2.5 Object recognition

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1. Learning objectives

In this course. We will realize that k210 vision module performs recognition of specific objects (20 types in total, namely: 'airplane', 'bicycle', 'bird', 'boat', 'bottle', 'bus', 'car', 'cat', 'chair', 'cow', 'dining table', 'dog', 'horse', 'motorbike', 'person', 'potted plant', 'sheep', 'couch', 'train', and 'TV screen'). . When the corresponding object is recognized, the id of the object is displayed on the Micro:bit board.

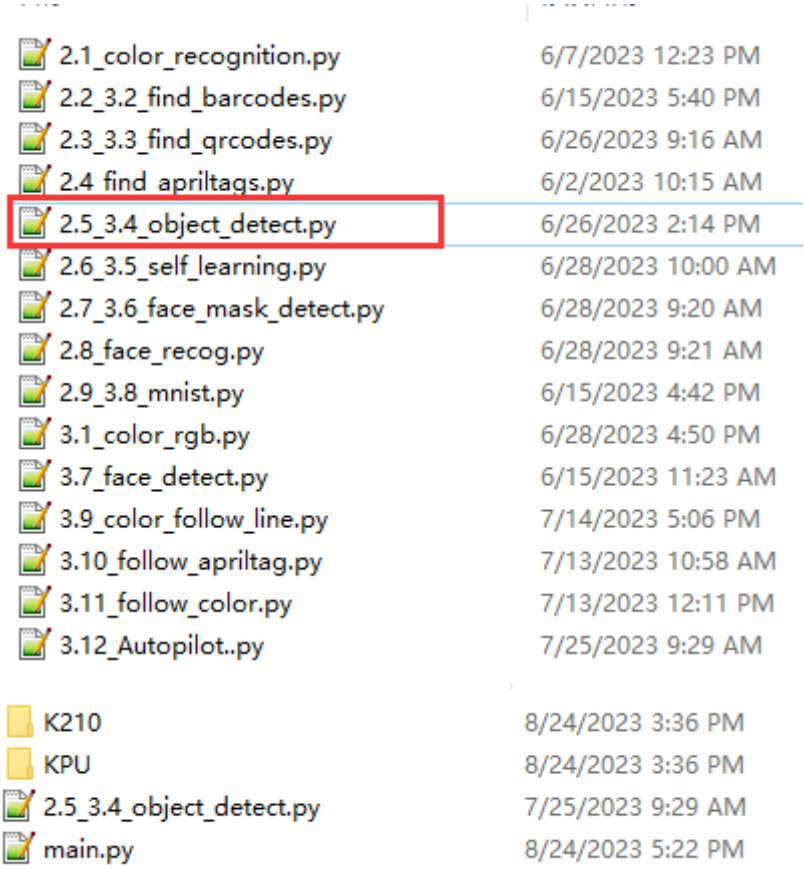
2. Preparation for the class

1. Remove the TF card from the 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.

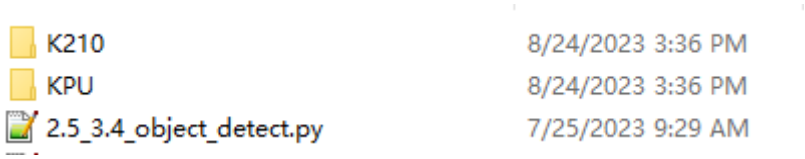
3. Then, enter the TF card. You will see following content.

4. Go to the k210 folder, find the **2.5_3.4_object_detect.py** file from the folder and copy it to the root directory.



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

   Then, re-name the **2.5_3.4_object_detect.py** file as the **main.py** file.

