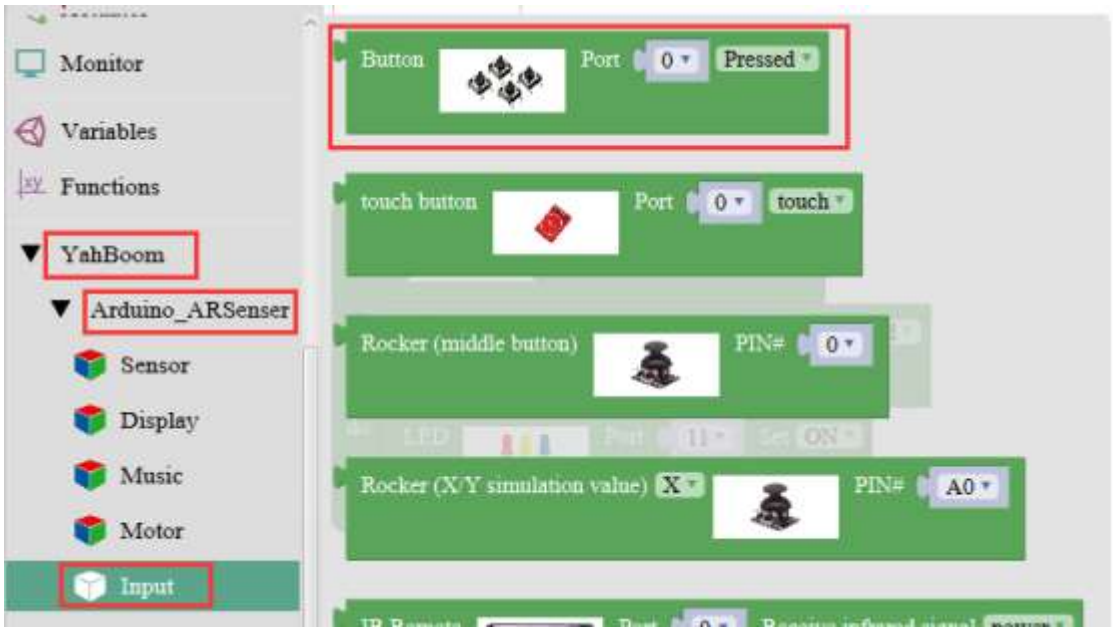
We need to connect the circuit as shown in the figure below.



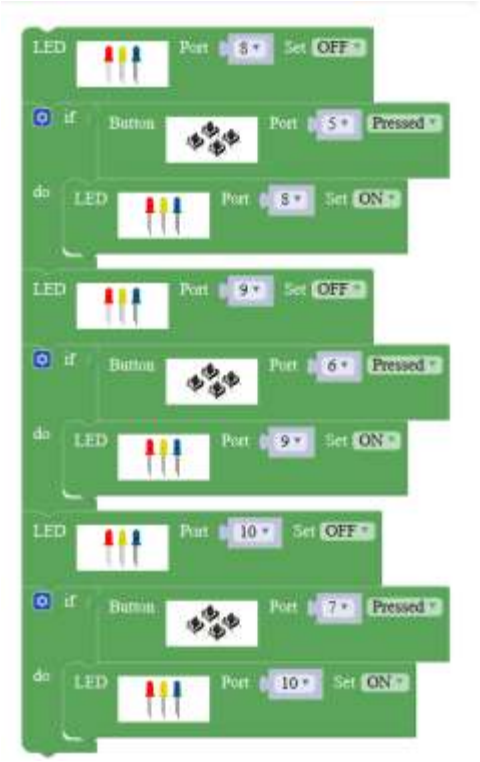
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



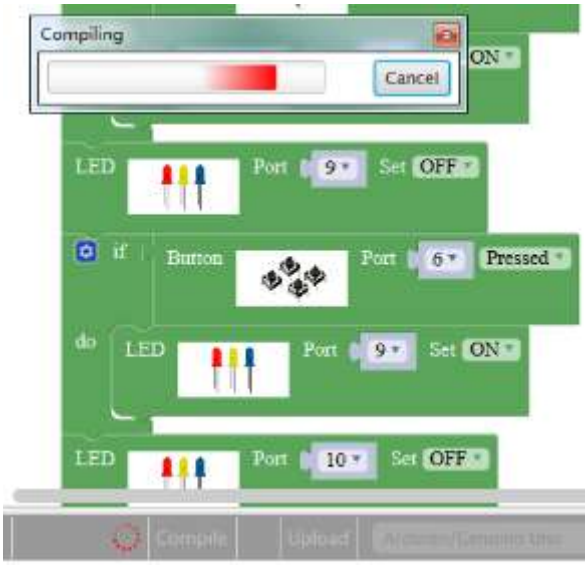


2.You need to combine the selected blocks, as shown in the figure below.

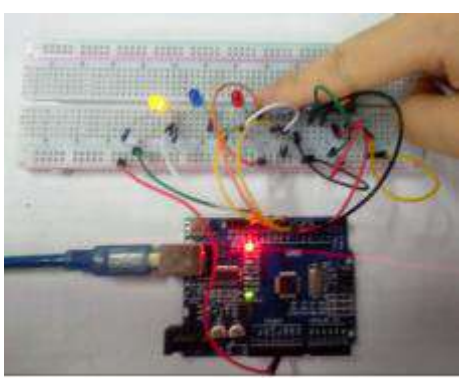


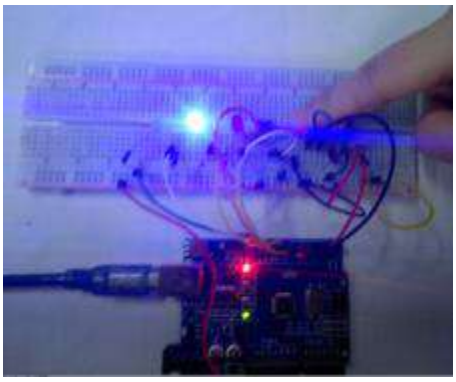
3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

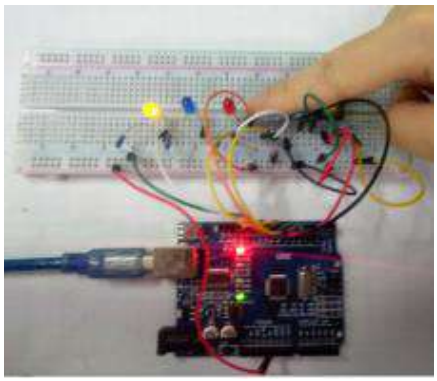
4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.



5.After the code is uploaded, when different buttons are pressed, the LED lights of different colors will be turned on and the LED lights will be extinguished when the button is released, as shown in the figure below.

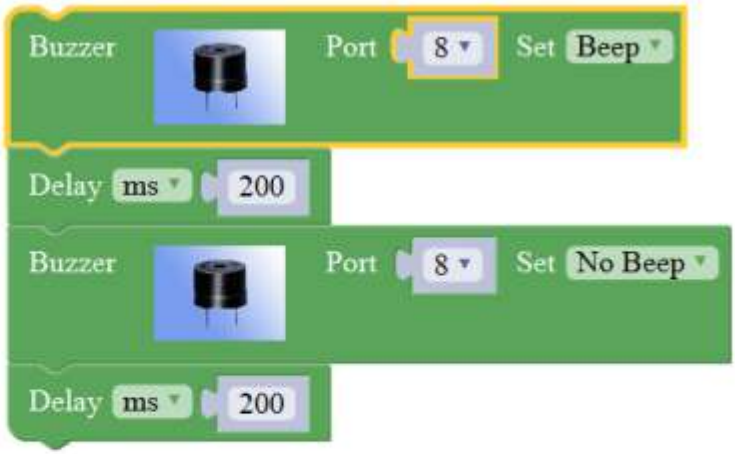






7.1- Active buzzer

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω Resistor *1

Active buzzer *1

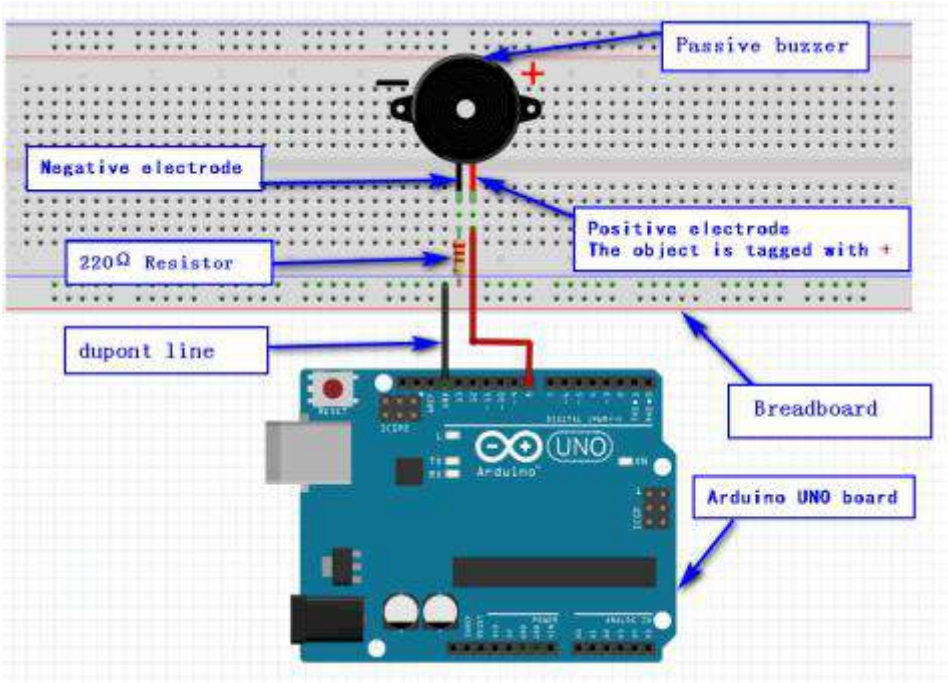
Breadboard *1

Dupont line *1bunch

Actual object connection diagram:

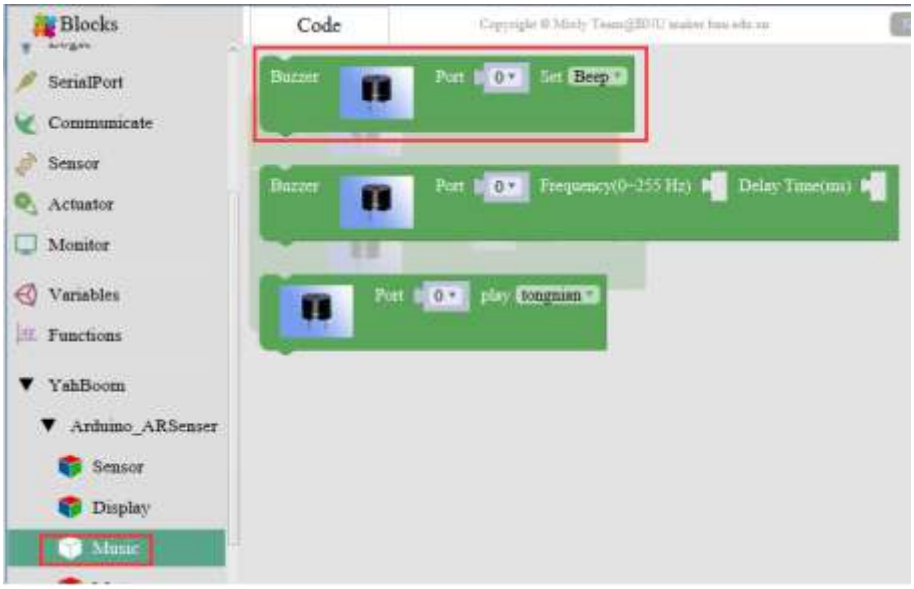
We need to connect the circuit as shown in the figure below.

Note: The active buzzer has positive and negative electrode. The actual object diagram below shows that the buzzer has positive and negative marks.



Steps of experiment:

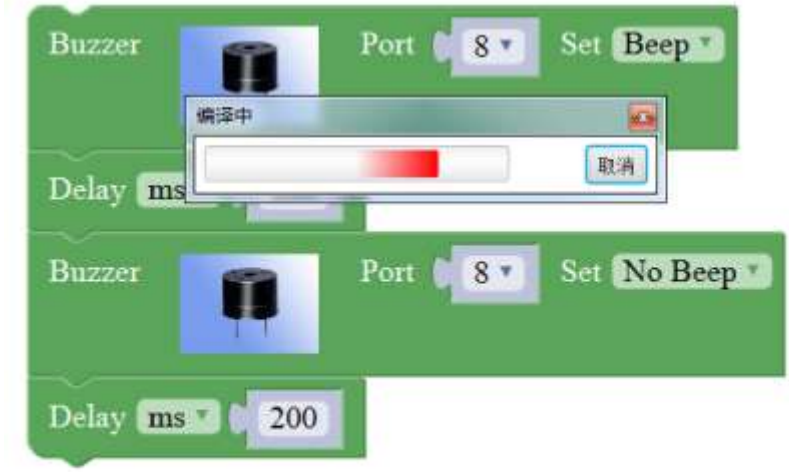
1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



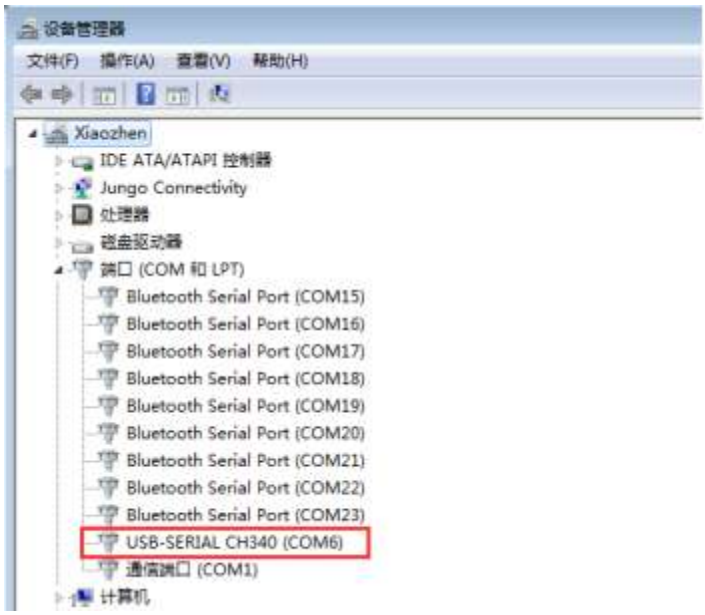
2.You need to combine the selected blocks, as shown in the figure below.

3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

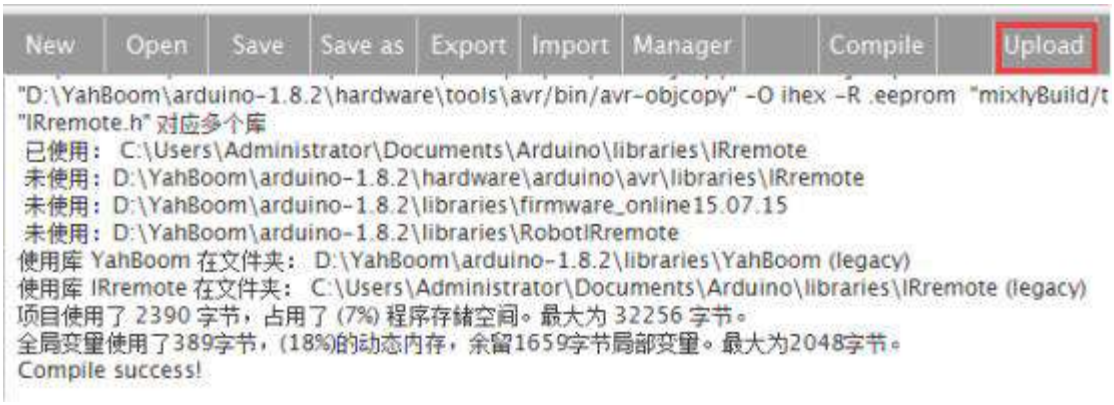
4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

