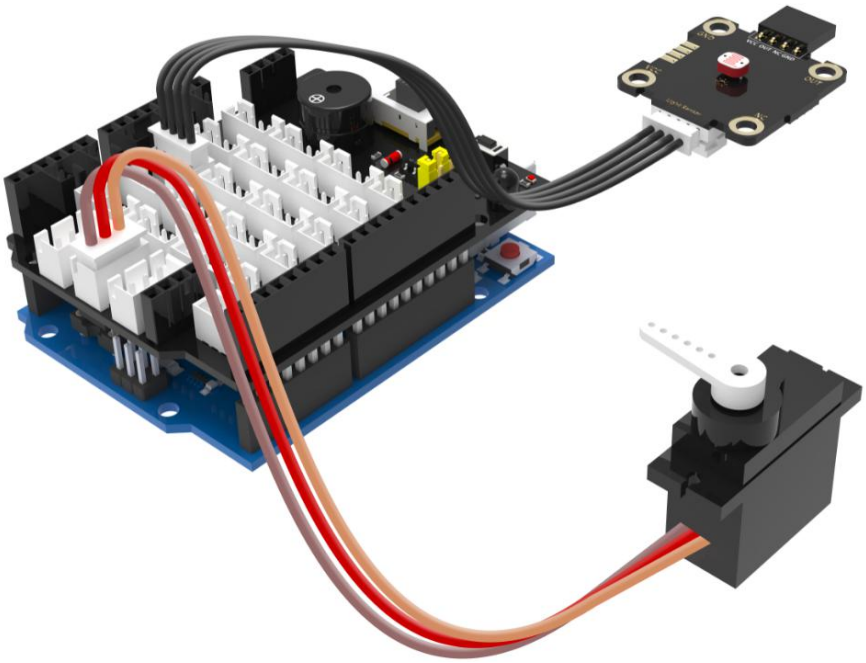
Experimental content: Make a music box. When the box is opened, the buzzer will play music and the servo will rotate. When box is closed, the music stop and servo will stop. When it is opened again, it will continue to rotate from the position where it stop last time.

Experiment preparation: UNO board *1, Plugkit sensor expansion board *1, USB data cable *1, Photosensitive sensor module *1, 9G metal digital servo *1, 4pin cable(PH2.0) *1.

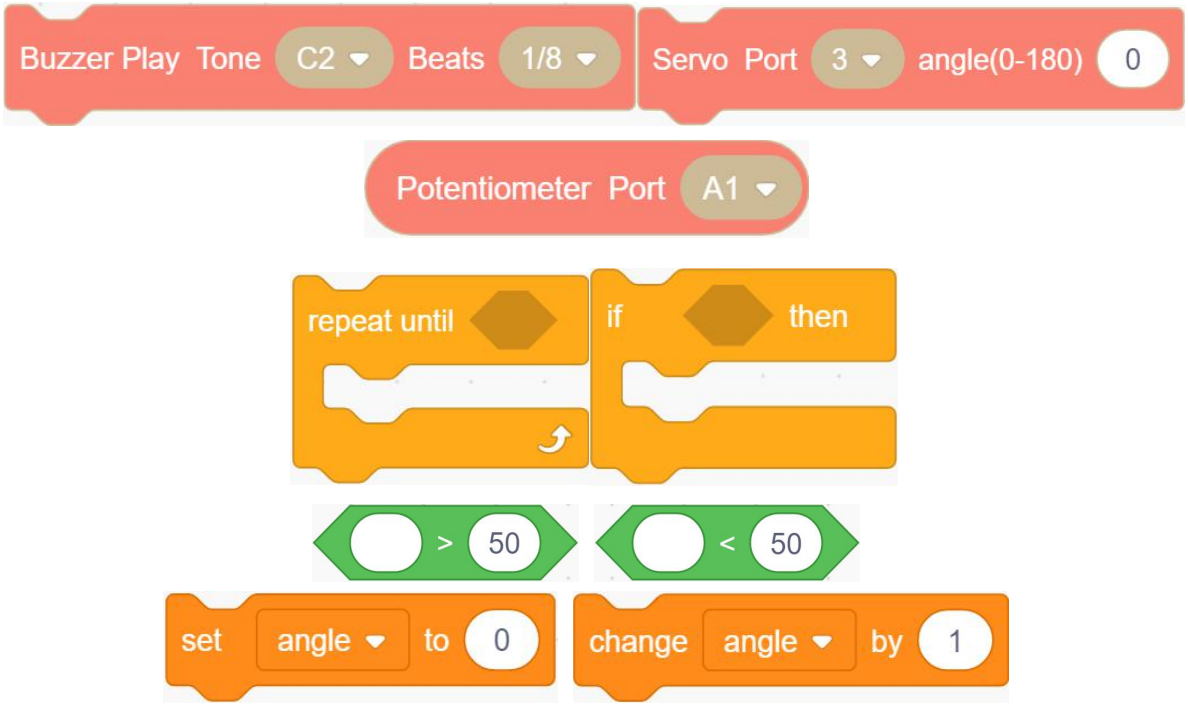
Experimental wiring:



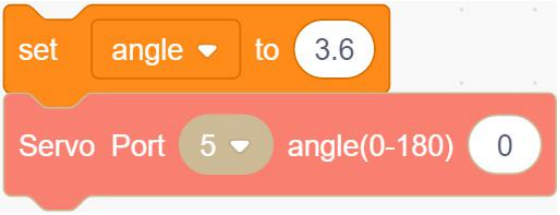
The interface of the servo connected to the sensor expansion board is silk screen (~ 5, 5V, GND).

