

## 3.3 QR code recognition

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## 1. Learning Objective

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In this course, we will learn how to realize the QR code to control the movement of the car.

The K210 vision module recognizes QR codes with a total of four commands: ***go forward***, ***go back***, ***turn left***, and ***turn right***.

When the forward command is recognized, a forward arrow will be displayed on the microbit board, and the car will move forward for one second;

When the backward command is recognized, a backward arrow will be displayed on the microbit board, and the car will move backward for one second

When the left command is recognized, a left arrow will be displayed on the microbit board, and the car will turn left for one second;

When the right command is recognized, a right arrow will be displayed on the microbit board, and the car will turn right for one second.

## 2. Preparation for the class

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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.

K210	2023/6/28/周三 9:36
KPU	2023/4/13/周四 16:30
main.py	2060/1/1/周四 0:00

4. Go to the k210 folder, find the **2.3\_3.3\_find\_qrcodes.py** file from the folder and copy it to the root directory.

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

K210	8/24/2023 3:36 PM	3
KPU	8/24/2023 3:36 PM	3
2.3_3.3_find_qrcodes.py	7/25/2023 9:29 AM	P
main.py	8/24/2023 5:22 PM	P

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

Then, re-name the **2.3\_3.3\_find\_qrcodes.py** file as the **main.py** file.

K210	8/24/2023 3:36 PM
KPU	8/24/2023 3:36 PM
2.3_3.3_find_qrcodes.py	7/25/2023 9:29 AM

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

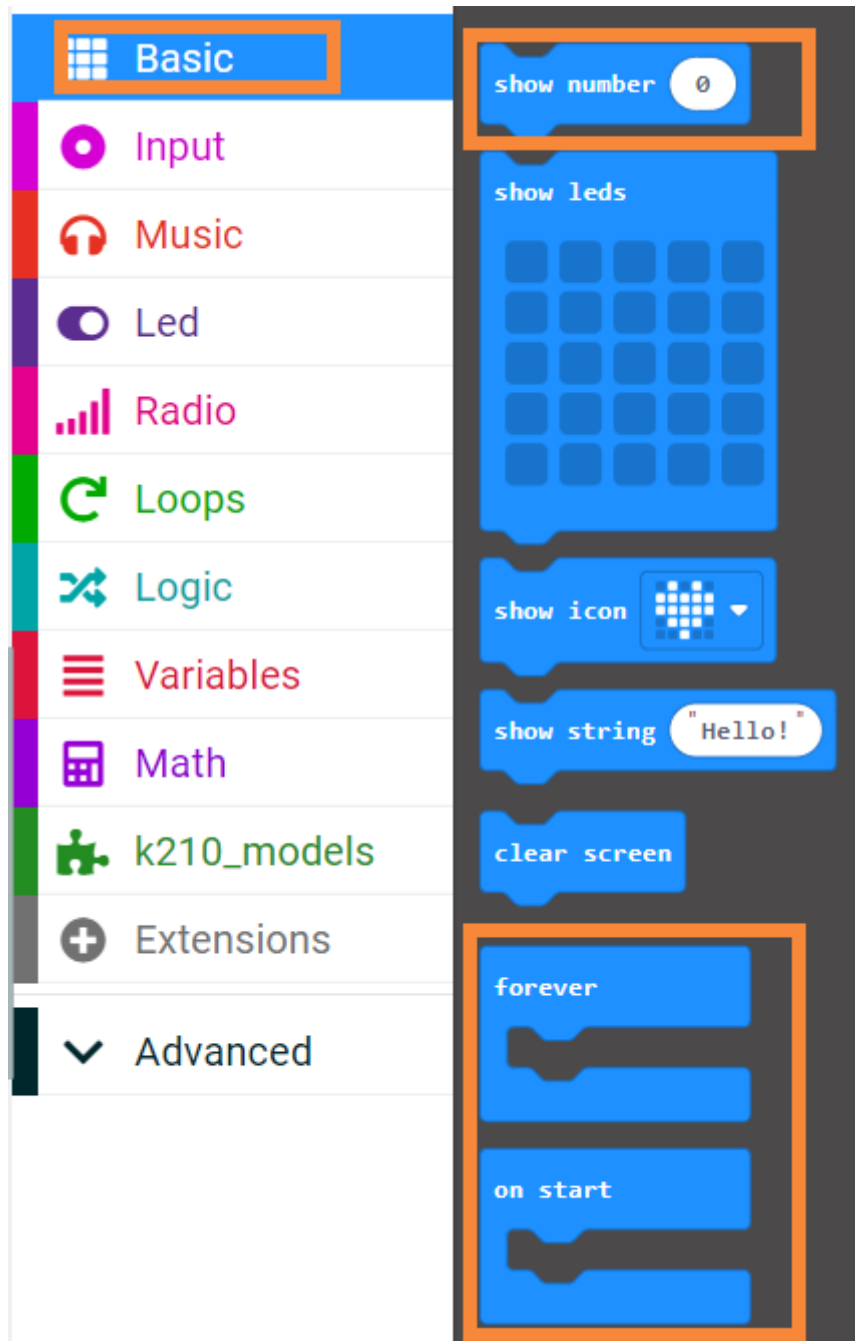
Online programming: first copy this URL <https://makecode.microbit>. and enter the online programming interface.