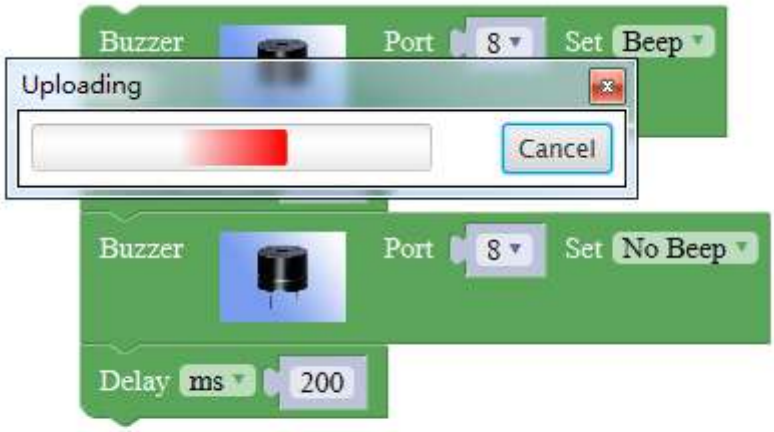


5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

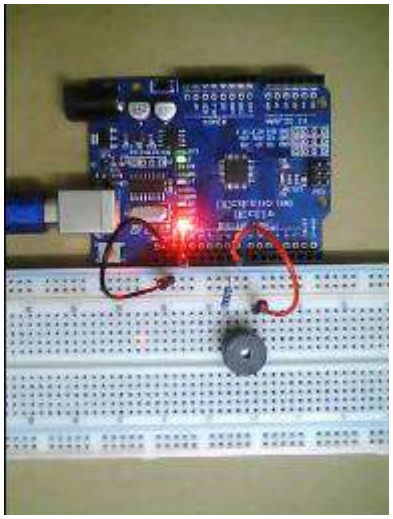


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



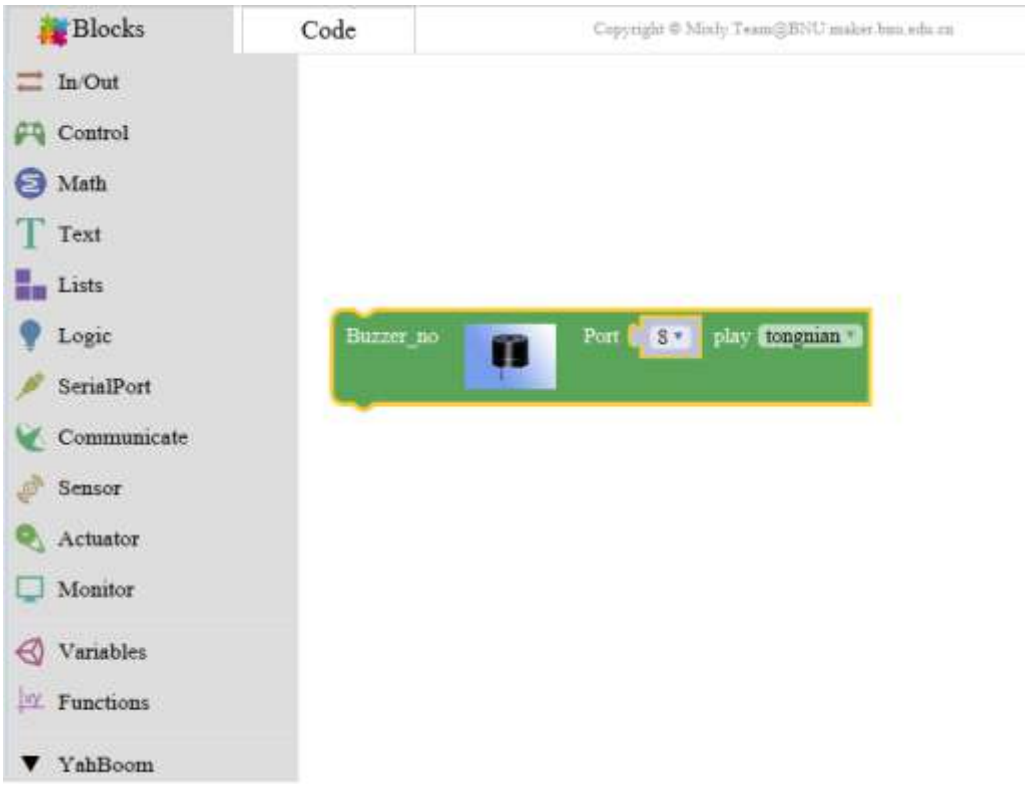


4. After the code is uploaded, we can hear the buzzer sound every 0.2 seconds. As shown in the following figure.



7.2- Passive buzzer music

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω Resistor *1

Passive buzzer *1

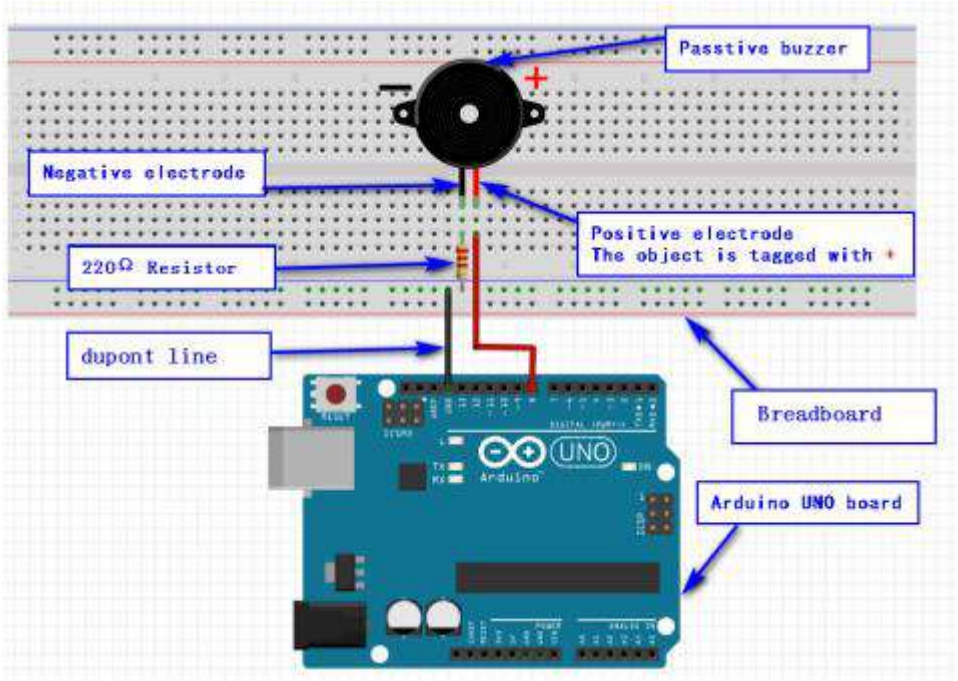
Breadboard *1

Dupont line *1bunch

Actual object connection diagram:

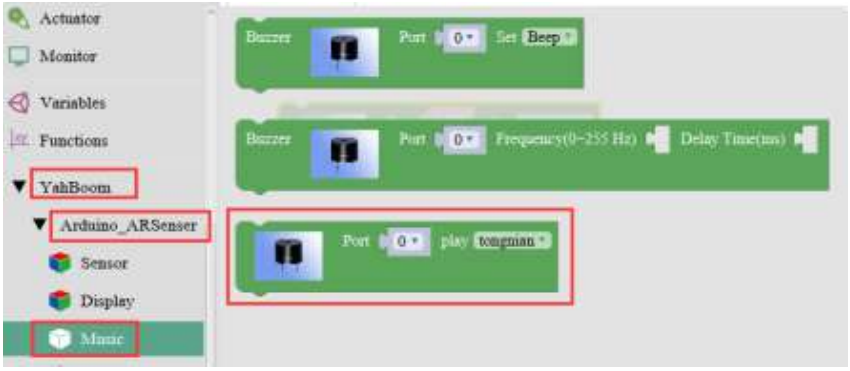
We need to connect the circuit as shown in the figure below.

Note: The passive buzzer has positive and negative electrode. The actual object diagram below shows that the buzzer has positive and negative marks.



Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



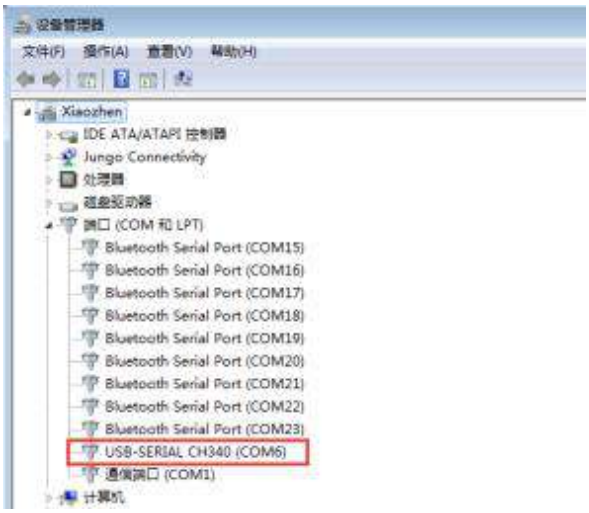
2.You need to combine the selected blocks, as shown in the figure below.

3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

ild.path=mixlyBuild --verify "D:\YahBoom/testArduino/testArduino.ino"

5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

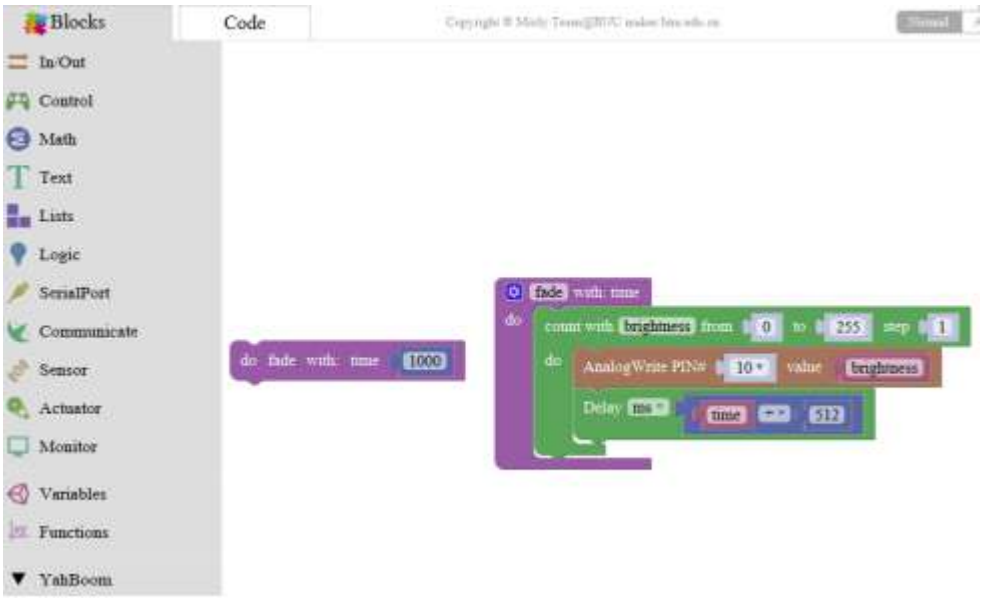


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

7. After the code is uploaded, you can hear the buzzer is playing music.

8- PWM dimming

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

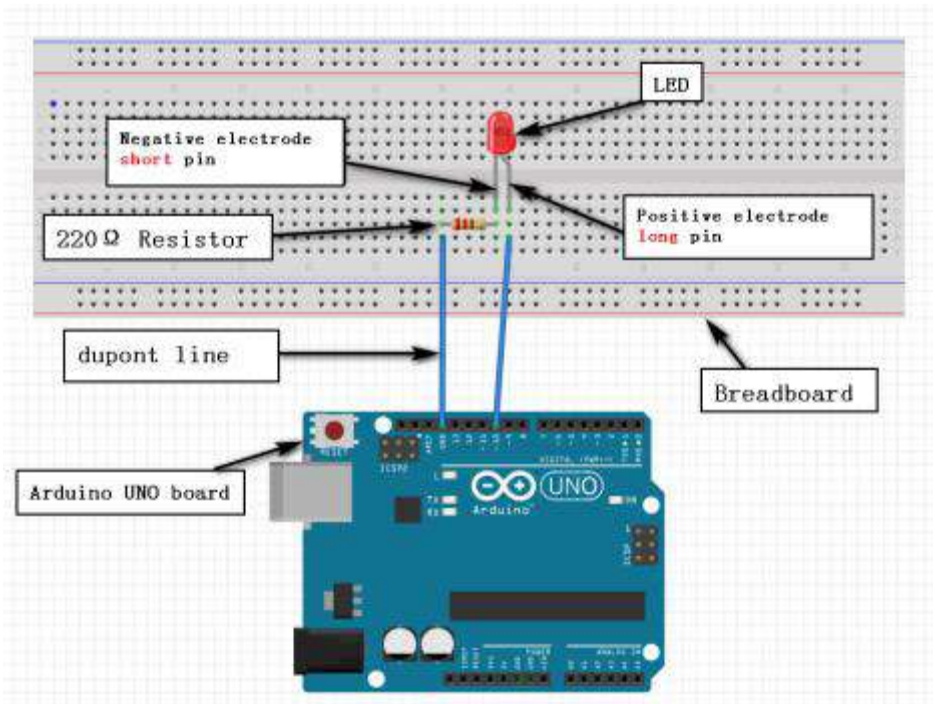
LED*1 (color random)

220Ω resistor *1

Breadboard *1

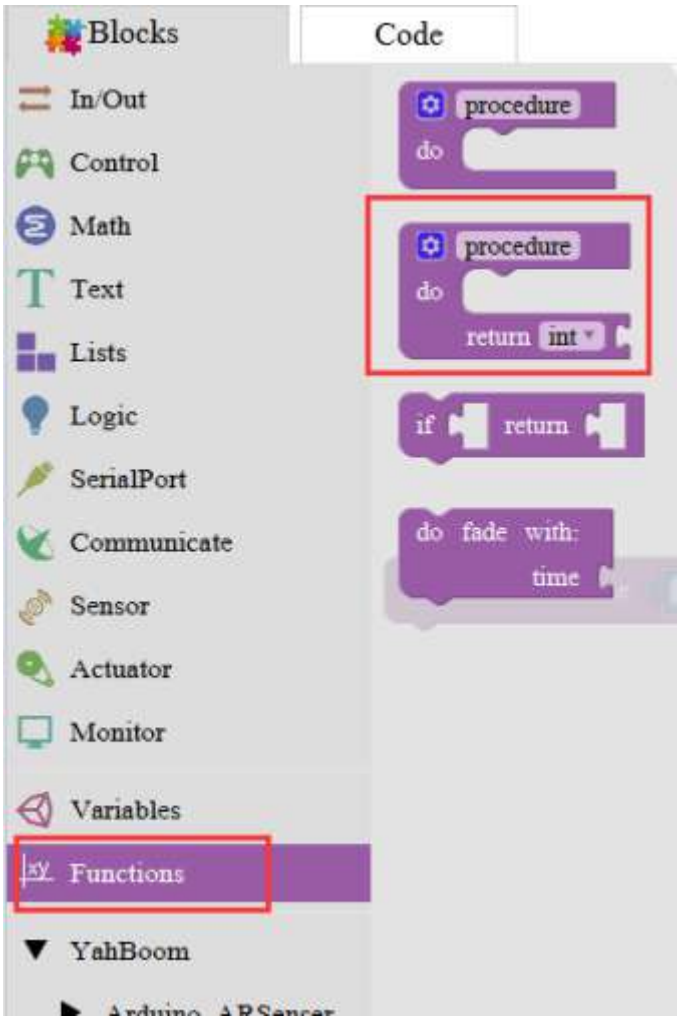
Dupont line *1 bunch

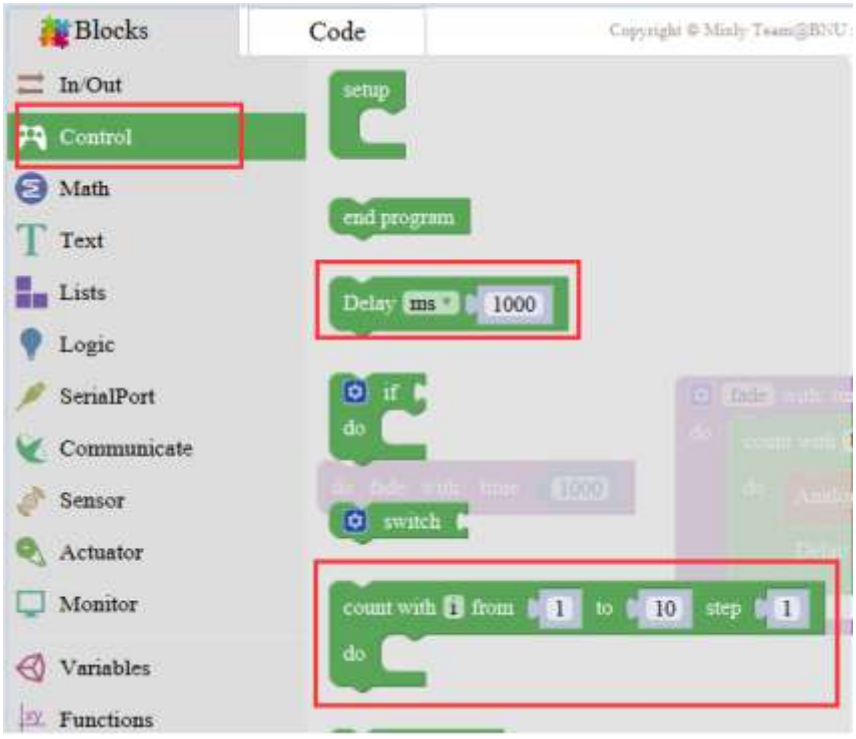
Actual object wiring diagram:

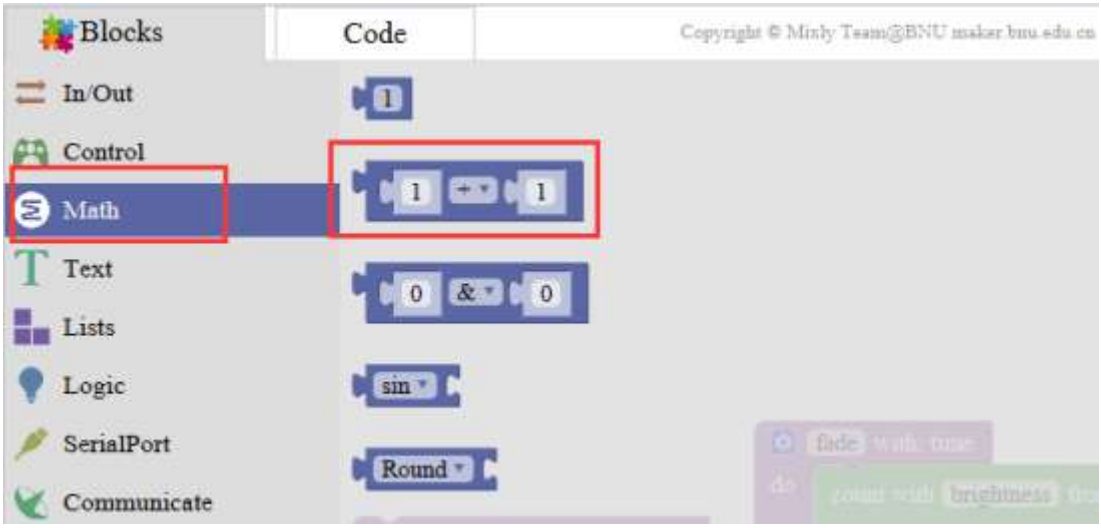


Steps of experiment:

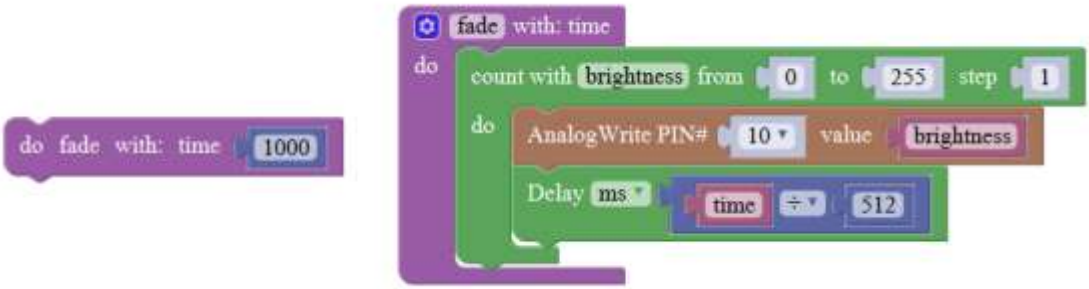
1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.





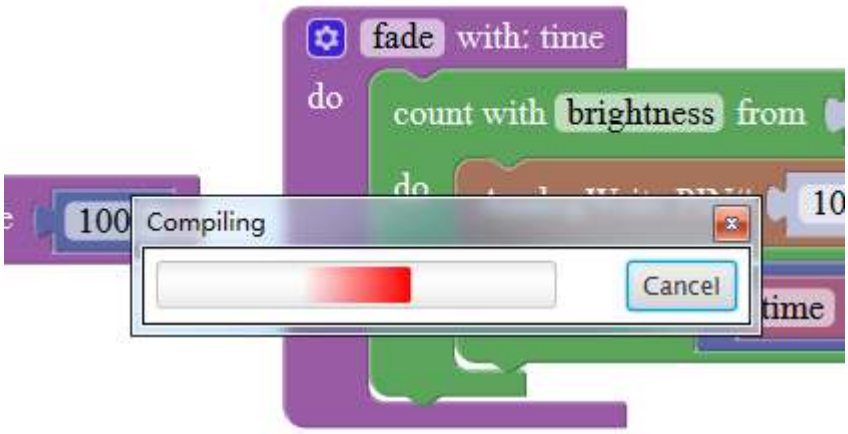


2.You need to combine the selected blocks, as shown in the figure below.