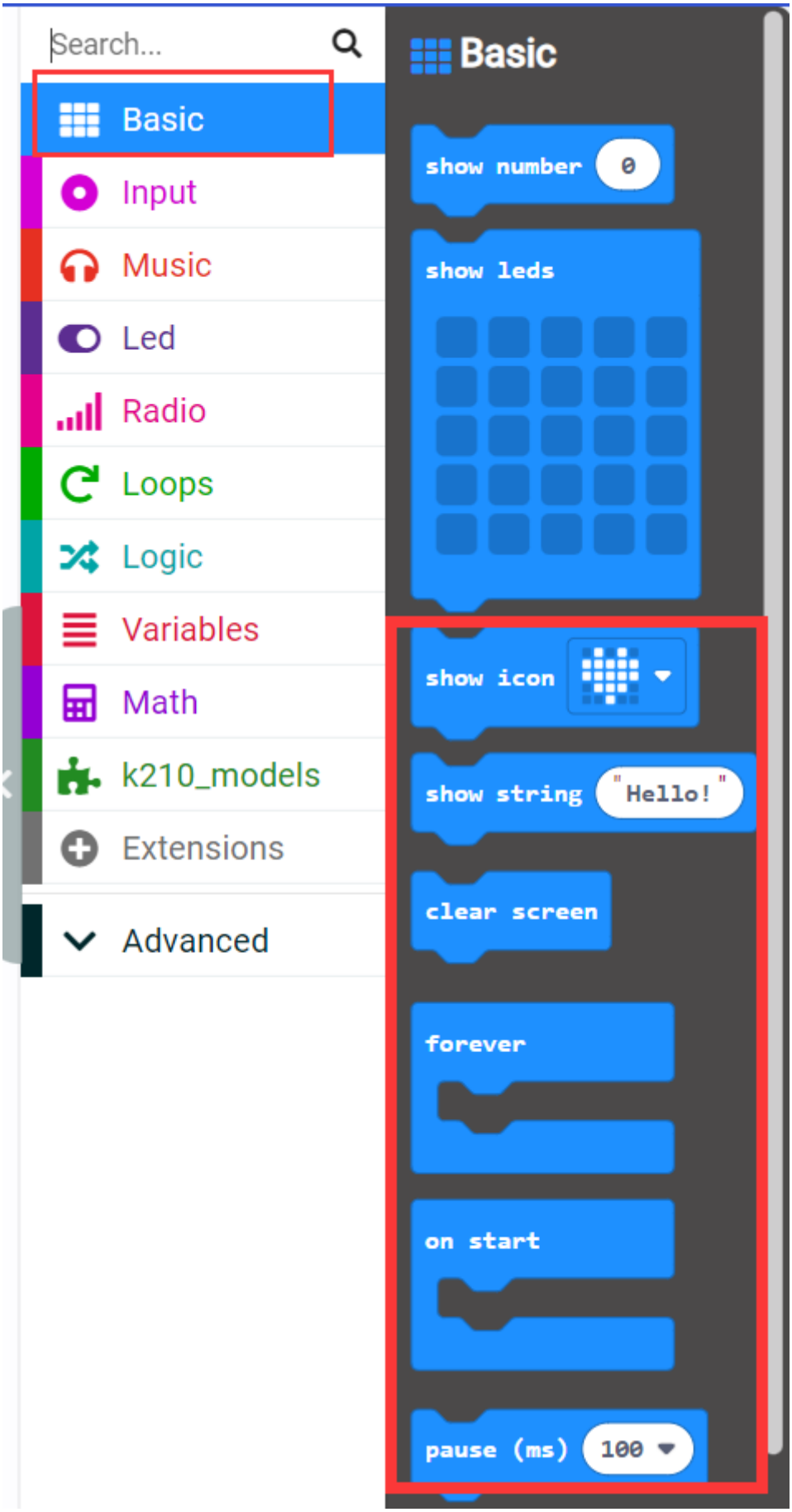


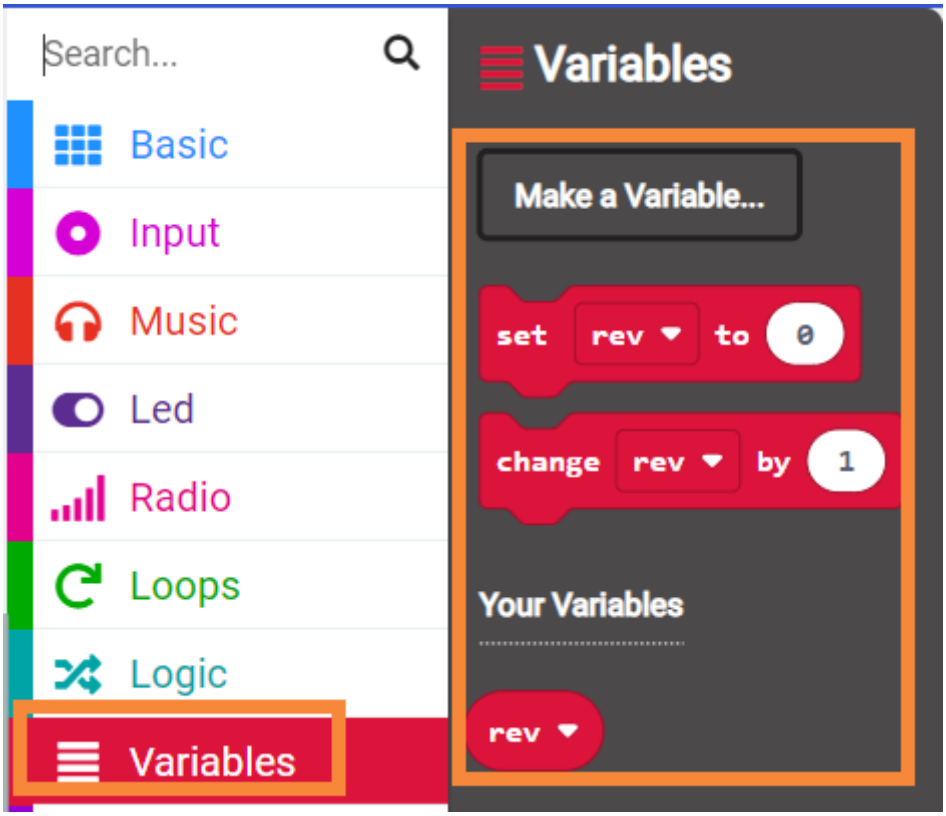
6. After re-name, pull out the card reader, remove the TF card and insert it back into the k210 vision module.