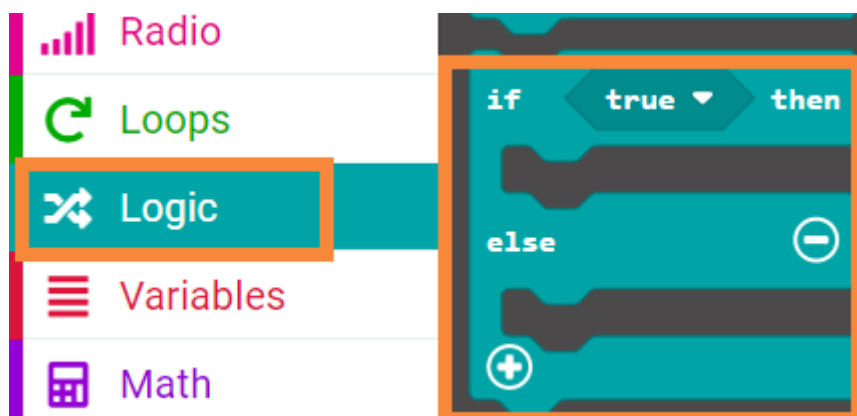
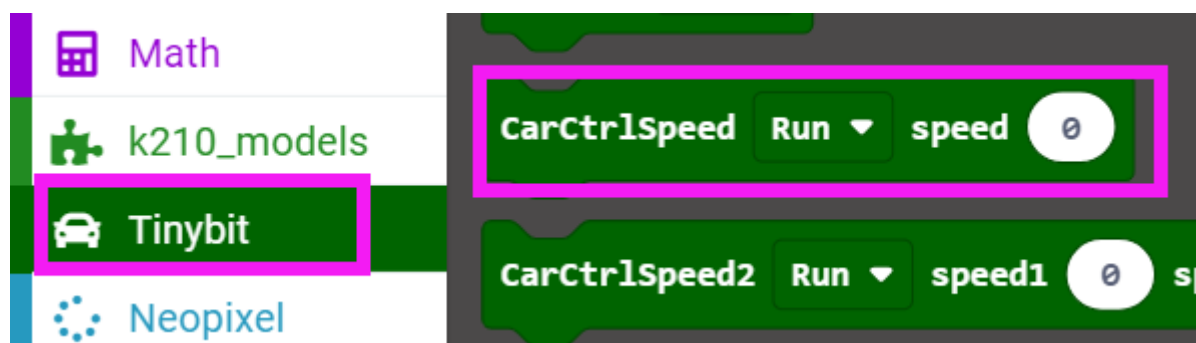
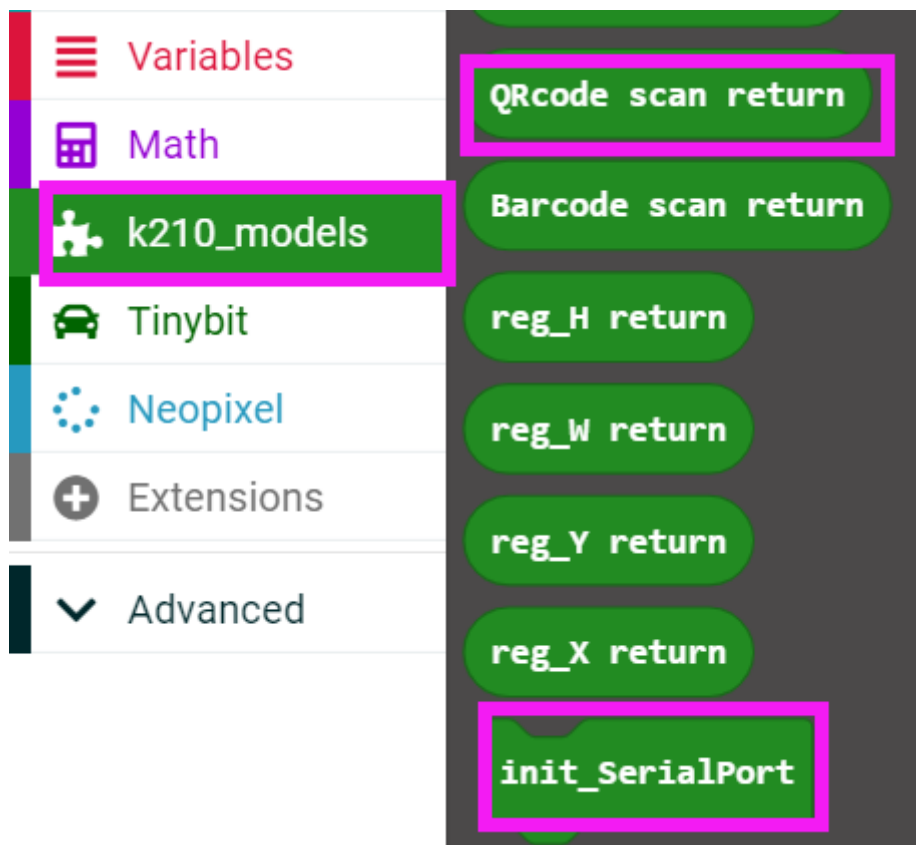
Click Extension, copy the package URL: <https://github.com/YahboomTechnology/K210-Module.git> to the input field, click Confirm to add package,