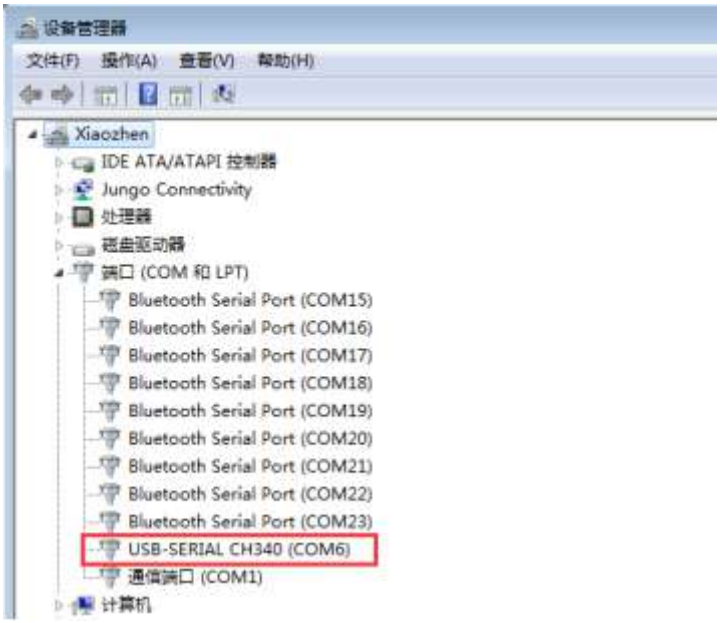


3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

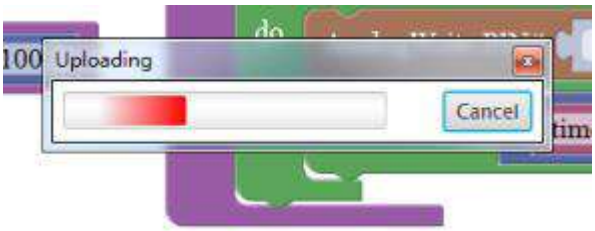
4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.

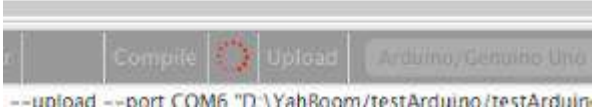


5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.

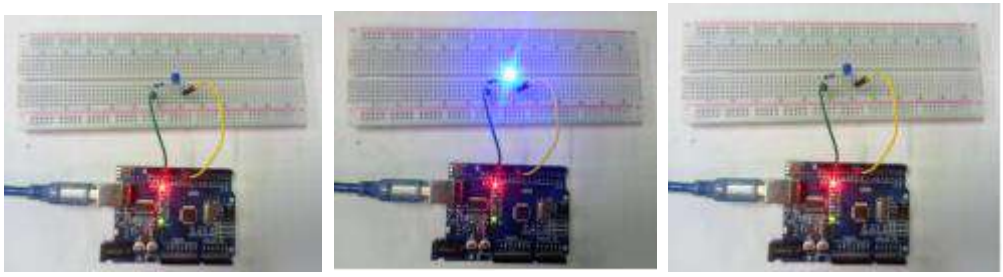


6. After the selection is completed, you need to click "**Upload**" to upload the code to the Arduino UNO board. When the word "**Upload success**" appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.





7.After the code is uploaded, we can see that the LED slowly cycles from dark to light to dark, and it keeps looping. As shown in the figure below.



9- Light controlled sound

You need to follow the steps below to build blocks.

List of components required for the experiment:

Arduino UNO board *1

USB cable *1

Photosensitive resistor *1

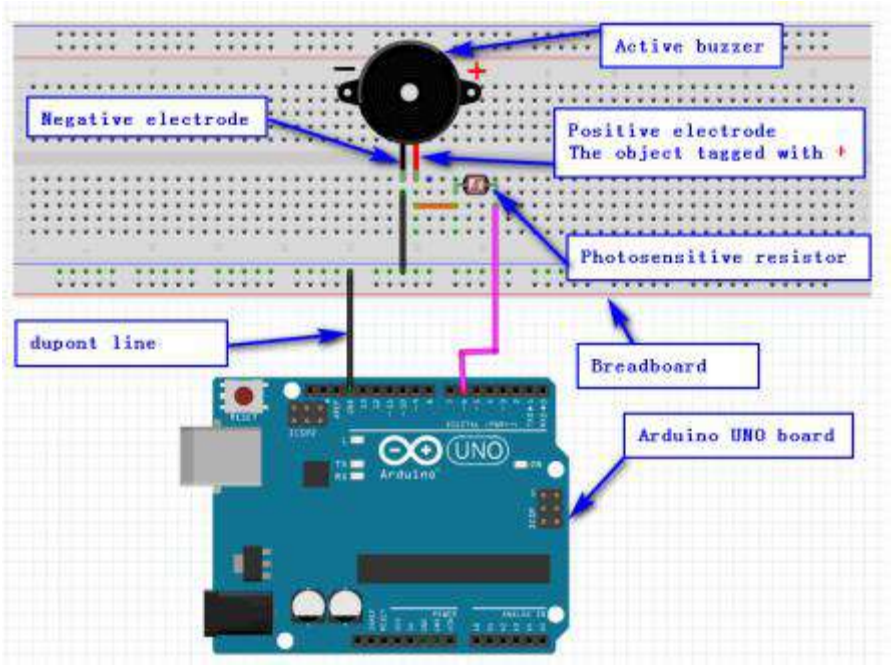
Active buzzer *1

Breadboard *1

Dupont line *1bunch

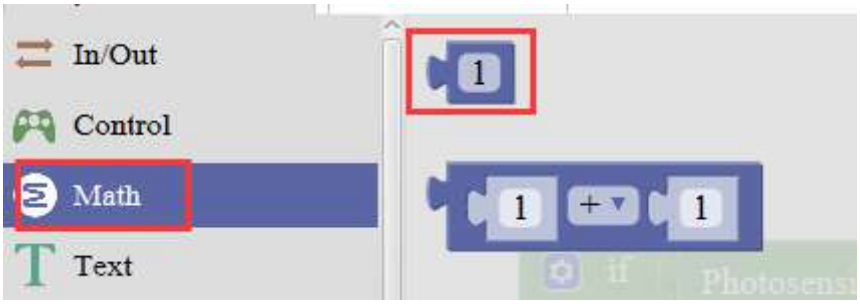
Actual object connection diagram:

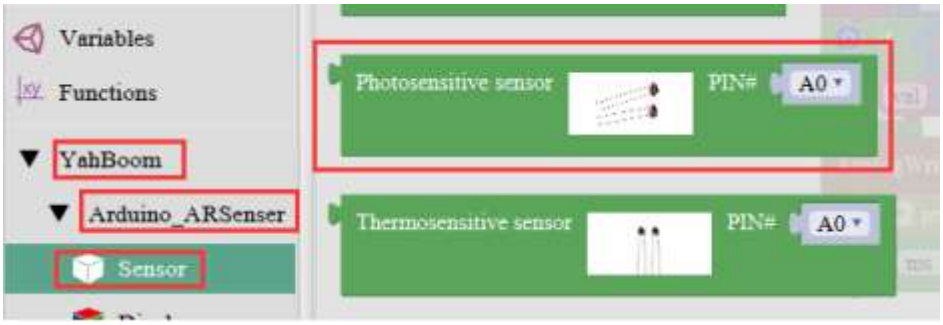
We need to connect the circuit as shown in the figure below.



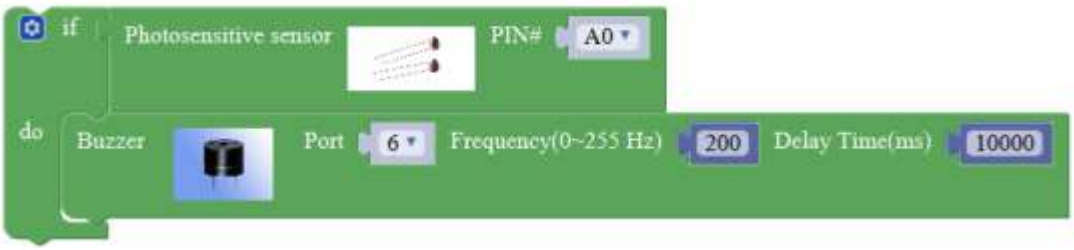
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



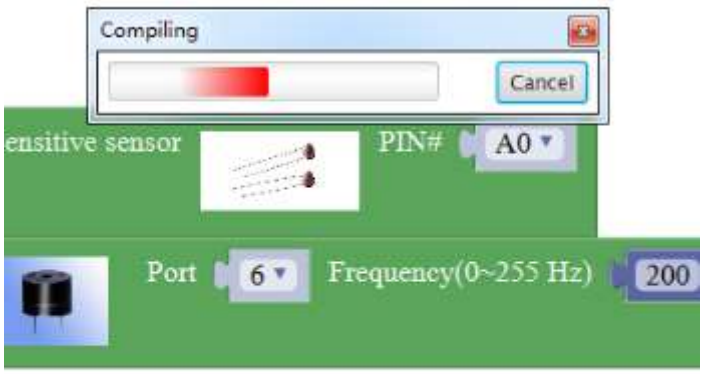


2.You need to combine the selected blocks, as shown in the figure below.

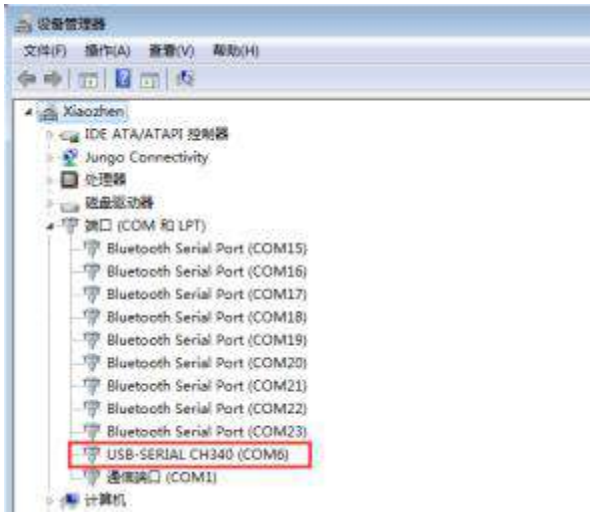


3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

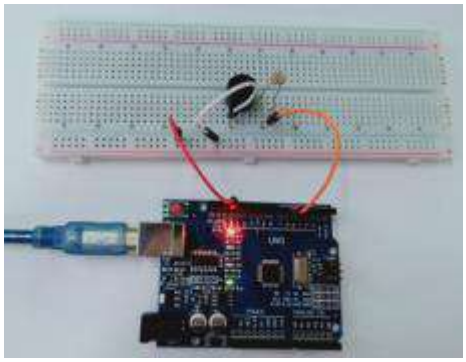


5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.



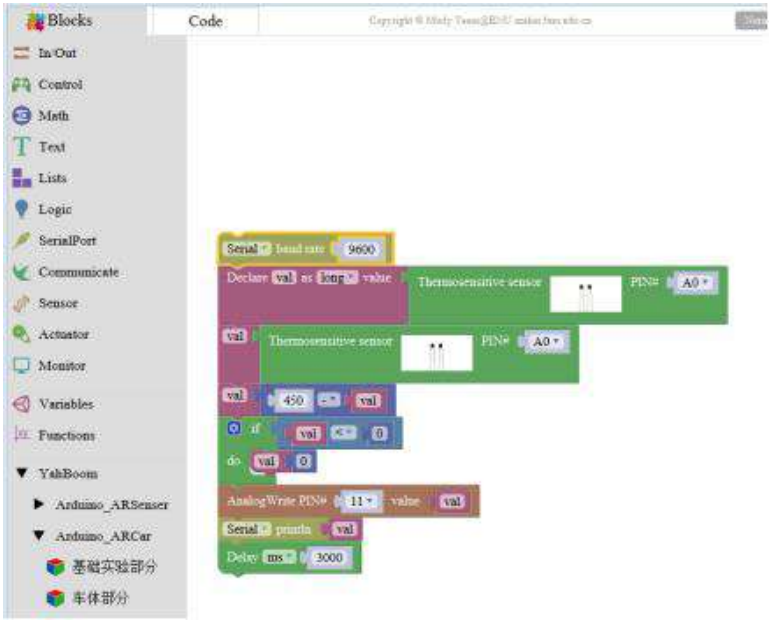
6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

7. After the code is uploaded. When the photoresistor receives illumination, you can hear the buzzer sound. When the light is removed, the buzzer does not sound. The reason for this phenomenon is that the light change the resistance of the photoresistor.



10- Sensible heat light

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

Negative temperature coefficient Thermistor*1

220Ω resistor *1

10kΩ resistor *1

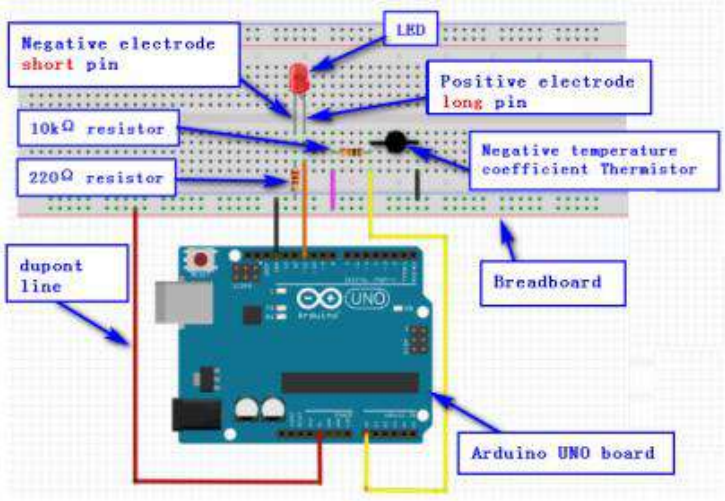
LED *1

Breadboard *1

Dupont line *1 bunch

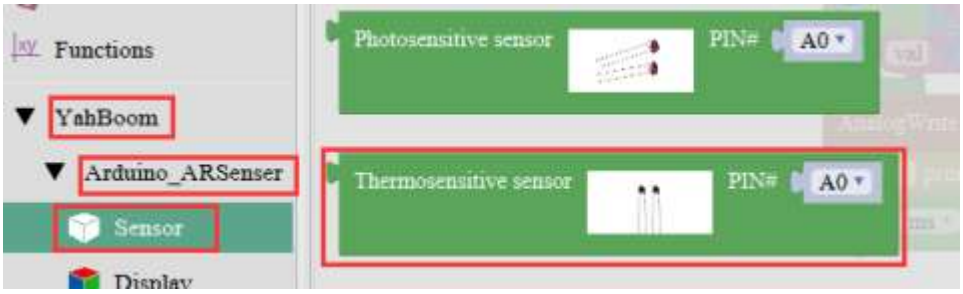
Actual object connection diagram：

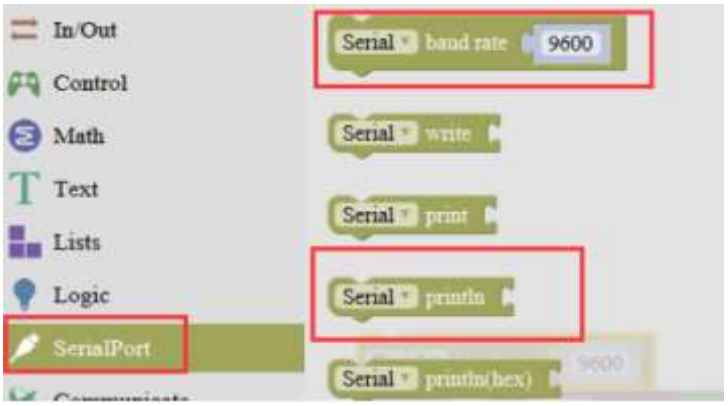
We need to connect the circuit as shown in the figure below.

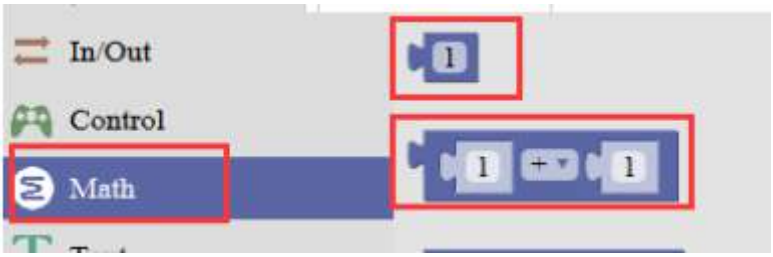


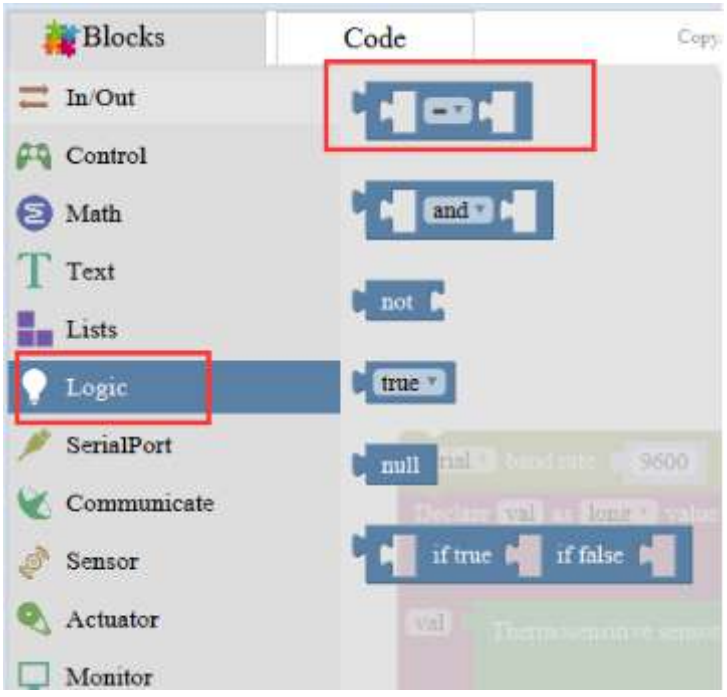
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

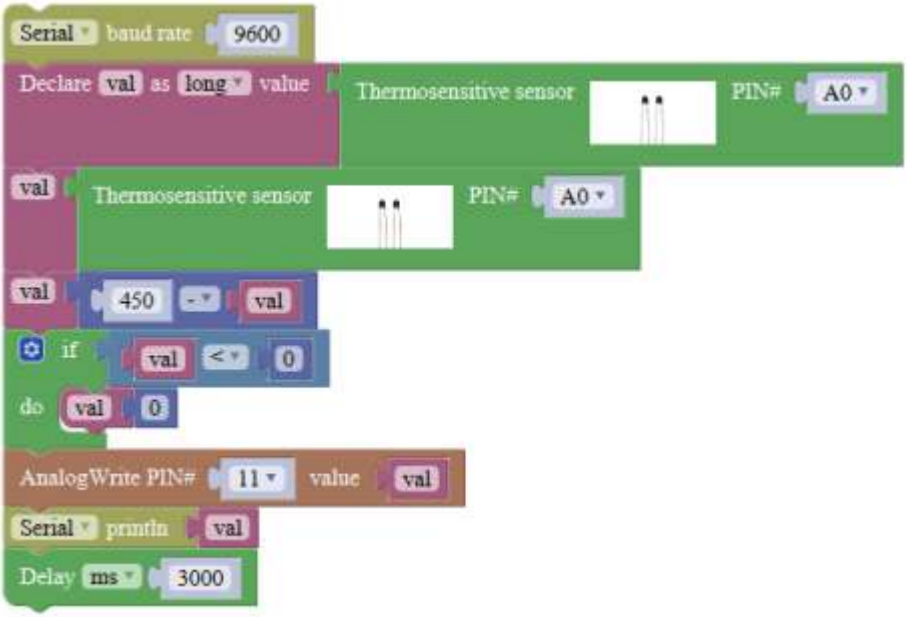






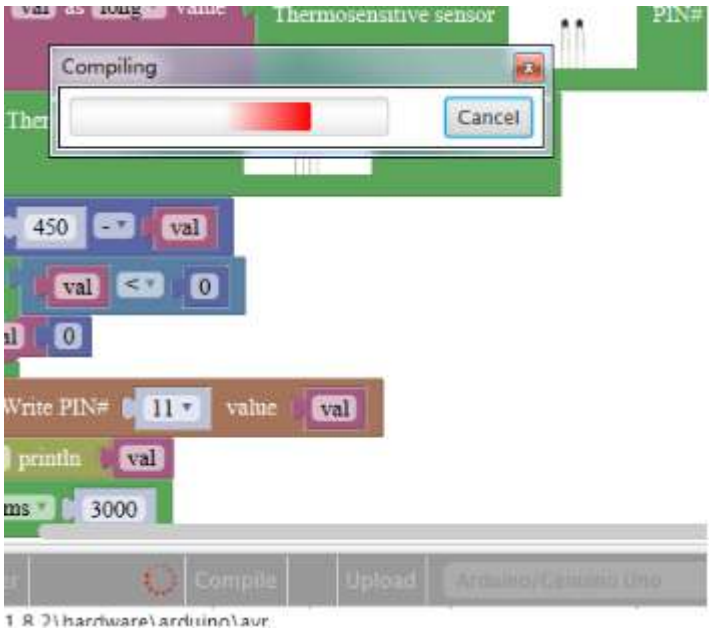


2.You need to combine the selected blocks, as shown in the figure below.