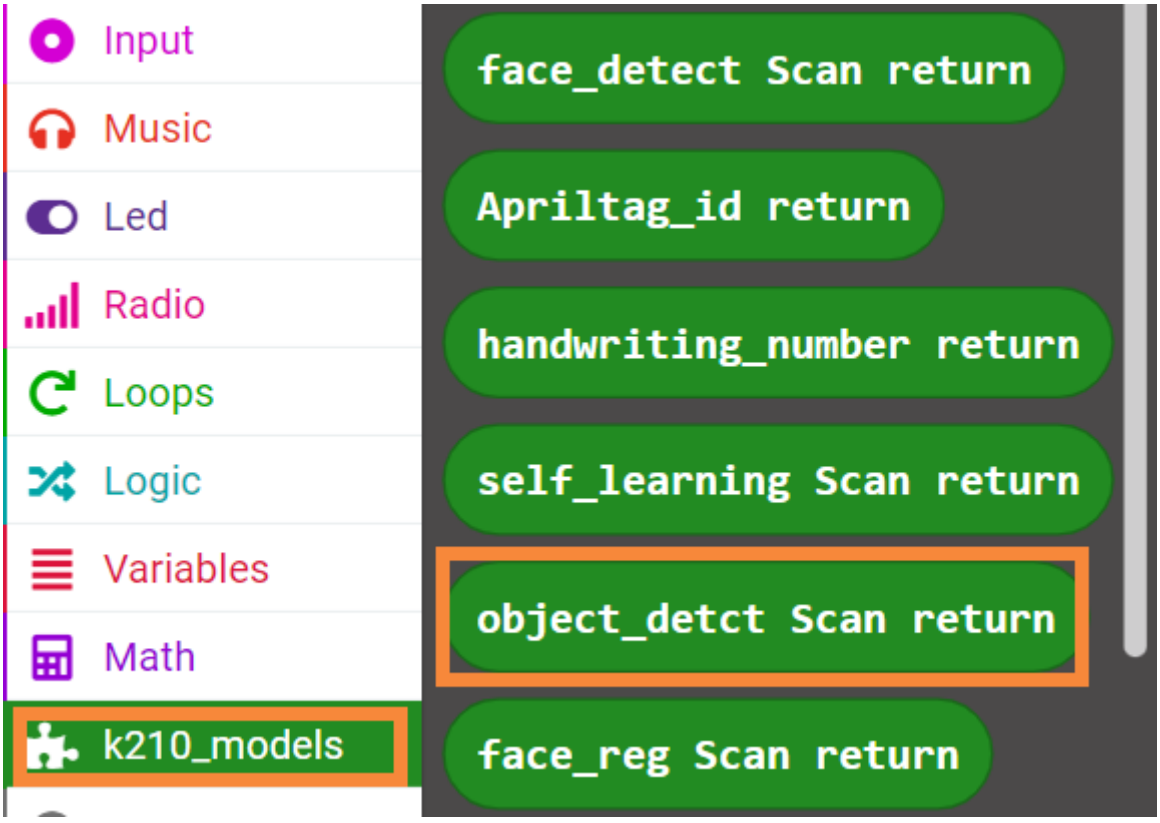
3. Programming Methods

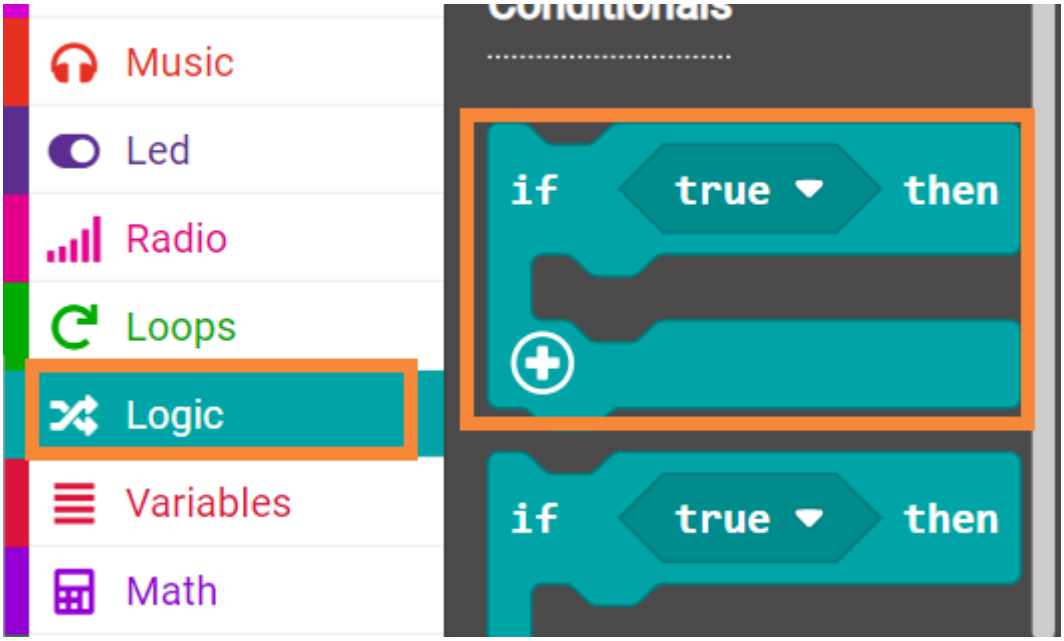
Online programming: first copy this URL https://makecode.microbit. to enter the online programming interface. Copy the package URL: https://github.com/YahboomTechnology/K210-Module.git to the input field, click confirm to add the package, after that you can use the blocks of K210 vision module package.

