

3.6 Mask Testing

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1. Learning Objectives

In this course, we mainly learn how to let the K210 vision module perform mask recognition. When it is recognized that no mask is worn, the buzzer will issue a warning, and the LED dot matrix of the car will display "×",

When the ultrasound detects approaching, the car backs up.

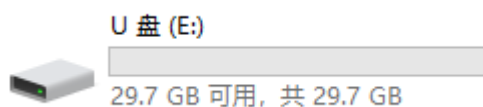
When it is recognized that wearing a mask, the LED dot matrix of the car will display "✓" and make a cheerful sound.

2. preparation before class

1. Take out the TF card from k210 vision module and insert it into the card reader.


















2. Plug the card reader into the computer, and wait for the computer to recognize the USB disk.







3. Then, enter the TF card. You will see following content.

 K210	2023/6/28 9:30
 KPU	2023/3/15 20:05
 main.py	2023/5/29 17:22




- Go to the k210 folder, find the **2.7_3.6_face_mask_detect.py** file from the folder and copy it to the root directory.

 2.1_color_recognition.py	6/7/2023 12:23
 2.2_3.2_find_barcodes.py	6/15/2023 5:40
 2.3_3.3_find_qrcodes.py	6/26/2023 9:16
 2.4_find_apriltags.py	6/2/2023 10:15
 2.5_3.4_object_detect.py	6/26/2023 2:14
 2.6_3.5_self_learning.py	6/28/2023 10:00
 2.7_3.6_face_mask_detect.py	6/28/2023 9:20
 2.8_face_recog.py	6/28/2023 9:21
 2.9_3.8_mnist.py	6/15/2023 4:42
 3.1_color_rgb.py	6/28/2023 4:50
 3.7_face_detect.py	6/15/2023 11:23
 3.9_color_follow_line.py	7/14/2023 5:06
 3.10_follow_apriltag.py	7/13/2023 10:58
 3.11_follow_color.py	7/13/2023 12:11
 3.12_Autopilot.py	7/25/2023 9:29

 K210	8/24/2023
 KPU	8/24/2023
 2.7_3.6_face_mask_detect.py	7/25/2023
 main.py	8/24/2023

- Delete the original **main.py** file.

Then, re-name the **2.7_3.6_face_mask_detect.py** file as the **main.py** file.

 K210	8/24/2023 3:30
 KPU	8/24/2023 3:30
 2.7_3.6_face_mask_detect.py	7/25/2023 9:20

- After re-name, pull out the card reader, remove the TF card and insert it back into the k210 vision module.

3. Programming Methods

Online programming: first copy this URL <https://makecode.microbit>. and enter the online programming interface.

Click Extension, copy the package URL: <https://github.com/YahboomTechnology/K210-Module.git> to the input field, click Confirm to add package,

Click Extension again, copy the package URL: <https://github.com/YahboomTechnology/Tiny-bitLib> to the input field, click Confirm to add the package.

Finally you can use the K210 Vision Module package and Tinybit's building blocks.

4. Blocks

The image displays a block-based programming interface, likely for a micro:bit. On the left is a block palette with categories: Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, k210_models, Tinybit, Neopixel, and Extensions. The 'Basic' category is selected. On the right is the workspace containing a sequence of blocks: 'show number' with a value of 0, 'show leds' (a 5x5 grid), 'show icon' with a grid icon, 'show string' with the text 'Hello!', 'clear screen', and a 'forever' loop block.

Block Palette (Left):

- Basic
- Input
- Music
- Led
- Radio
- Loops
- Logic
- Variables
- Math
- k210_models
- Tinybit
- Neopixel
- Extensions
- Advanced
- Functions
- Arrays

Workspace (Right):

- show number 0
- show leds
- show icon (grid icon)
- show string "Hello!"
- clear screen
- forever

The image shows a block palette on the left and a workspace on the right. The palette has categories: Basic (grid icon), Input (circle with dot), Music (headphones), Led (candle), Radio (signal bars), Loops (refresh), Logic (if/else), Variables (list), Math (calculator), k210_models (puzzle), Tinybit (car), Neopixel (dots), and Extensions (+). Below these are Advanced (caret up), Functions (f(x)), and Arrays (list with numbers). The workspace contains a sequence of blue blocks: 'show icon' with a grid icon, 'show string' with 'Hello!', 'clear screen', a 'forever' loop containing a 'pause (ms)' block with '100', and 'show arrow' with 'North'. A pink box highlights the 'on start' block in the workspace.