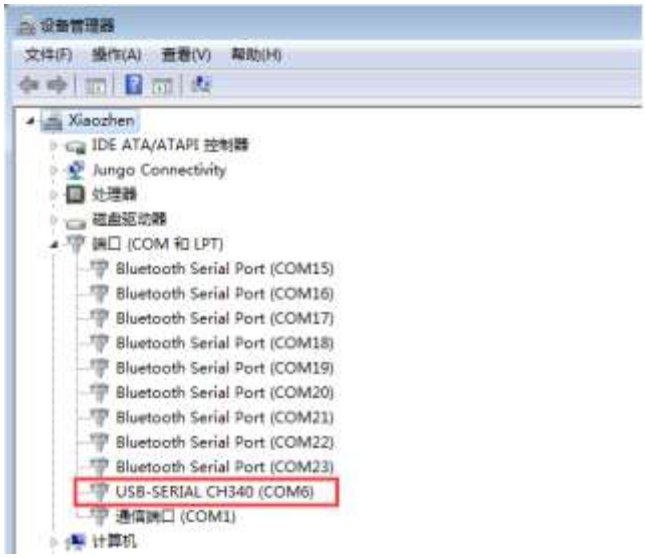


3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.



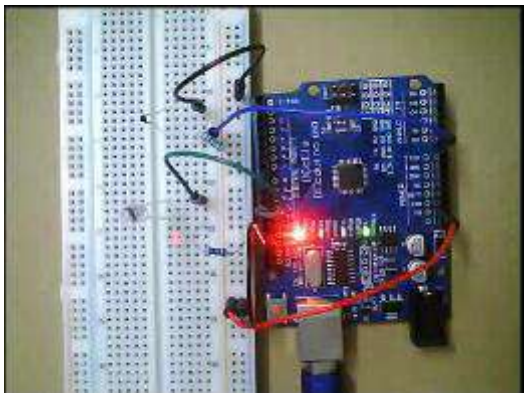
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.

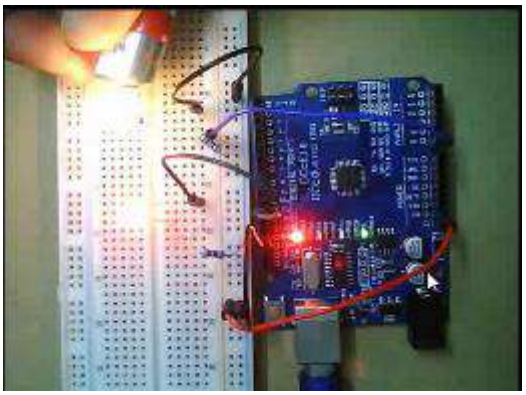


6. After the selection is completed, you need to click “**Upload**” to upload the code to the Arduino UNO board. When the word “**Upload success**” appears in the lower left corner,

the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

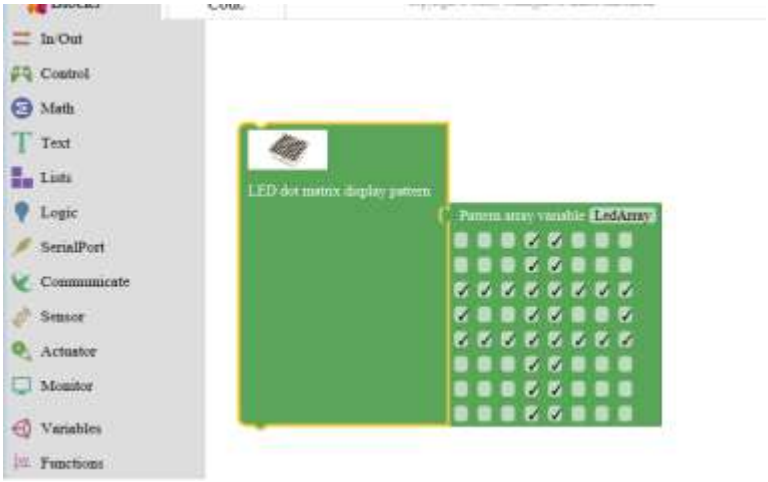
4. After the code is uploaded. When we do not heat the thermistor, the LED extinguish. When we heat the thermistor, the LED will bright, and the brightness of the LED will change with the change of the heat of the thermistor. At the same time, we can open the serial port monitor, and we can also see the change of resistance of photoresistor, as shown in the following figure.





11- 8x8 lattice

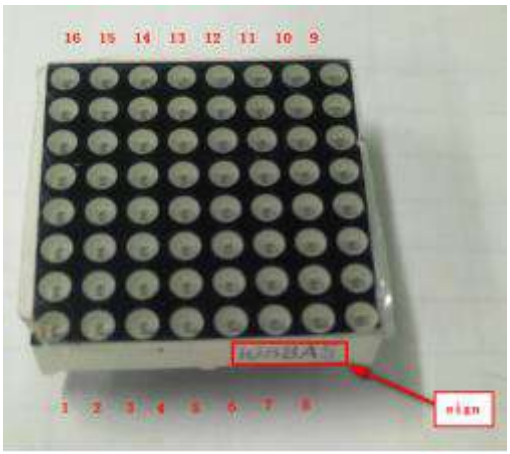
You need to follow the steps below to build blocks.

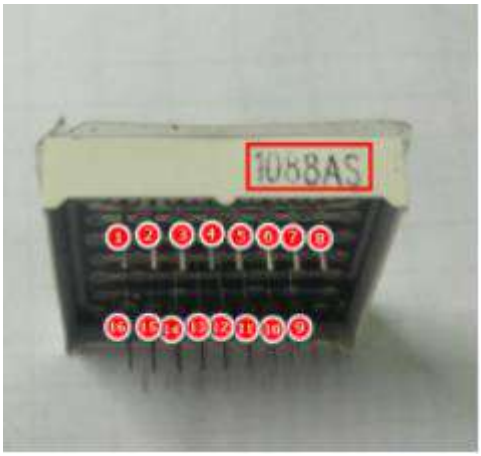


Introduction of 8x8 dot matrix:

The 8x8 lattice is composed of 64 LED, and each LED is placed at the intersection of line and line. When one line is high level(1) and a column is low level(0), the corresponding diode will be bright. If you want to light up the first line, the ninth pin need to high level, and (13, 3, 4, 10, 6, 11, 15, 16) these pins are low level. If you want to light up the first column, the thirteenth pin need low level, and (9, 14, 8, 12, 1, 7, 2, 5) these pins are low level.

Pin identification as shown in the two figures below





List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω resistor *8

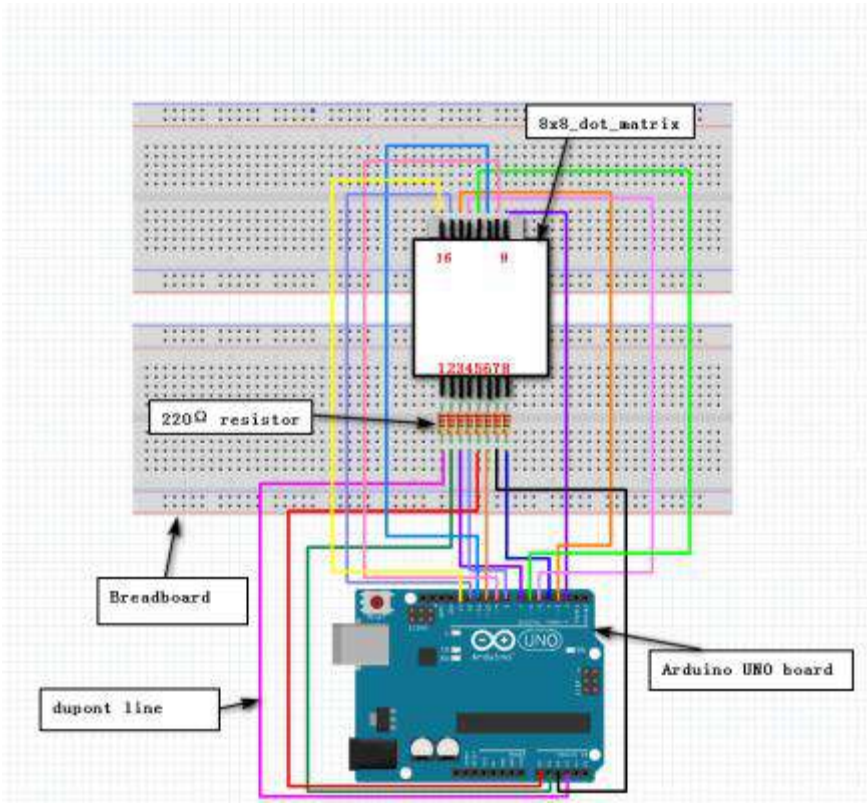
8x8 dot matrixLED*1

Breadboard *1

dupont line *1bunch

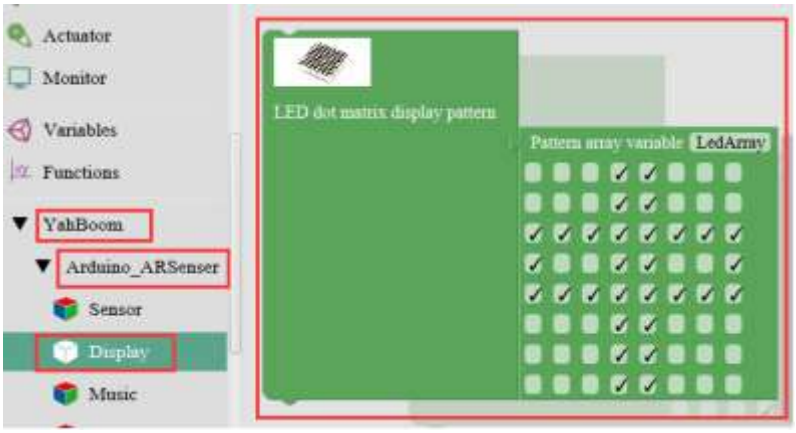
Actual object connection diagram：

We need to connect the circuit as shown in the figure below.

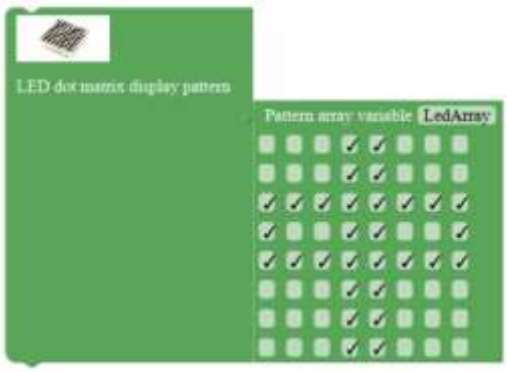


Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

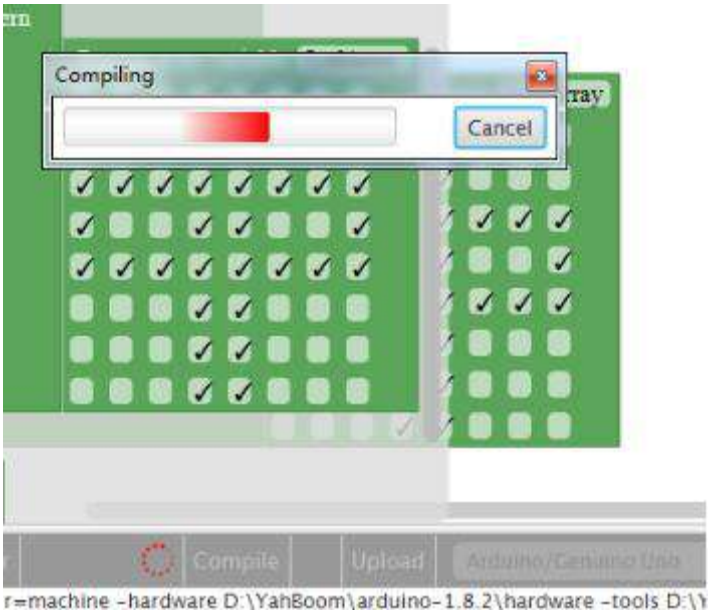


2.You need to combine the selected blocks, as shown in the figure below.

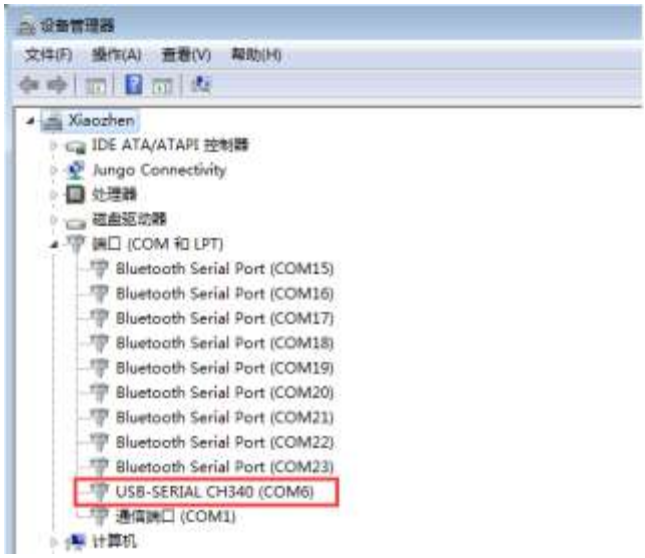


3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

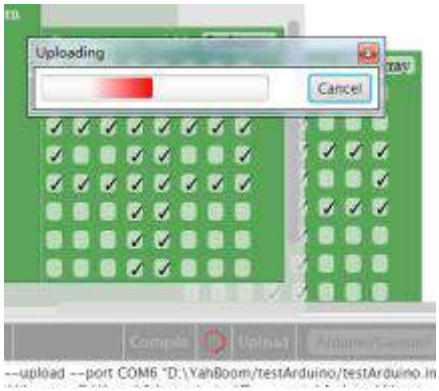
4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.



5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.



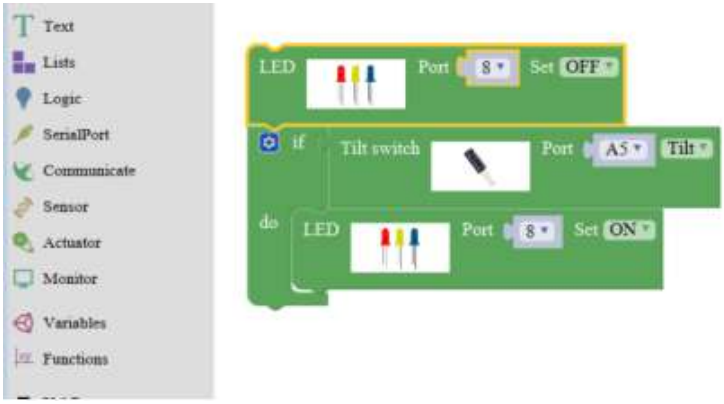
6. After the selection is completed, you need to click “**Upload**” to upload the code to the Arduino UNO board. When the word “**Upload success**” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



7. After the code is uploaded.We can see that the word "中" is displayed on the 8*8 dot matrix.

12-Tilt switch

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω resistor *1

10kΩ resistor *1

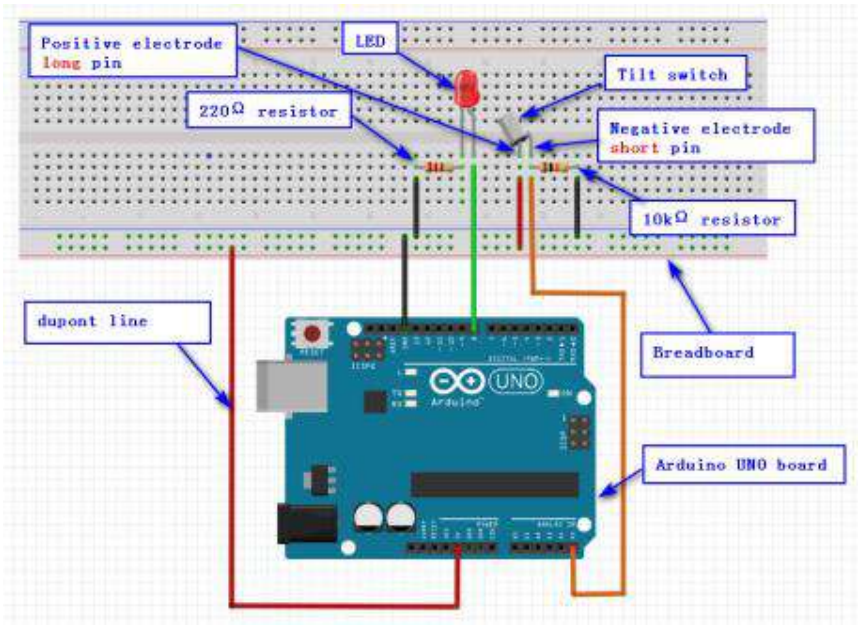
Tilt switch *1

Breadboard *1

Dupont line *1 bunch

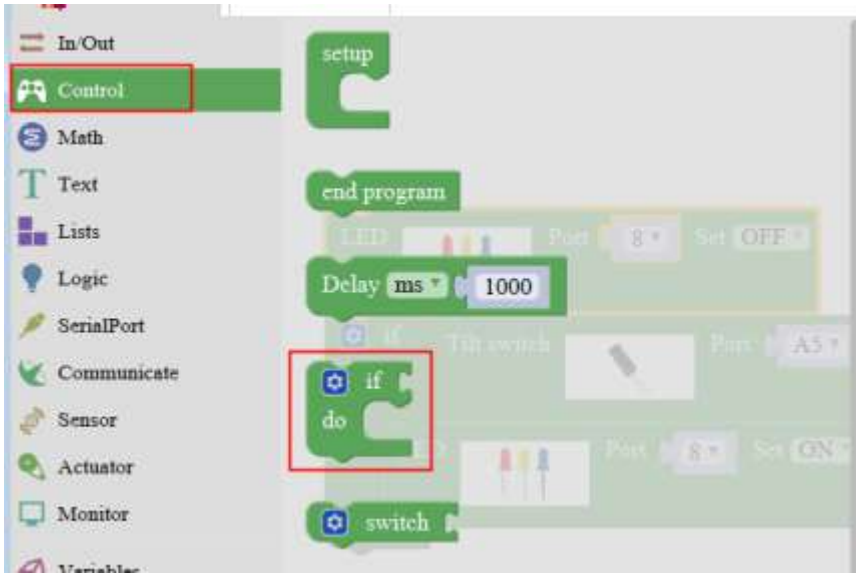
Actual object connection diagram：

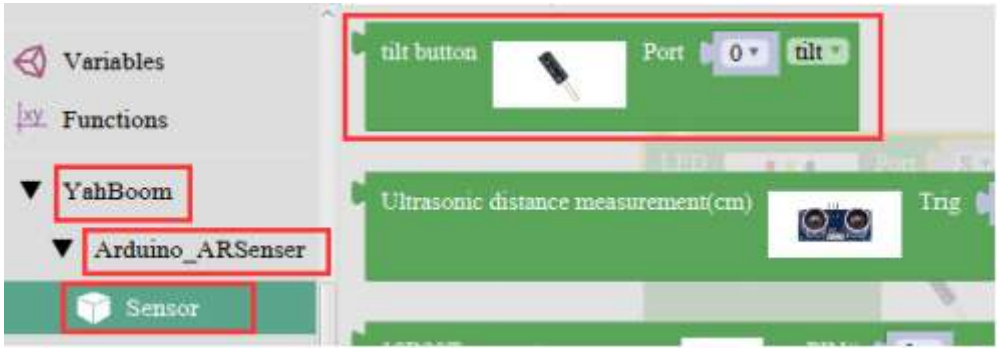
We need to connect the circuit as shown in the figure below.