4. Blocks

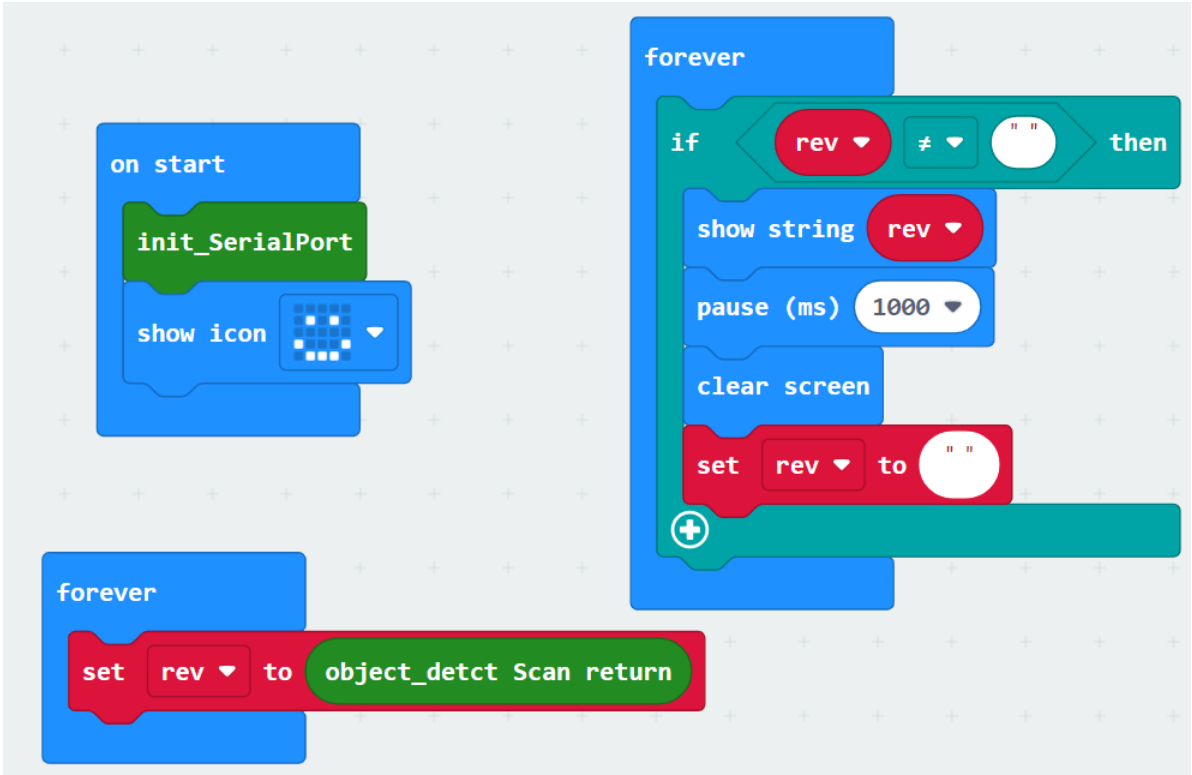

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
k210_models
Extensions
Advanced
Basic
show number 0
show leds
show icon
show string "Hello!"
clear screen
forever
on start
pause (ms) 100


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Variables
Make a Variable...
set rev to 0
change rev by 1
Your Variables
rev


Input
Music
Led
Radio
Loops
Logic
Variables
Math
k210_models
face_detect Scan return
Apriltag_id return
handwriting_number return
self_learning Scan return
object_detct Scan return
face_reg Scan return



5. Code



6. Download code

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

Then, select the **microbit_object_detect.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, wait for the screen to display the camera image.

After displaying the screen, point the camera at the object to be recognized (A total of 20 objects can be recognized, namely: "Aircraft", "Bicycle", "Bird", "Boat", "Bottle", "Bus", "Car", "Cat", "Chair", "Cow", "Dining table", "Dog", "Horse", "Motorbike", "Person", "Potted plant", "Sheep", "Sofa", "Train", " TV screen"). , after recognition, the id of the object is displayed on the Micro:bit board.

The id of the cat in the picture below is 07.