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

k210_models

Tinybit

Neopixel

Extensions

Advanced

Functions

Arrays

show icon

show string "Hello!"

clear screen

forever

on start

pause (ms) 100

show arrow North

The image shows a block palette on the left and a workspace on the right. The palette has categories: Music (headphones), Led (candle), Radio (signal bars), Loops (refresh), Logic (if/else), Variables (list), Math (calculator), and k210_models (puzzle). The workspace contains a 'play melody' block with a musical note icon and '120 (bpm)', a 'Tone' section with a 'play tone' block (Middle C, 1 beat, until done) and a 'ring tone (Hz)' block (Middle C). A pink box highlights the 'play tone' and 'ring tone' blocks in the workspace.

Music

Led

Radio

Loops

Logic

Variables

Math

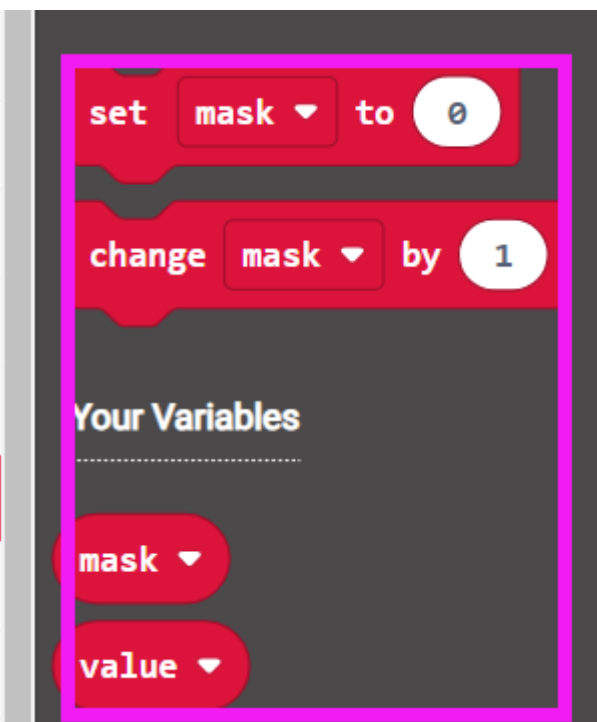
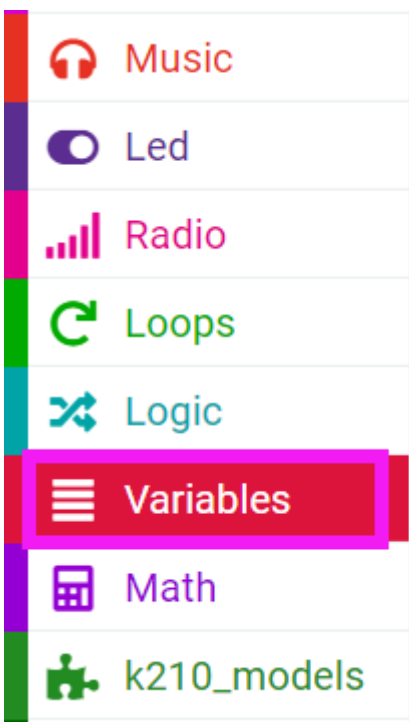
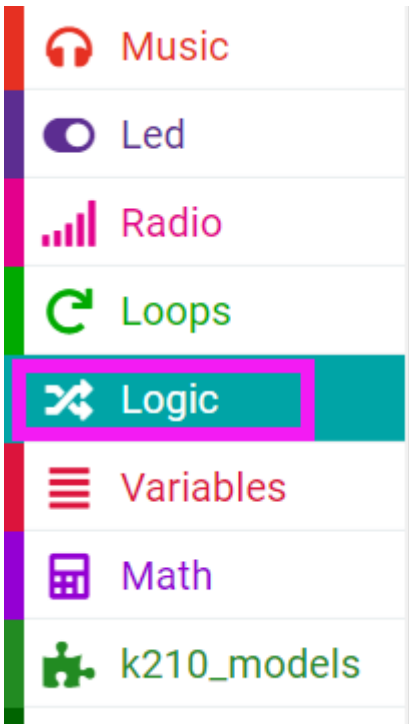
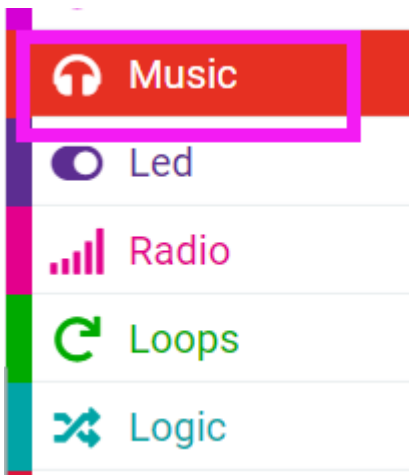
k210_models

play melody at tempo 120 (bpm)

Tone

play tone Middle C for 1 beat until done

ring tone (Hz) Middle C



Search...