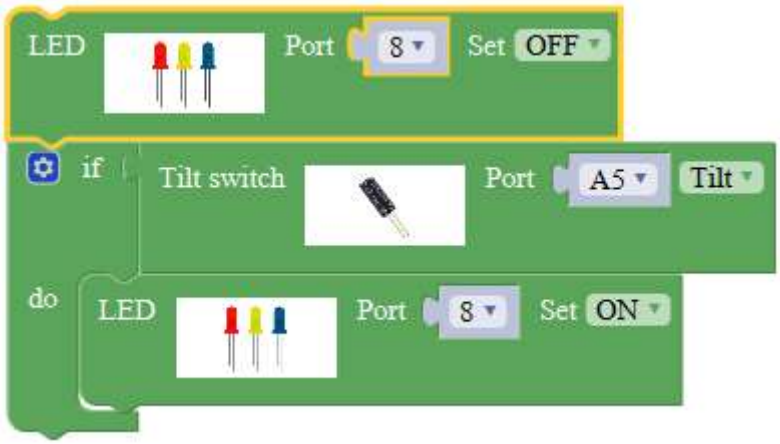
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



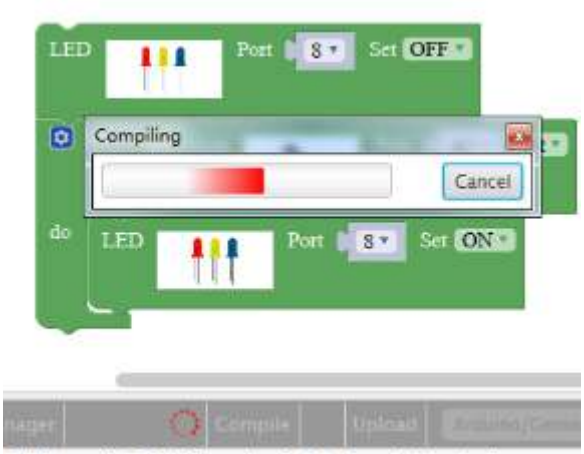


2.You need to combine the selected blocks, as shown in the figure below.

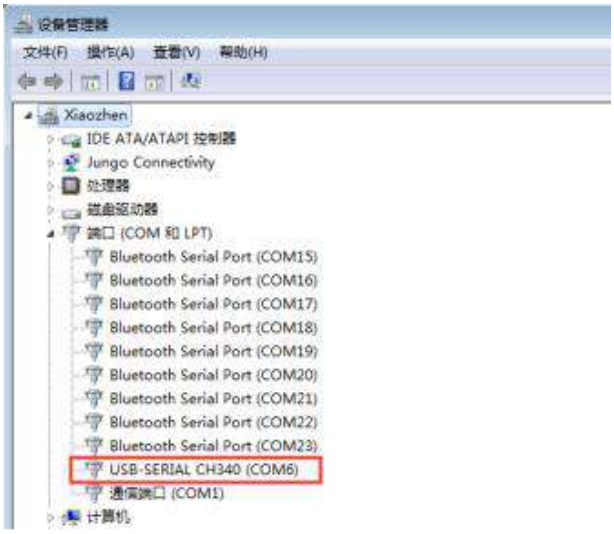


3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

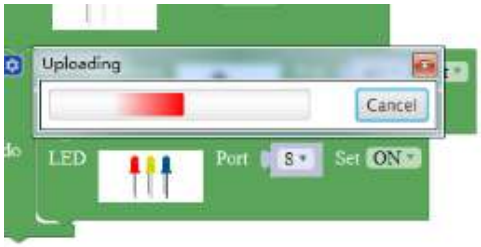
4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.

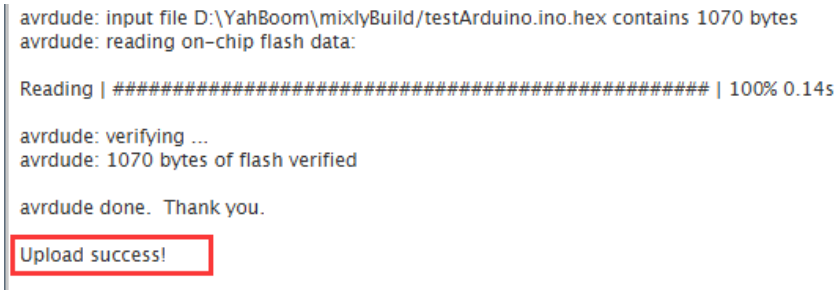


5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.

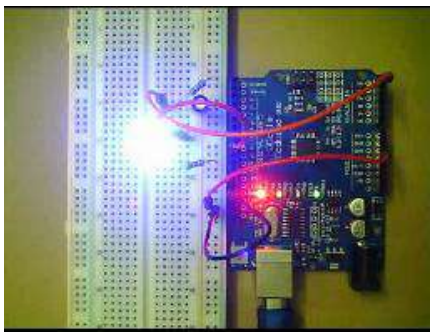


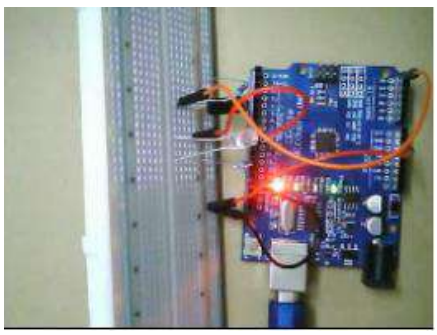
6. After the selection is completed, you need to click "**Upload**" to upload the code to the Arduino UNO board. When the word "**Upload success**" appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.





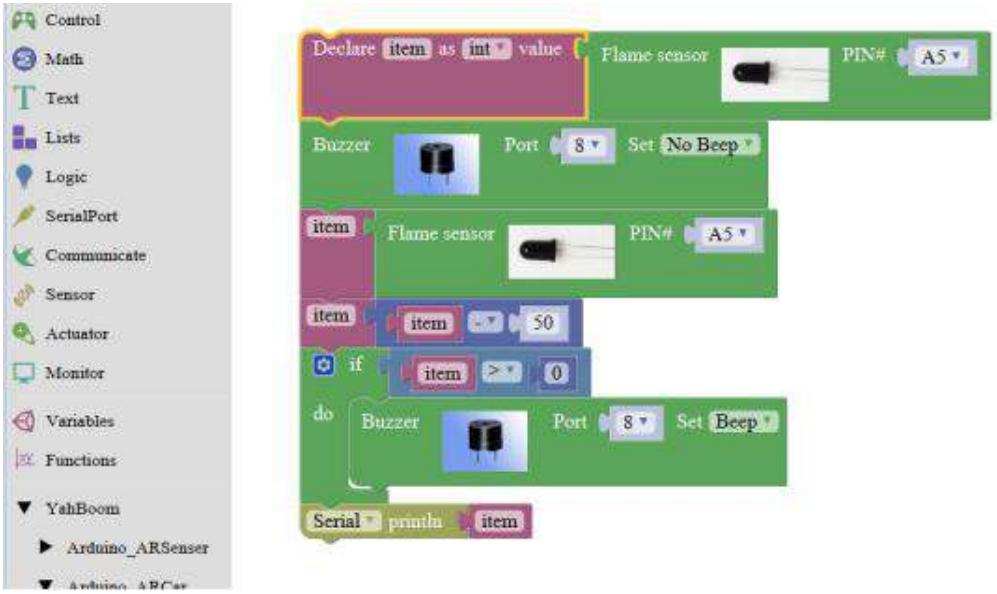
7.After the code is uploaded. The LED lights up when the ball switch is in the horizontal position, and the LED turns off when we put the ball switch in the tilt position.， At the same time, we can open the serial port monitor, we can also see the change of the voltage value at both ends of the ball switch, as shown in the figure below.





13- Fire alarm

You need to follow the steps below to build blocks.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω resistor *1

10kΩ resistor *1

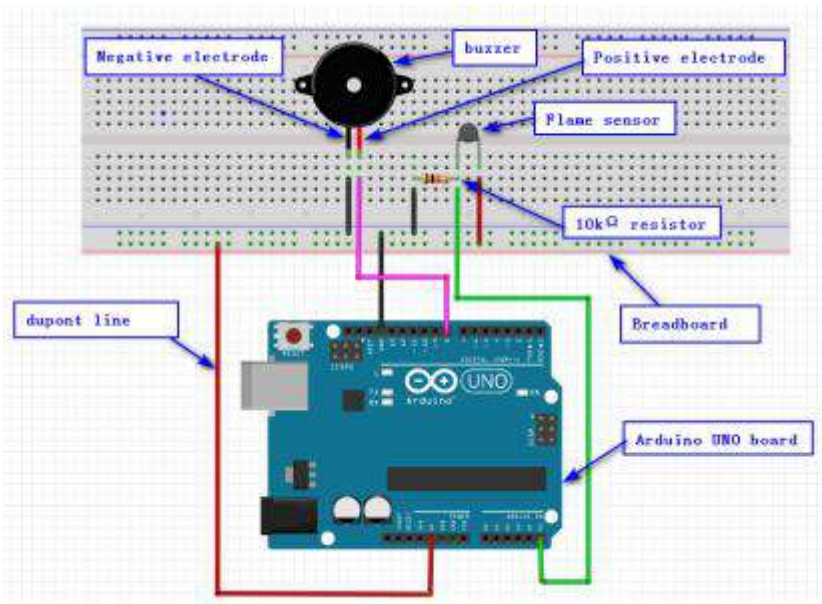
Tilt switch *1

Breadboard *1

Dupont line *1 bunch

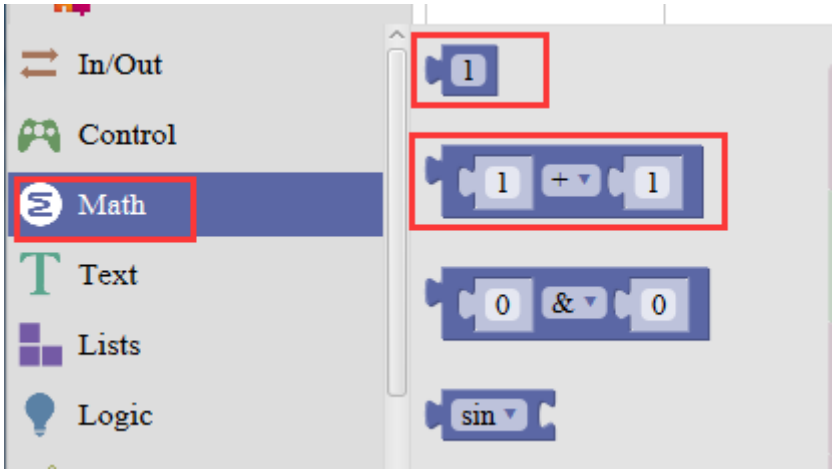
Actual object connection diagram：

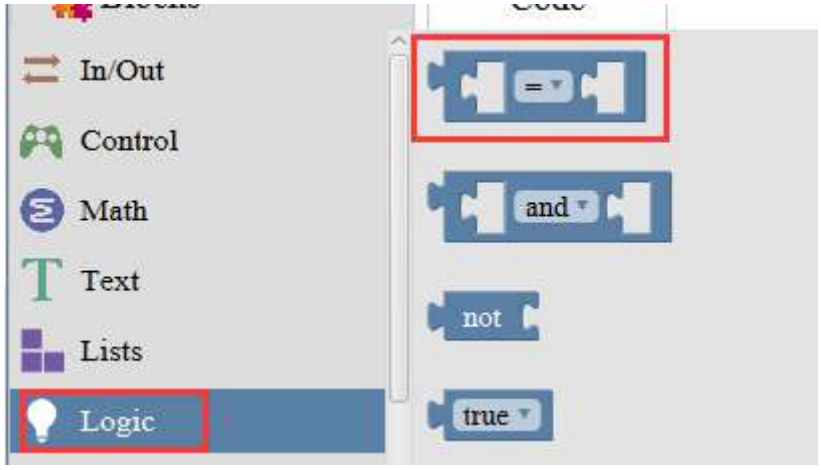
We need to connect the circuit as shown in the figure below.

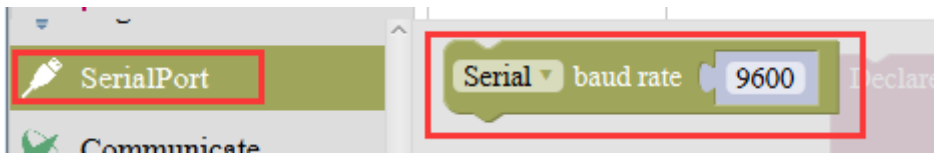


Steps of experiment:

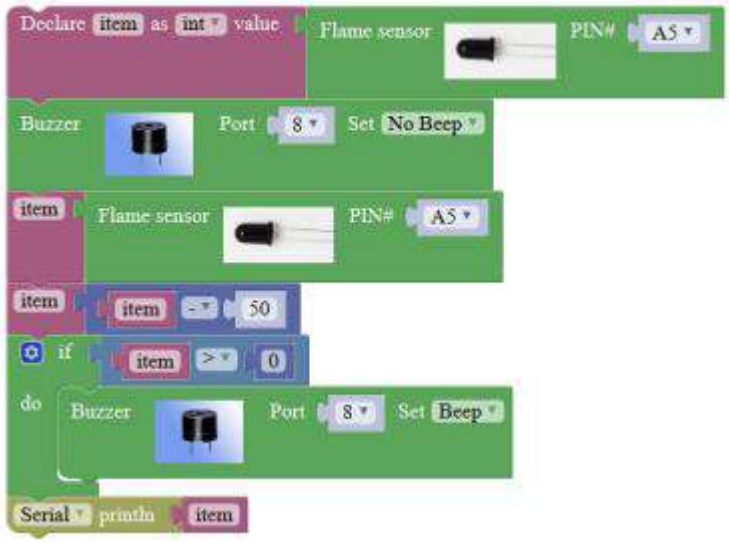
1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.





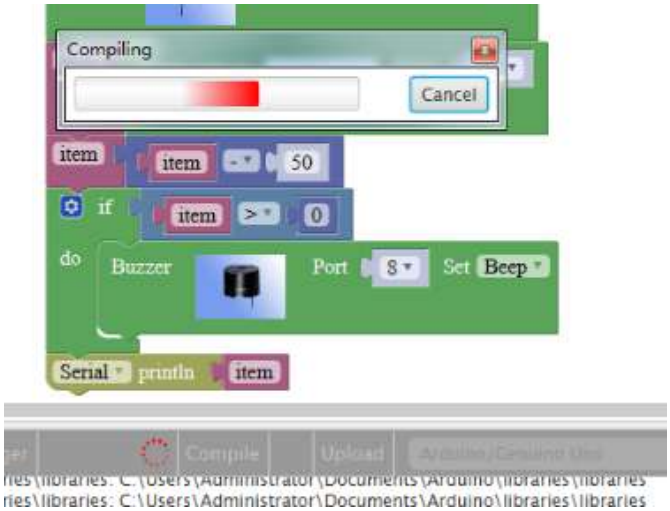


2.You need to combine the selected blocks, as shown in the figure below.

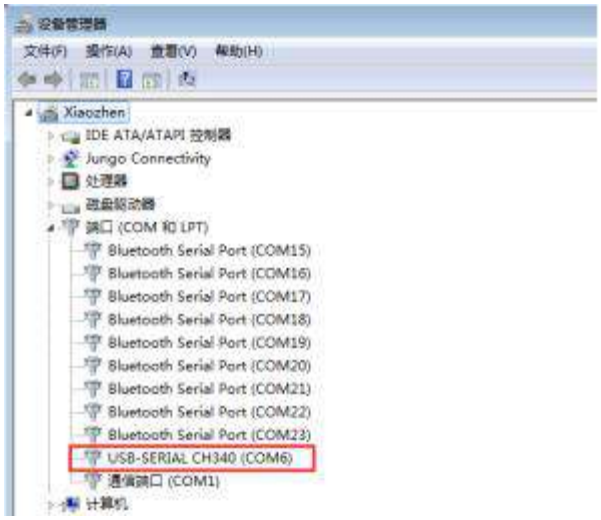


3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

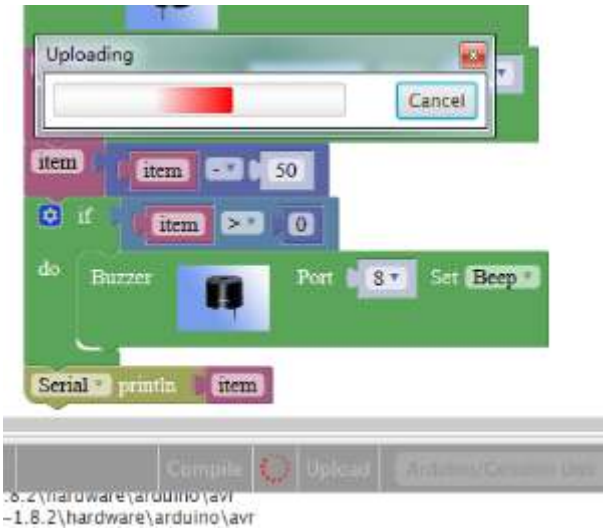
4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.



5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.