Experimental steps:

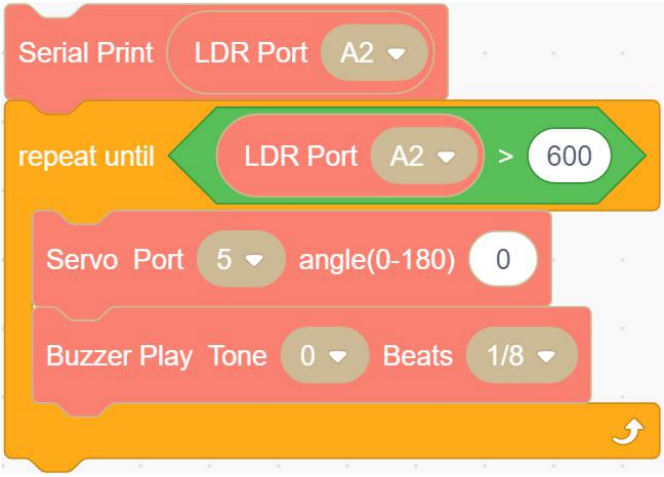
1. Select the following blocks in the [Plugkit], [Control], [Operators], [Variable].



2.The variable "angle" is initialized to 3.6 °, and the initial rotation angle of the servo is 0 °.



3. In the light sensor section, when the value of the photosensitive sensor is greater than 600 (at night), the servo stops rotating and the buzzer stops playing.



4. There are 25 notes in the Happy Birthday song. We need to use 25 buzzer module tone blocks. When play each note, the servo rotates 3.6 °, 3.6 ° * 25 = 90 °, which means play the “happy birthday” song twice, and the servo can rotate 180 ° forward.

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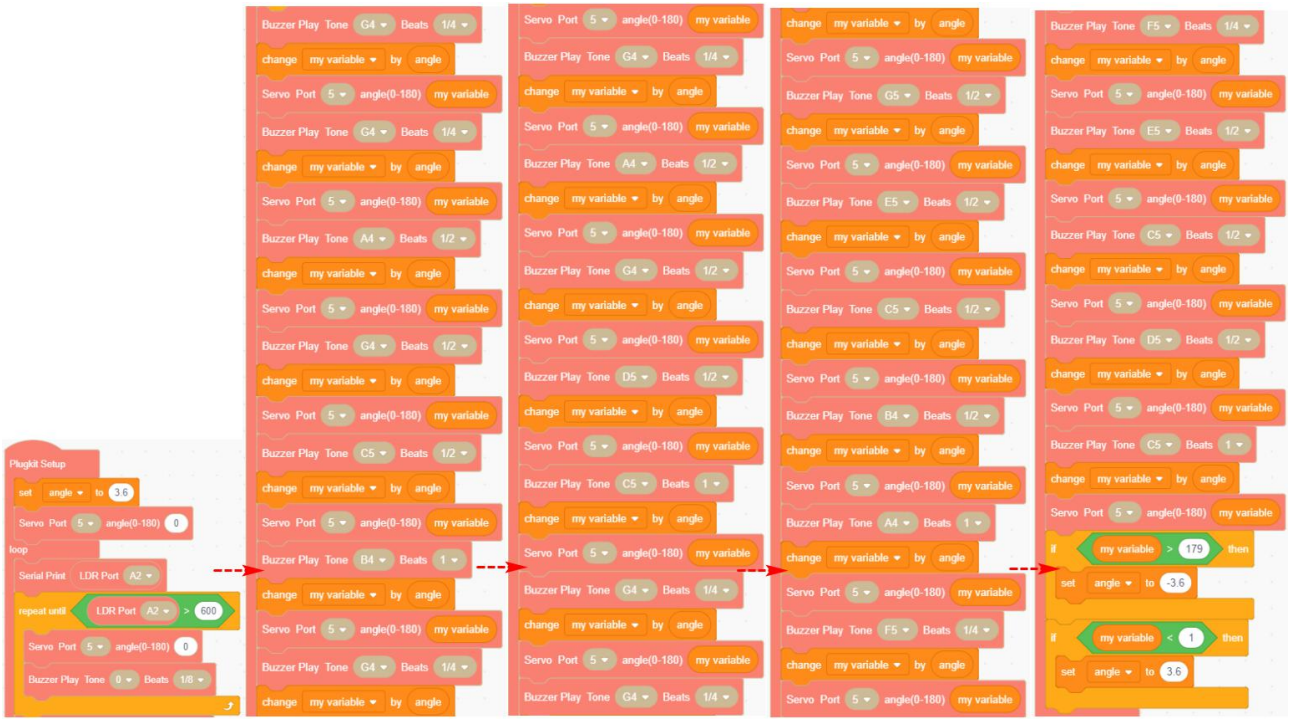
In the blocks, 1234567 represents the pitch of the tone. For example, we can see 3 as the low pitch, 4 as the middle pitch, and 5 as the high pitch. The higher the number, the higher the pitch. CDEFGAB representing the note 1234567. For example: C4 tone is lower than C5 tone is lower than C6.

5.If the rotation angle exceeds 179 °, set the variable angle to -3.6 °. The servo start to reverse.

6.Put Initialize block of step 2 into the setup block, and add the blocks of steps 3, 4, and 5 to the loop. Because the final program is too long, we only provide procedures step-by-step here. Stack blocks together from left to right and put them in the loop. The complete program can refer to the Music box.sb3 file.



7.Compiling and uploading programs.

Experimental phenomena: After uploading the program, the buzzer starts to play music ”Happy birthday” and the servo starts to rotate. When the photosensitive sensor is covered by the hand, it will stop the servo rotation and music. After remove your hand from photosensitive sensor, the servo will continue to rotate from the position where it stopped last time, and the music will continue to play.