Basic



Input



Music



Led



Radio



Loops



Logic



Variables



Math



k210_models



Tinybit



Neopixel



Extensions



Advanced



Functions



Arrays

face_mask Scan return

Apriltag Scan return

get right motor

get left motor

analysis speed

Color scan return

QRcode scan return

Barcode scan return

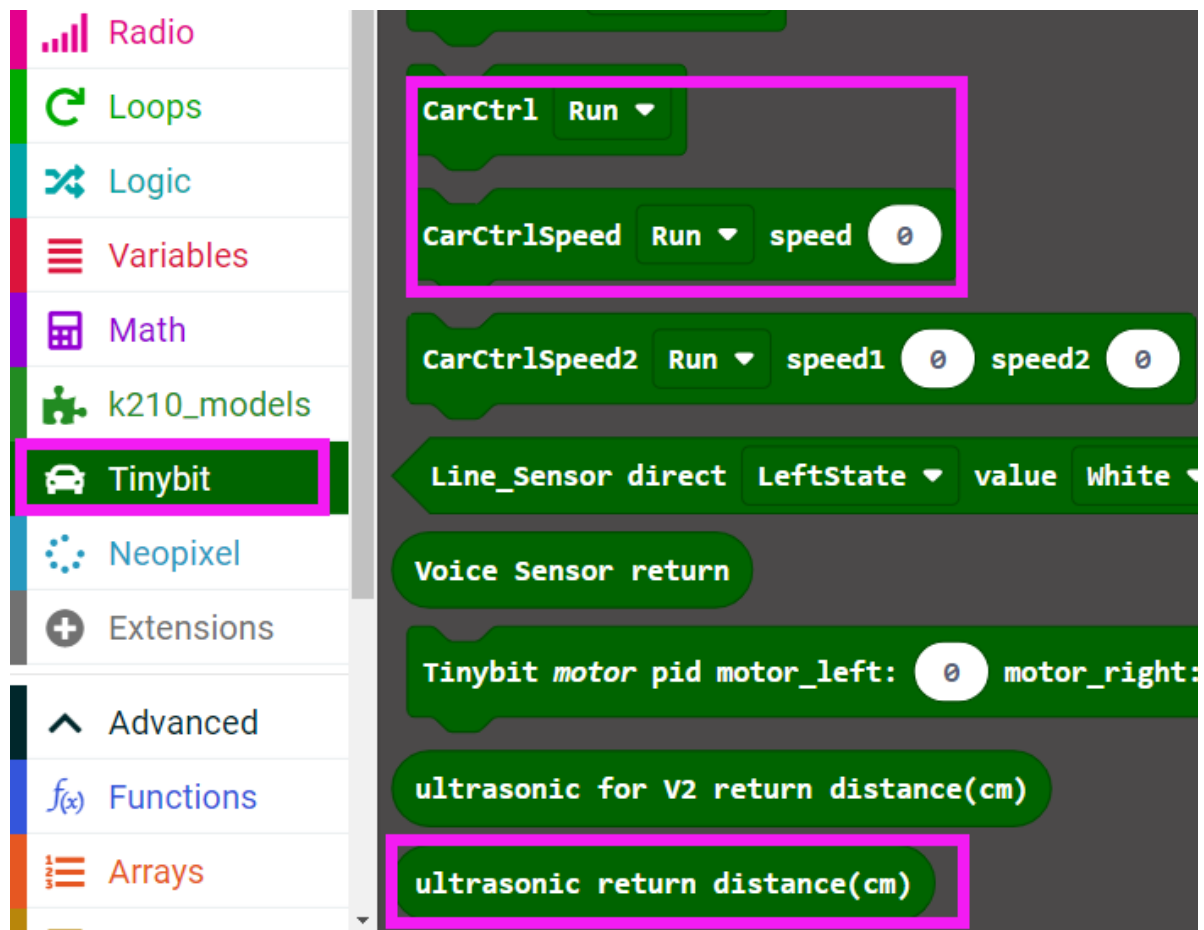
reg_H return

reg_W return

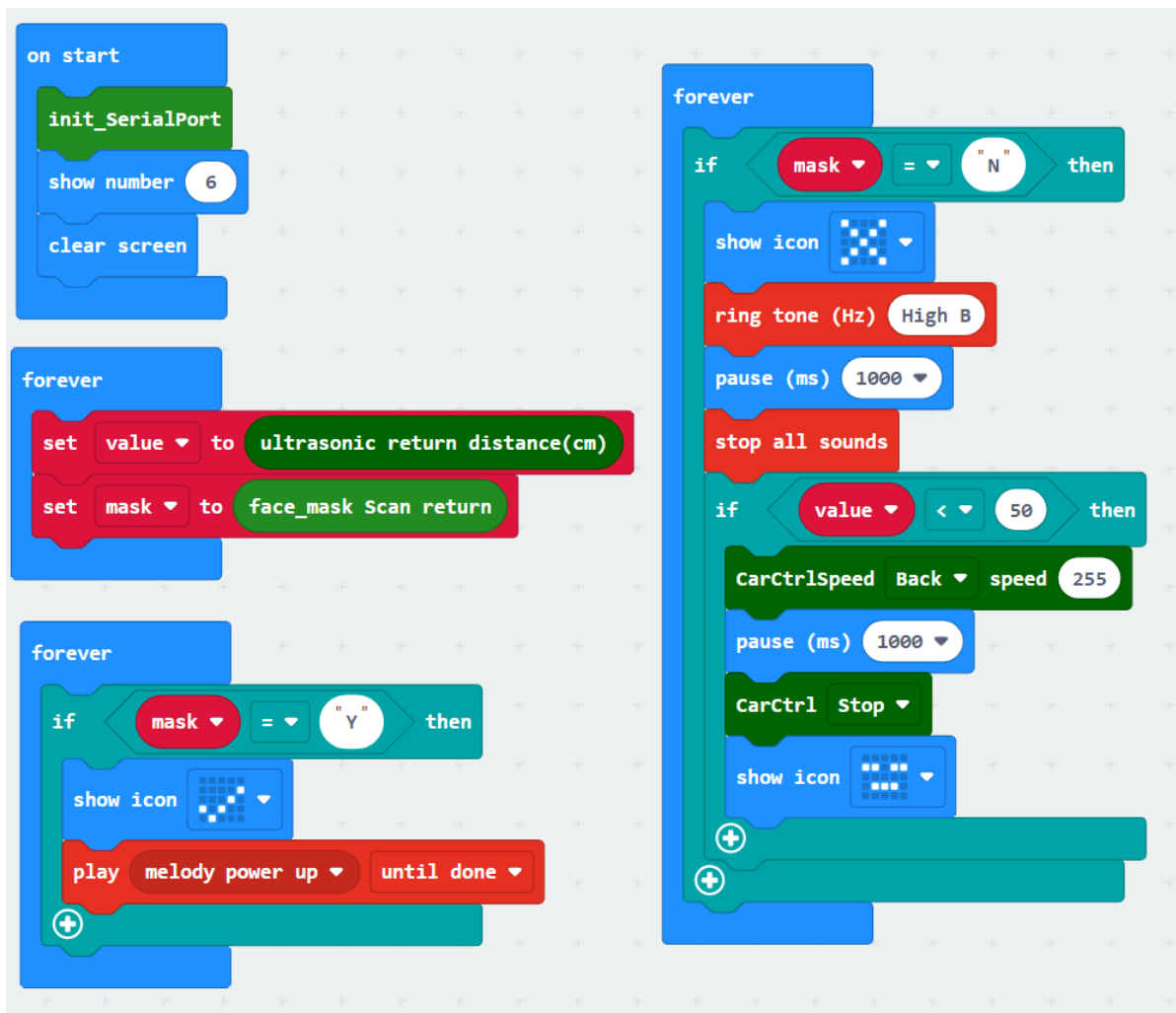
reg_Y return

reg_X return

init_SerialPort



5. Code



6. Download code

Connect the Micro:bit board to the computer via microusb cable, the computer will pop up a USB disk.

Then, select the **k210_Mask_detection.hex** file and right click to send it to the Micro:bit U disk.

Wait until sending is complete and unplug the Micro:bit usb cable. Plug the Micro:bit board into the car.

7. Experimental Phenomena

After starting the car, we can see the number 6 displayed on the dot matrix of the microbit.

Wait for the screen to display the camera image, and then use the camera to capture the face.

When wearing a mask, a green box and "with mask" will be displayed, the LED dot matrix of the microbit will display "√", and the car will play cheerful music;

When not wearing a mask, the red frame and "without mask" will be displayed, the LED dot matrix of the microbit will display "×", the buzzer of the car will alarm, when the alarm is reached, the car will back up, and "--__" will be displayed .