6. After the selection is completed, you need to click "**Upload**" to upload the code to the Arduino UNO board. When the word "**Upload success**" appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



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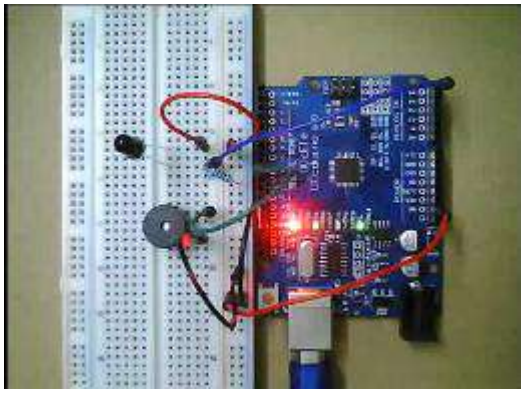
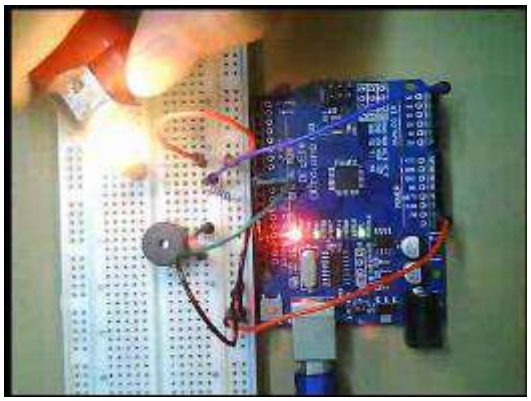
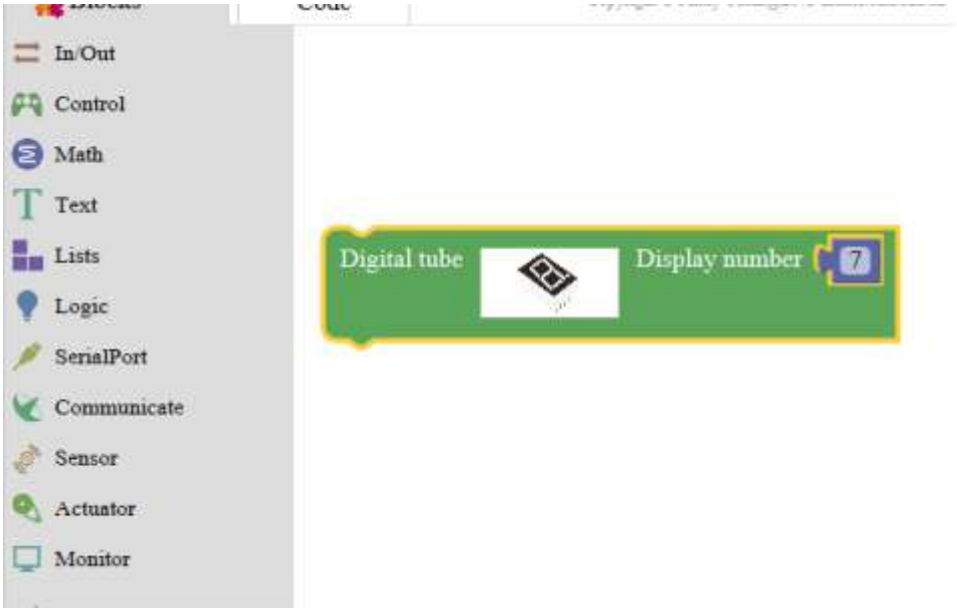
7.After the code is uploaded. When there is no fire source approaching, the circuit is normal. When there is a fire source approaching, the buzzer will make a sound to indicate the alarm. We can also open the serial monitor to observe view the simulated voltage values, as shown in the figure below.





14- Nixie tube

Follow the steps to splice the building blocks ：



Introduction to digital tube:

Nixie tube is a semiconductor luminescent device, its basic unit is a light-emitting diode. It is divided into 7-segment Nixie tube and 8-segment Nixie tube. 8-segment Nixie tube more than 7-segment Nixie tube a light-emitting diode unit (more than a decimal point), this experiment we use the 8-segment Nixie tube. The actual object is shown below.

According to the light-emitting diode unit connection mode, it is divided into anode Nixie tubes and cathode Nixie tubes.

Anode Nixie tubes that connects the anodes of all light-emitting diodes together to form a common anode (COM). The common pole (COM) shall be connected to +5V when the common anode digital tube is applied. When the cathode of a certain field of light-emitting diode is low , the corresponding field will be light up. When the cathode of a field is high, the field does not light up.

Cathode Nixie tubes that connects the cathodes of all light-emitting diodes together to form a common cathode (COM). The common pole COM shall be connected to GND when the common cathode digital tube is applied. When the anode of a certain field of light-emitting diode is high , the corresponding field will be light up. When the anode of a field is low, the field does not light up.

List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω resistor *8

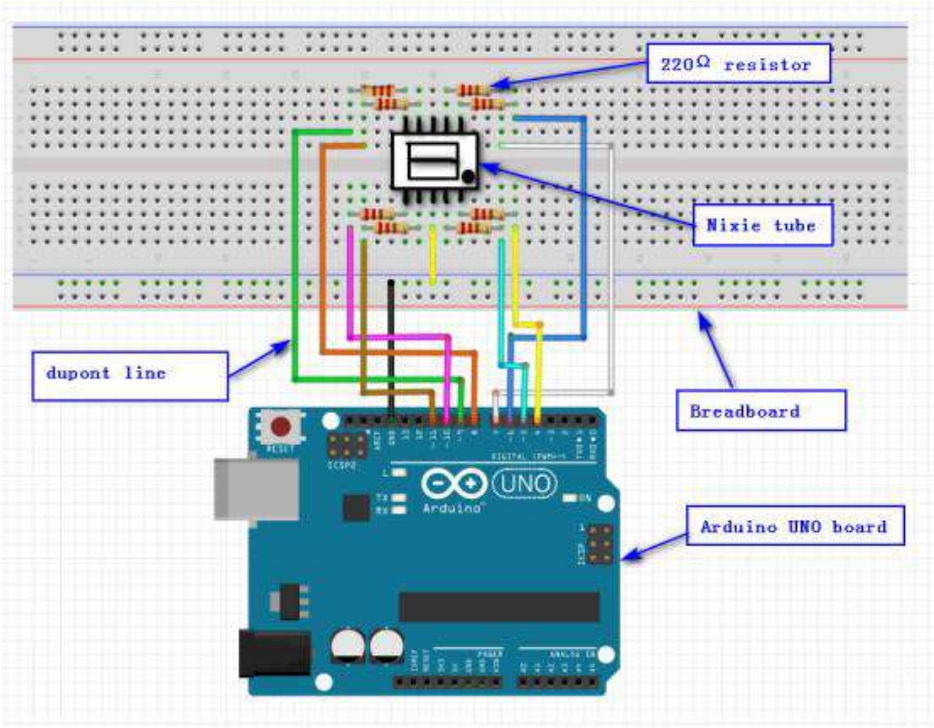
8-segment digital tube *1

Breadboard *1

Dupont line *1bunch

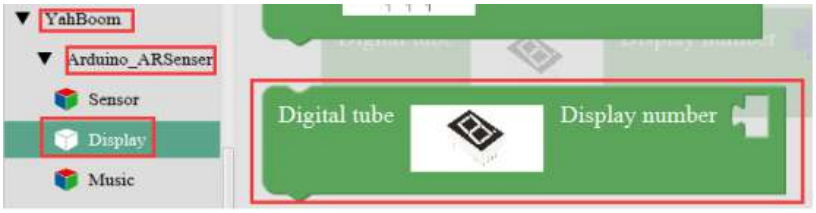
Actual object connection diagram：

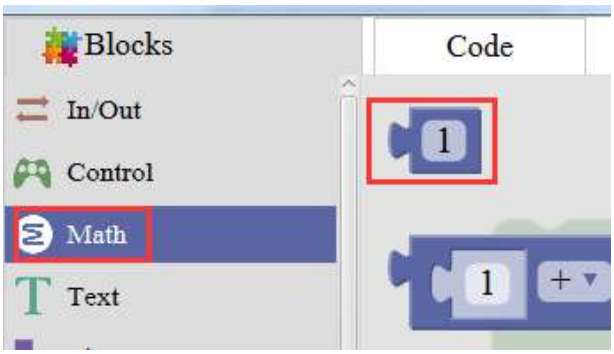
We need to connect the circuit as shown in the figure below.



Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

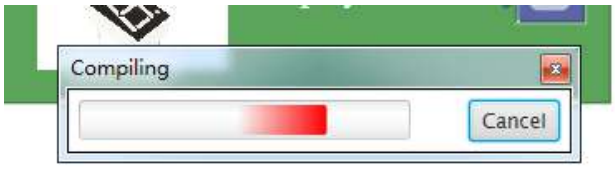




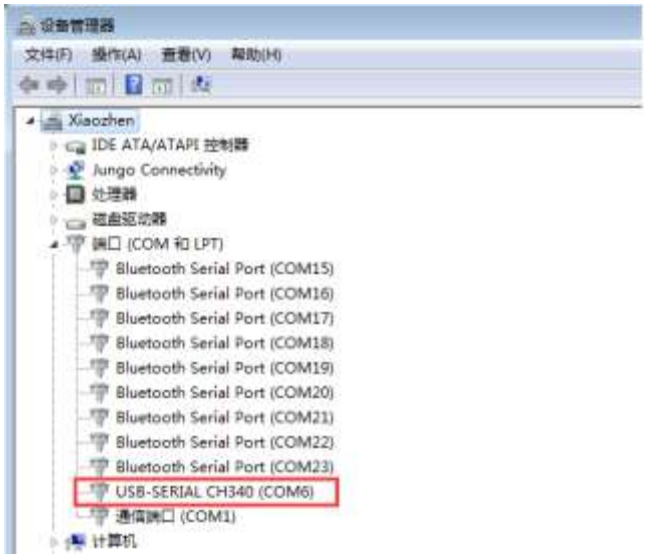
2.You need to combine the selected blocks, as shown in the figure below.

3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

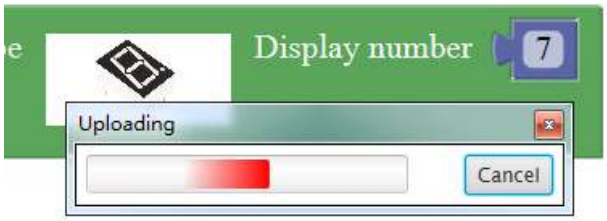
4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.

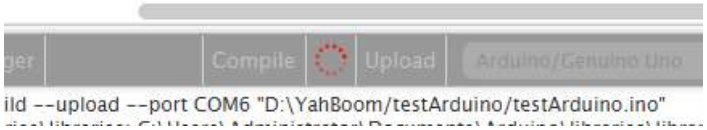


5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.



6. After the selection is completed, you need to click "**Upload**" to upload the code to the Arduino UNO board. When the word "**Upload success**" appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

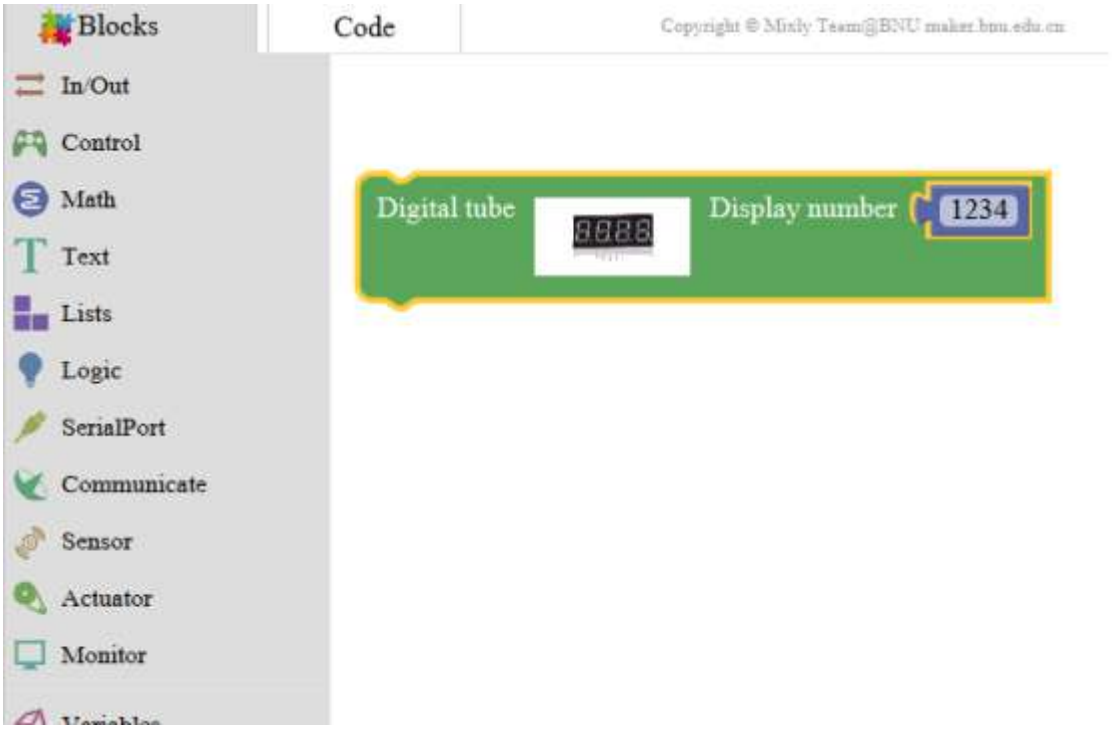




7. After the code is uploaded. We can see that the number 7 is displayed on the Nixie tube.

15- Four bit nixie tube

You need to follow the steps below to build blocks.



Introduction to digital tube:

Nixie tube is a semiconductor luminescent device, its basic unit is a light-emitting diode. According to the number of digital tube is divided into 7-segment Nixie tube and 8-segment Nixie tube. 8-segment Nixie tube more than 7-segment Nixie tube a light-emitting diode unit (more than a decimal point), this experiment use the8-segment Nixie tube.The actual object is shown below.

According to the light-emitting diode unit connection mode, it is divided into anode Nixie tubes and cathode Nixie tubes.

Anode Nixie tubes that connects the anodes of all light-emitting diodes together to form a common anode (COM). The common pole COM shall be connected to +5V when the common anode digital tube is applied. When the cathode of a certain field of light-emitting diode is low , the corresponding field will be light up. When the cathode of a field is high, the field does not light up.

Cathode Nixie tubes that connects the cathodes of all light-emitting diodes together to form a common cathode (COM). The common pole COM shall be connected to GND when the common cathode digital tube is applied. When the anode of a certain field of light-emitting diode is high , the corresponding field will be light up. When the anode of a field is low, the field does not light up.

List of components required for the experiment:

Arduino UNO board *1

USB cable *1

220Ω resistor *8

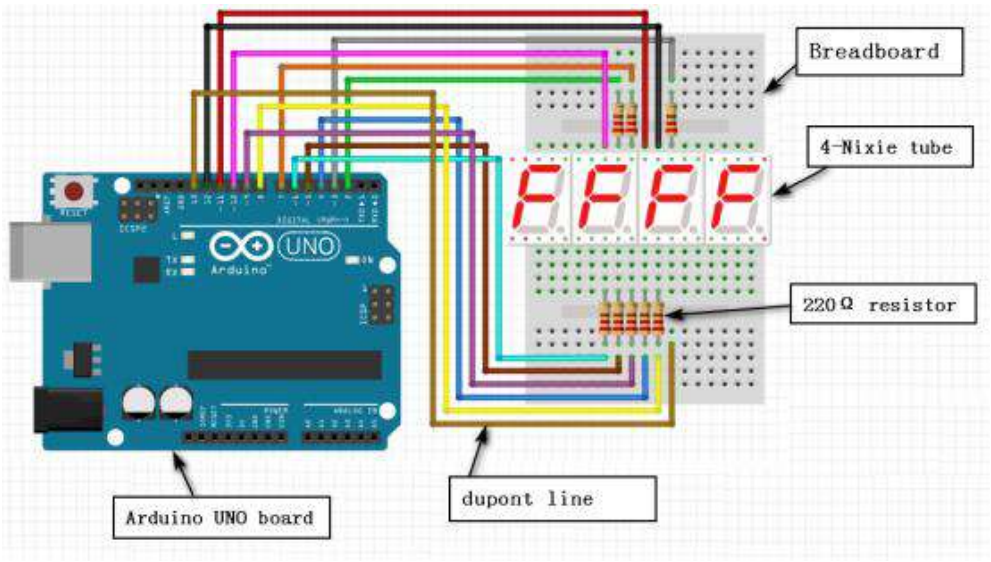
4bit 8-segment digital tube *1

Breadboard *1

dupont line *1bunch

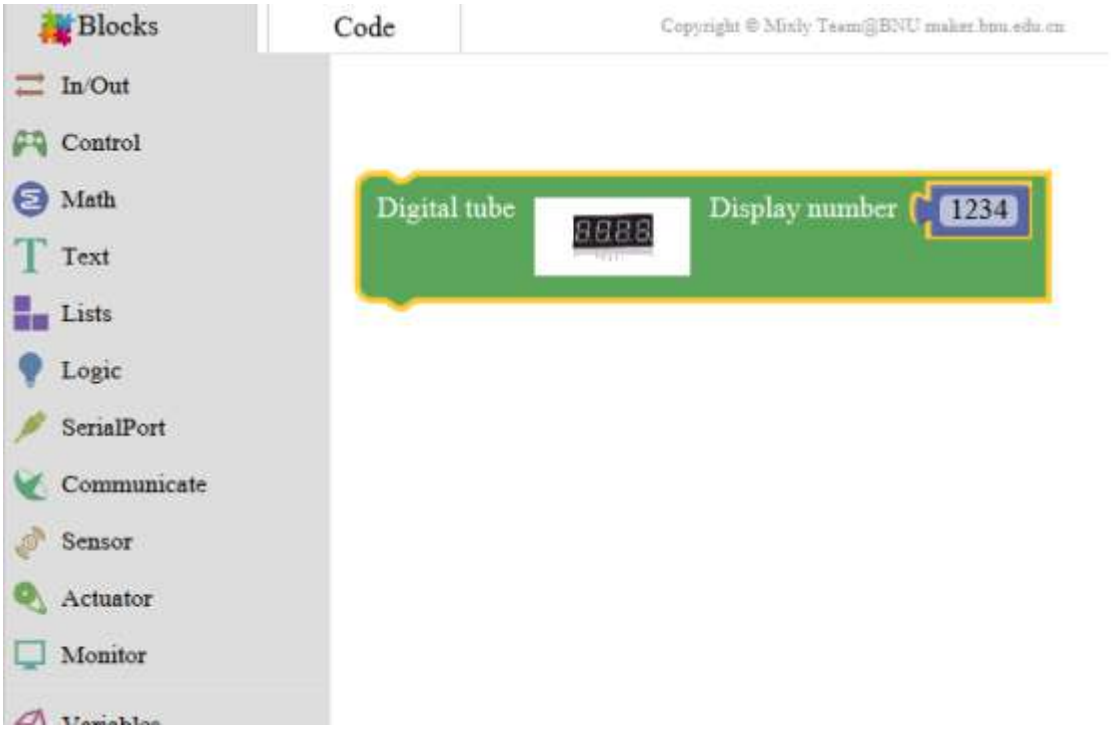
Actual object connection diagram：

We need to connect the circuit as shown in the figure below.



Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

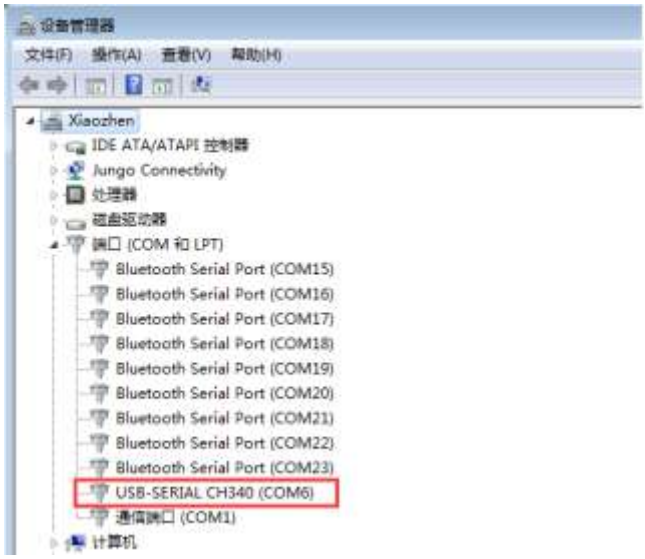


2.You need to combine the selected blocks, as shown in the figure below.

3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.

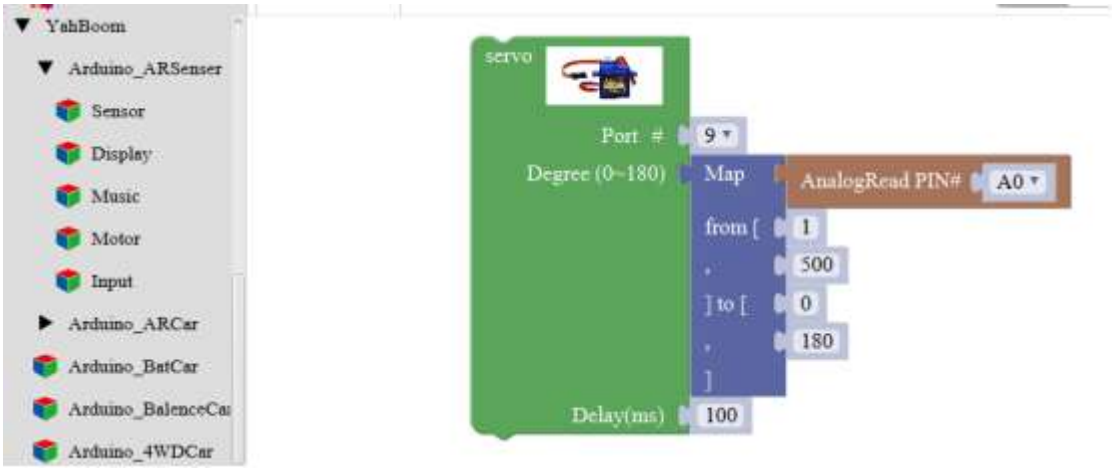


6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

7. After the code is uploaded. We can see that the number “1234” is displayed on the Nixie tube.

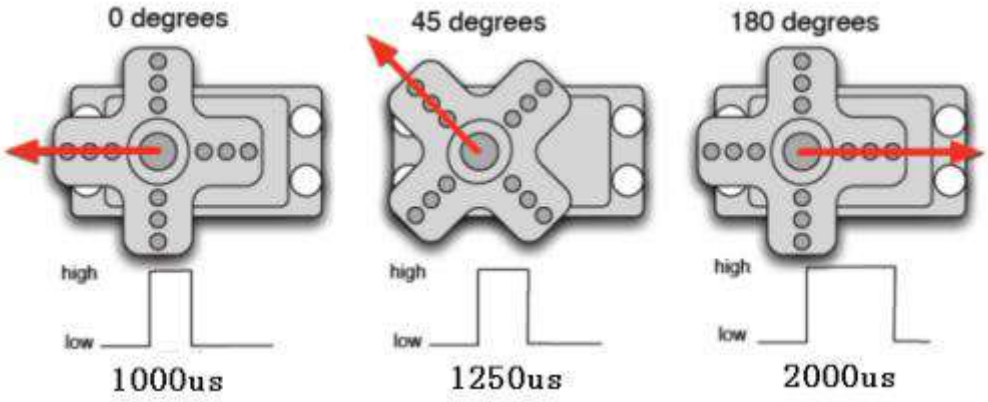
16-Servo control

You need to follow the steps below to build blocks.



About the servo：

The actual object is shown below. Servo rotation angle is by adjusting the duty ratios of PWM (pulse width modulation) signal. The standard PWM (pulse width modulation) signal has a fixed period of 20ms (50Hz). Theoretically, pulse width distribution should be between 1 ms to 2 ms, but in fact between pulse width can be 0.5 ms and 2.5 ms. Pulse width and the servo rotation angle 0°～180° corresponds, as shown in the figure below.



Servo have many specifications, but all of the servo possess external three lines, with brown, red, orange, three kinds of color to distinguish. Due to brand is different, color is different, brown for the grounding line, red for positive line, orange for signal lines.

Note: Due to brand is different, for the same signal, different brands of servo rotation angle will be different.

List of components required for the experiment:

Arduino UNO board *1

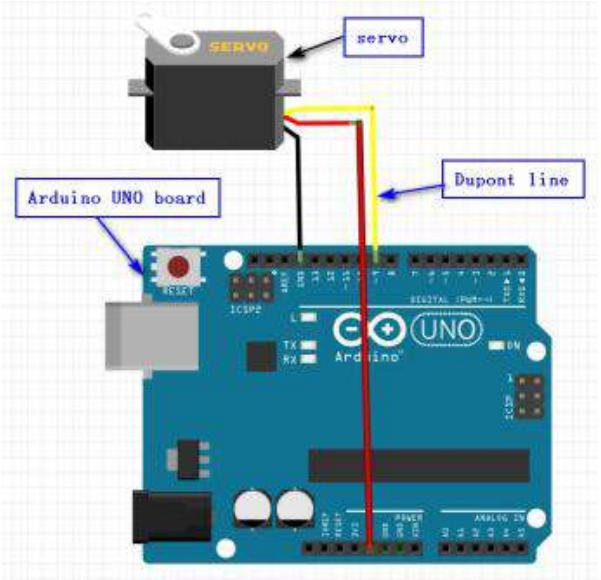
USB cable *1

Servo *1

Dupont line *1 bunch

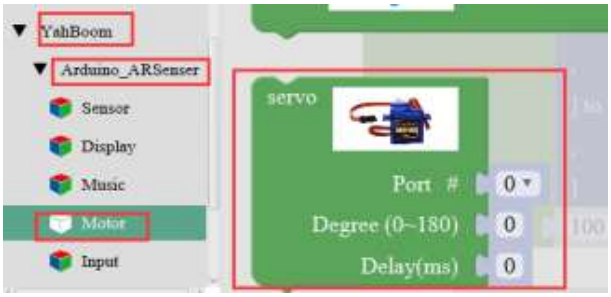
Actual object connection diagram：

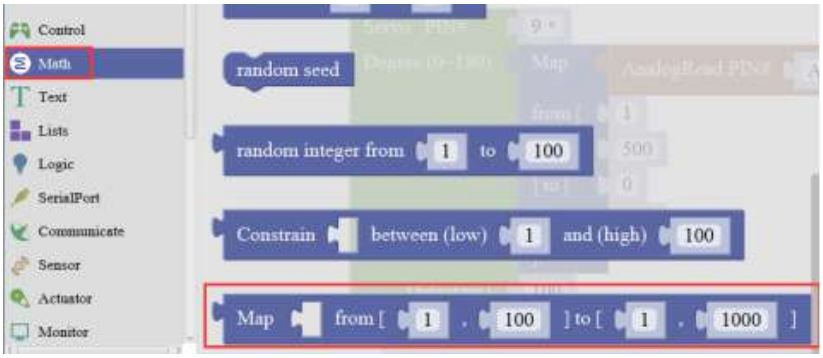
We need to connect the circuit as shown in the figure below.



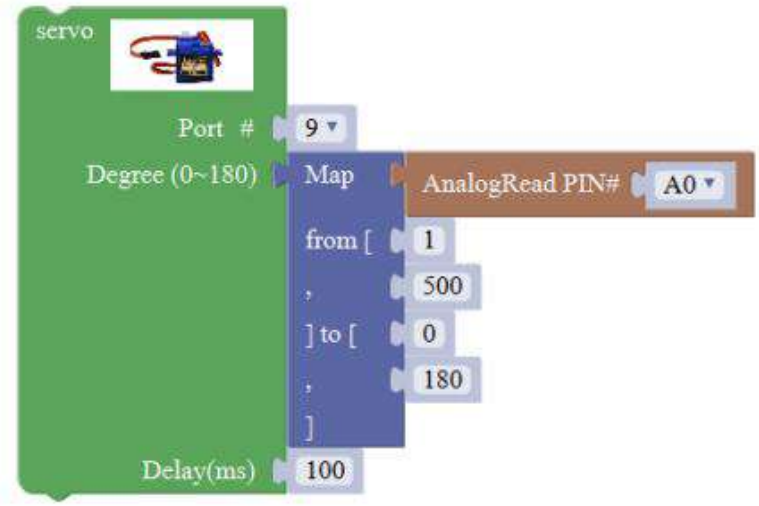
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



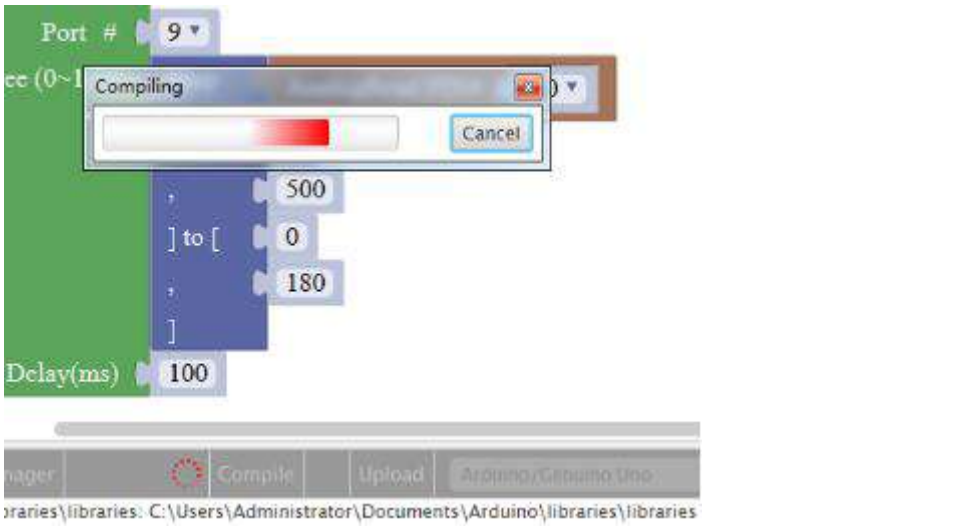


2.You need to combine the selected blocks, as shown in the figure below.

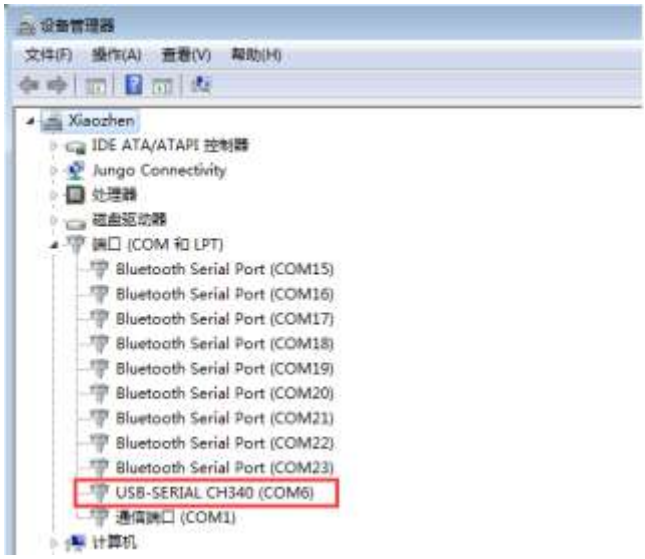


3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

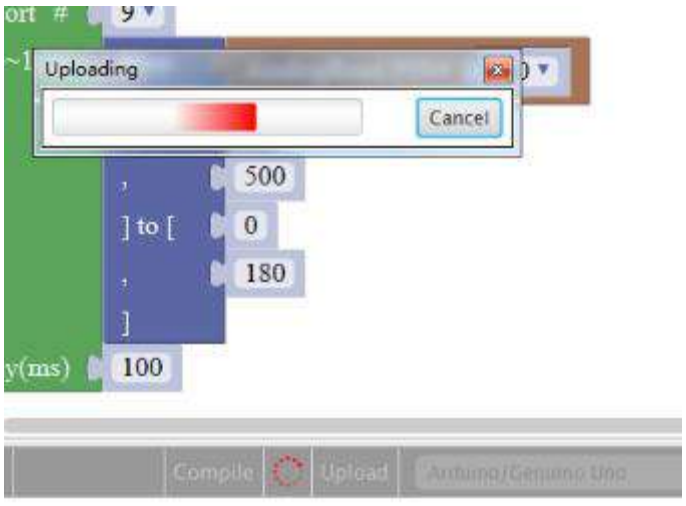
4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.



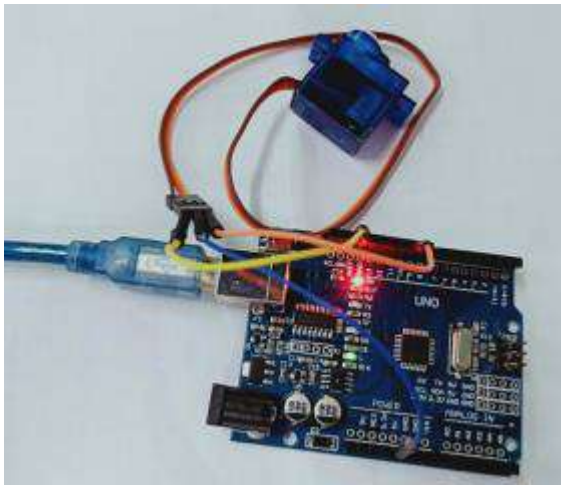
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.



6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

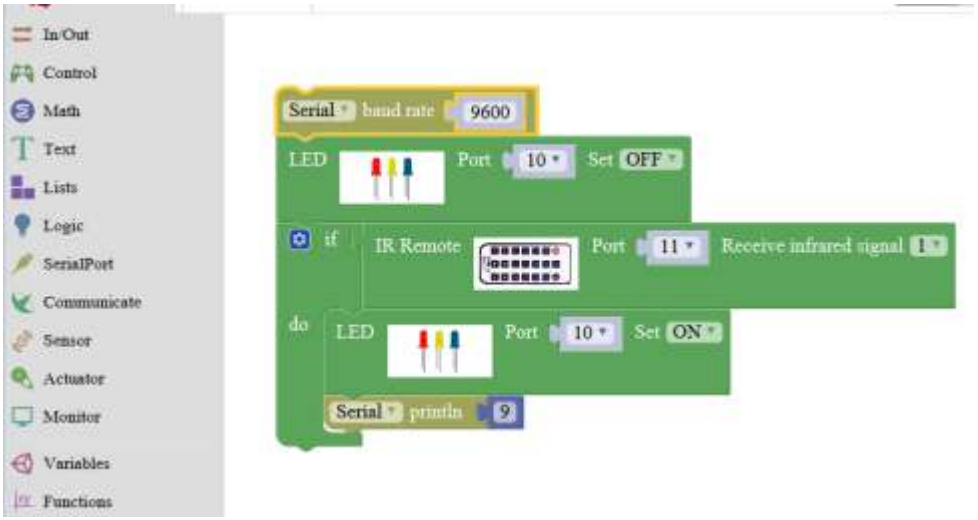


7.After the code is uploaded, we can see that the servo is turned to the angle set in the code.



17- IR control

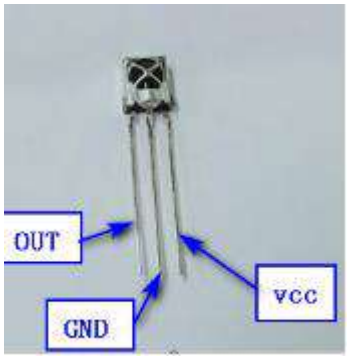
You need to follow the steps below to build blocks.



About the infrared remote control：

The signal from the IR remote controller is a series of binary pulse codes. In order to protect it from other infrared signals during wireless transmission. It is modulated on a specific carrier frequency ,and then transmitted by infrared emission sensor. The infrared receiving device need to filter out other waveform and receive the signal of the specific frequency and restore it to binary pulse code, this process is called demodulation.

The IR receiver sensor converts the optical signal emitted by the infrared emission sensor to a weak electrical signal. These signals are restored to the original encode by various circuits, finally outputs the signal to the control circuit.



List of components required for the experiment:

Arduino UNO board *1

USB cable *1

IR receiver sensor *1

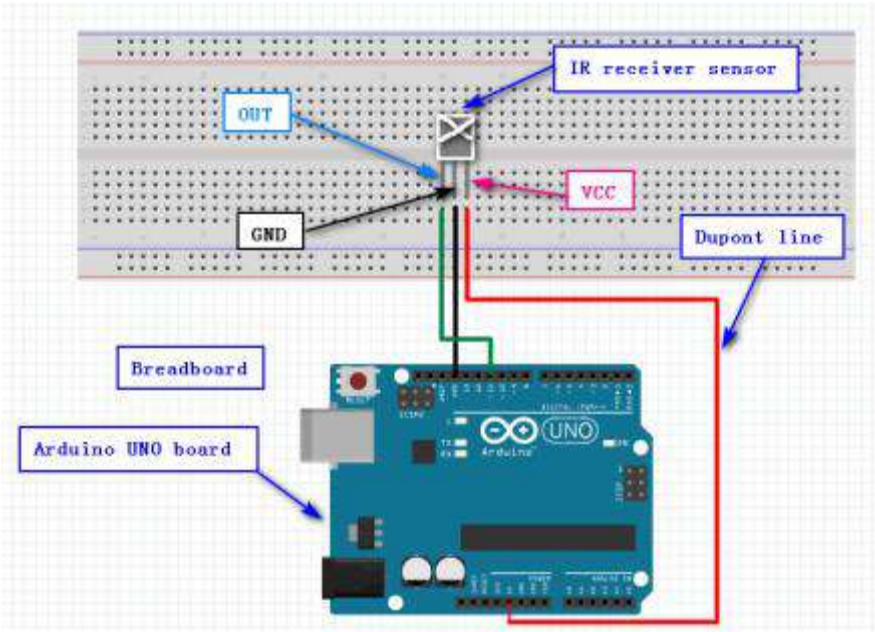
IR remote controller *1

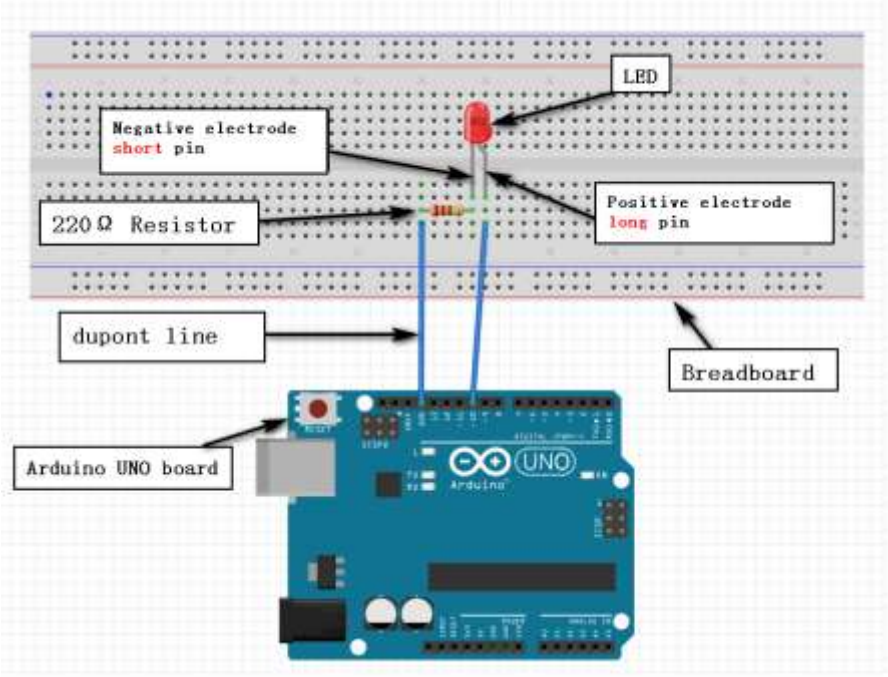
Breadboard *1

Dupont line *1 bunch

Actual object connection diagram：

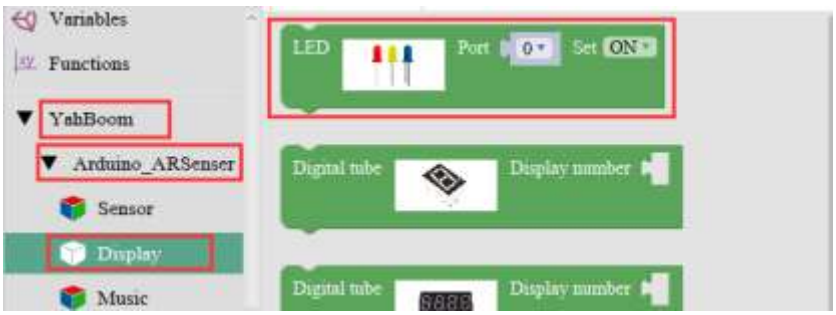
We need to connect the circuit as shown in the figure below.

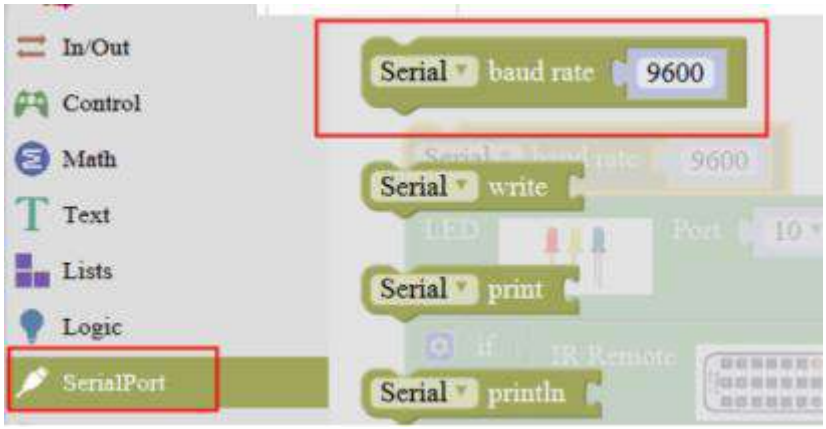


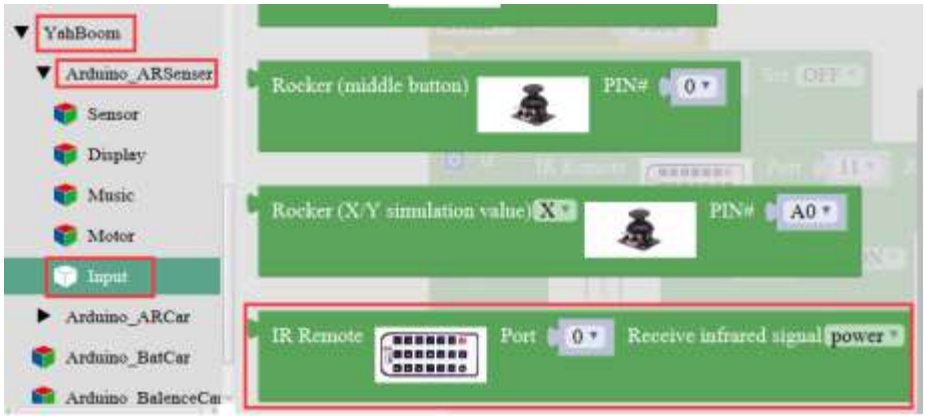


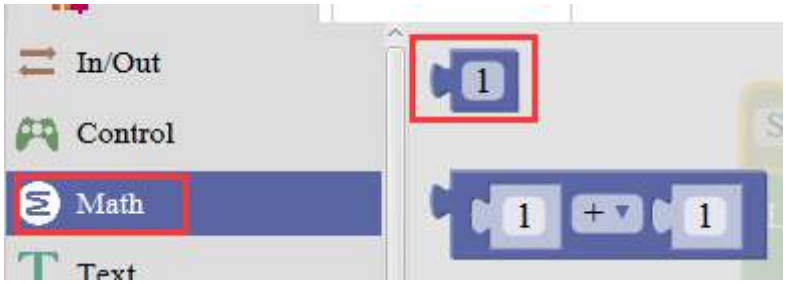
Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.

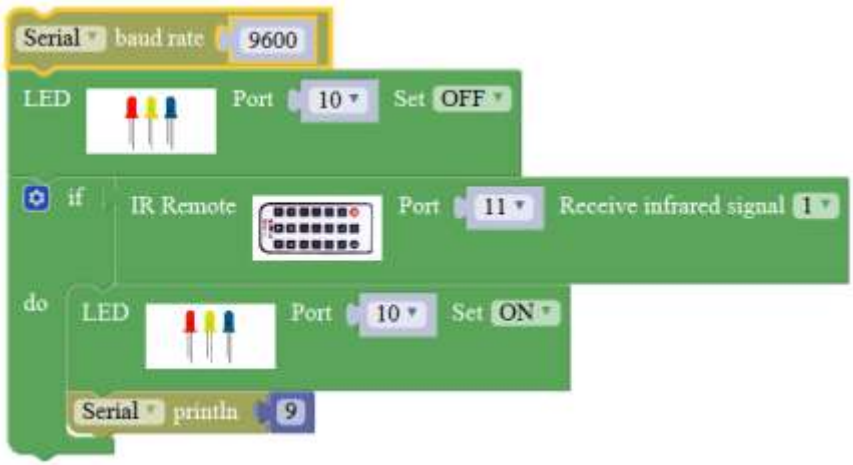






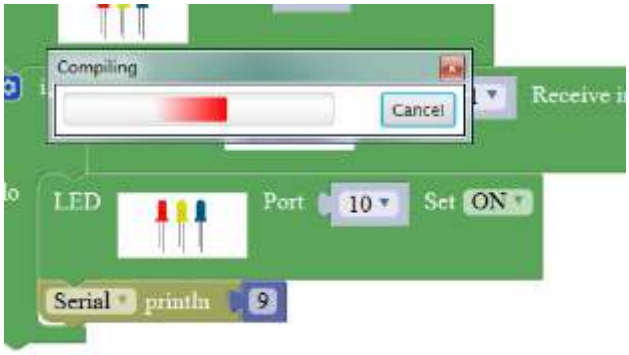


2.You need to combine the selected blocks, as shown in the figure below.

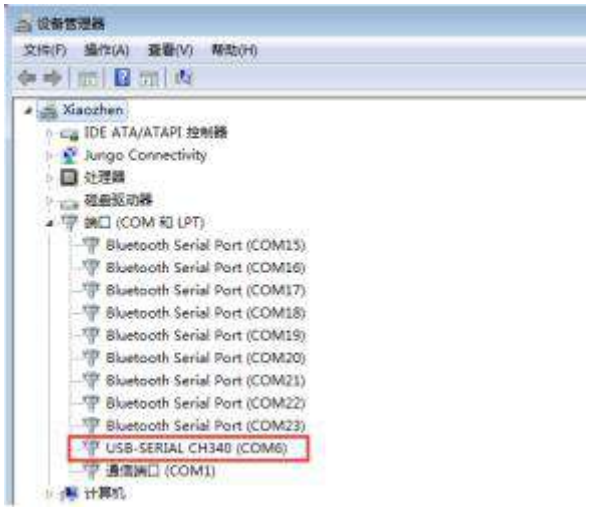


3.You need to you need to click “Compile”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "Compile success!" will appear in the lower left corner, indicating that you have successfully compiled the program.

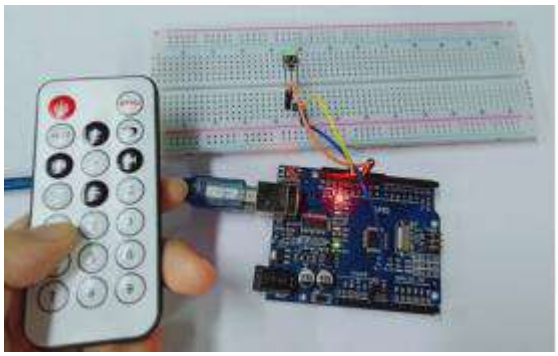


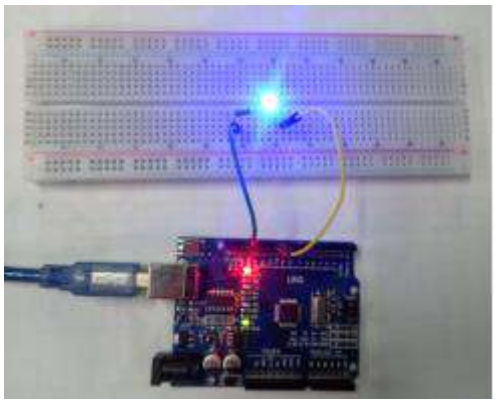
5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and Arduino/Genuino Uno. As shown in the figure below.



6. After the selection is completed, you need to click “Upload” to upload the code to the Arduino UNO board. When the word “Upload success” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.

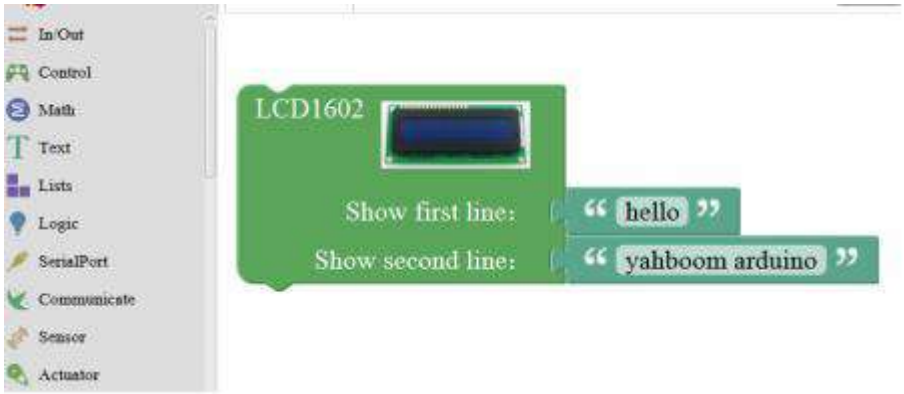
7. After the code is uploaded. When we press the butto“1”on the infrared remote controller, we can see that led light up.





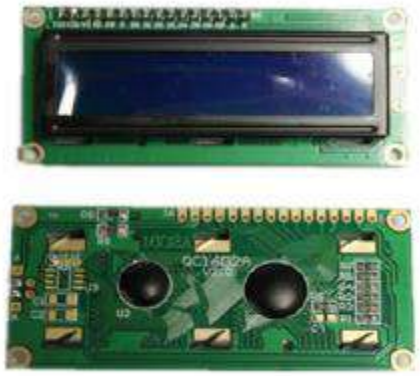
18-1602LCD

You need to follow the steps below to build blocks.



Introduction of 1602：

The actual object is shown below.



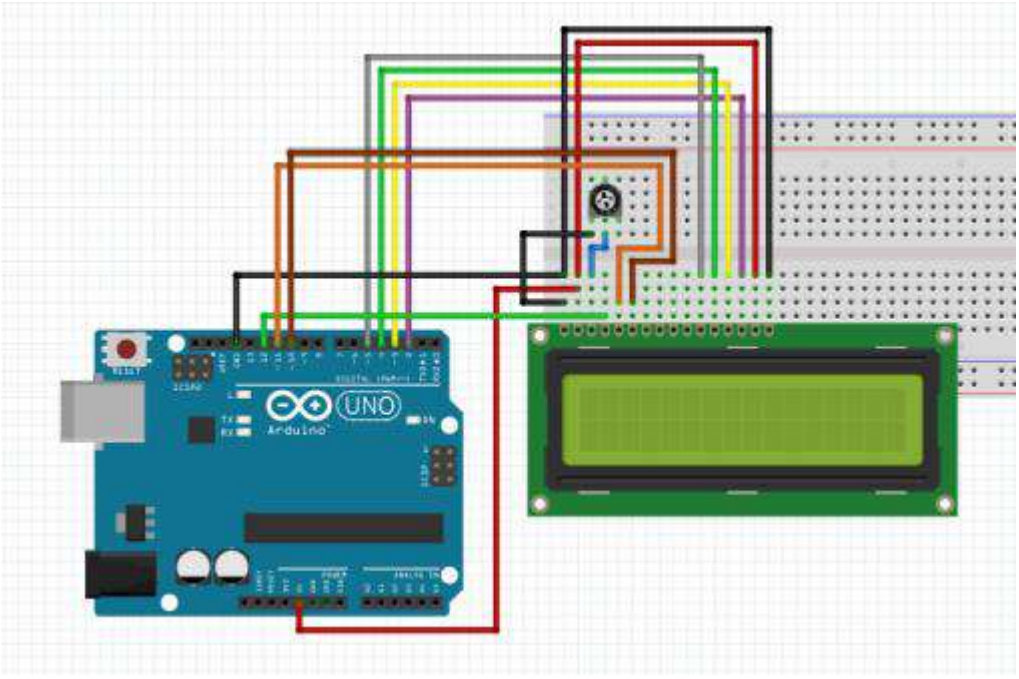
Main specification of 1602LCD:
Display capacity: 16 x 2 characters;
Working current: 2.0mA
Operating voltage: 5.0v
Size of character: 2.95 * 4.35 (W * H) mm.
1602 possess 16 pins:
Pin 1: VSS is ground power
Pin 2: VDD is connected to 5V positive power supply
Pin 3: V0 is the LCD contrast adjustment pin, which can be adjusted by a 10K adjustable resistor.

Pin 4: RS is the register selection pin, data register is selected at high voltage and instruction register is selected at low voltage.
Pin 5: R/W is the signal line for reading and writing. Reading operation is carried out at high level and writing operation is carried out at low level.

Pin 6: E pin is the enable pin. When this pin changes from high level to low level, the LCD module executes the command.
Pin 7 ~ Pin 14: D0 ~ D7 is 8-bit two-way data line.
Pin 15: power positive pole of backlight.
Pin 16: power negative pole of backlight.

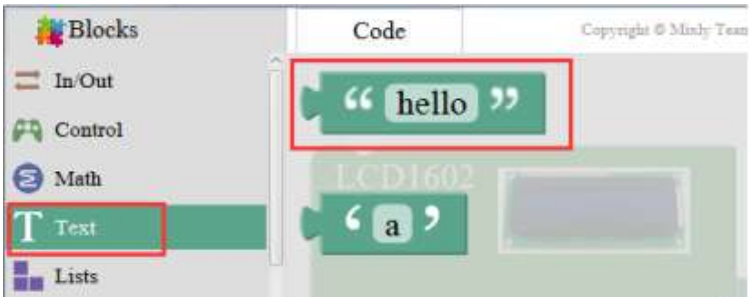
Actual object connection diagram：

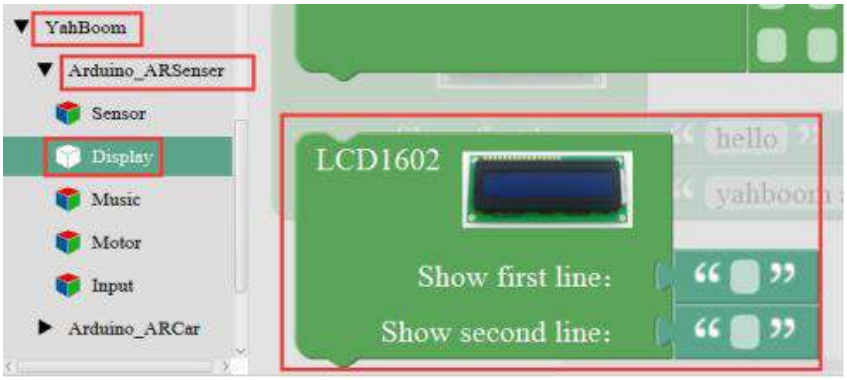
We need to connect the circuit as shown in the figure below.



Steps of experiment:

1.You need to choose the building blocks which you need for this experiment, as shown in the figure below.



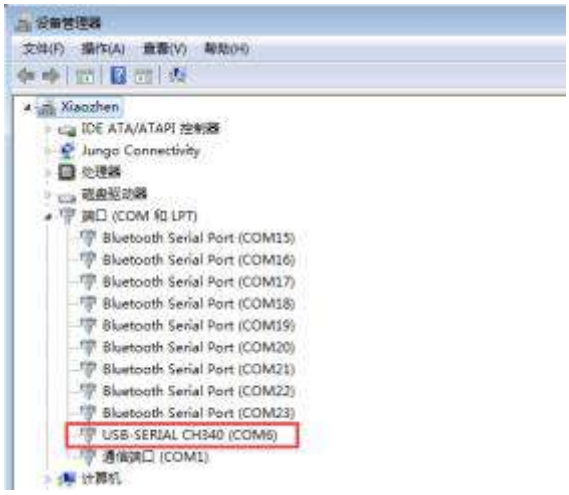


2.You need to combine the selected blocks, as shown in the figure below.

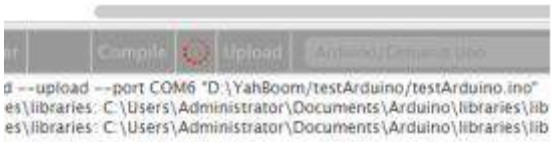
3.You need to you need to click “**Compile**”. and wait for the completion of the compiler, the following box will prompt the compiler successfully, if prompt the compile failure is the problem of building block splicing.

4. After the compilation is completed, the word "**Compile success!**" will appear in the lower left corner, indicating that you have successfully compiled the program.

5. In the menu bar of Mixly, we need to select the port that the serial number displayed by the device manager (for exmaple:COM6) and **Arduino/Genuino Uno.** As shown in the figure below.



6. After the selection is completed, you need to click “**Upload**” to upload the code to the Arduino UNO board. When the word “**Upload success**” appears in the lower left corner, the code has been successfully uploaded to the Arduino UNO board, as shown in the figure below.



7.After the code is uploaded. We can see that the hello yahboom arduino is shown on the LCD1602.