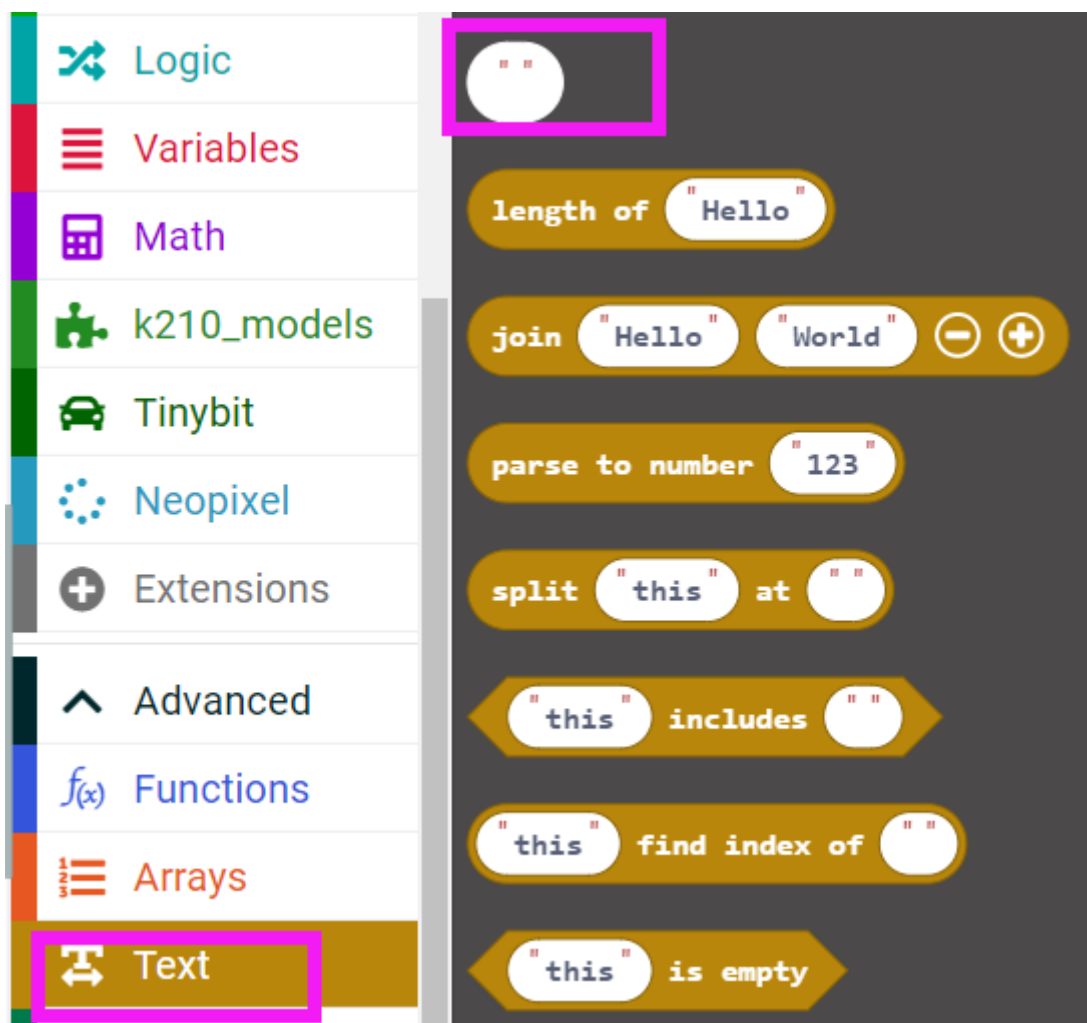
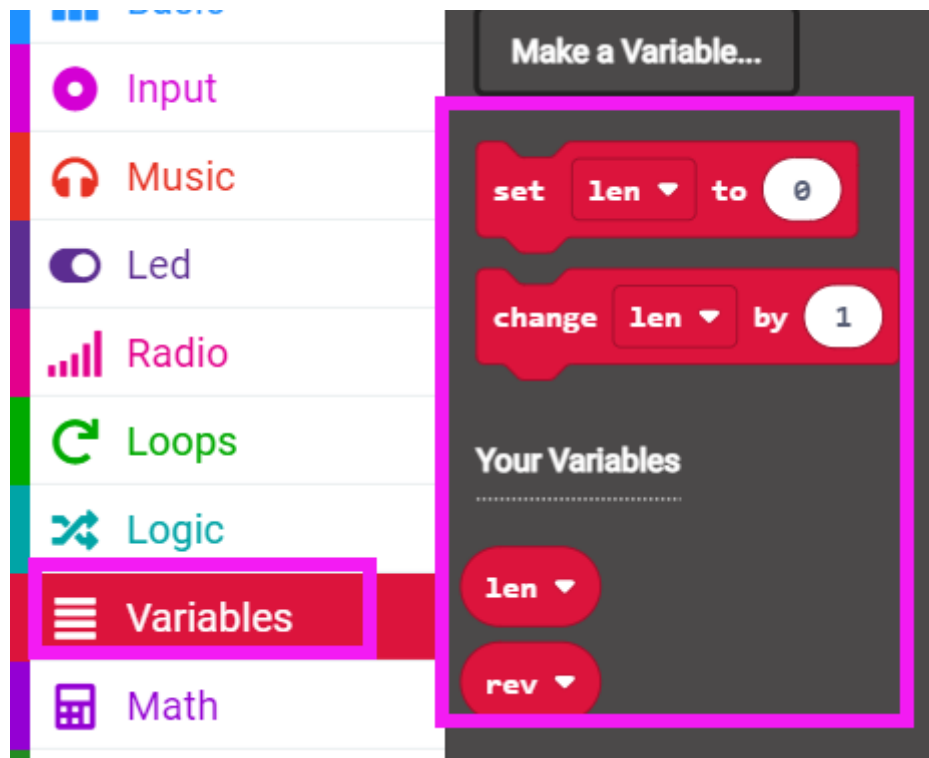
Click Extension again, copy the package URL: <https://github.com/YahboomTechnology/Tiny-bitLib> to the input field, click Confirm to add the package.

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

## 4. Blocks

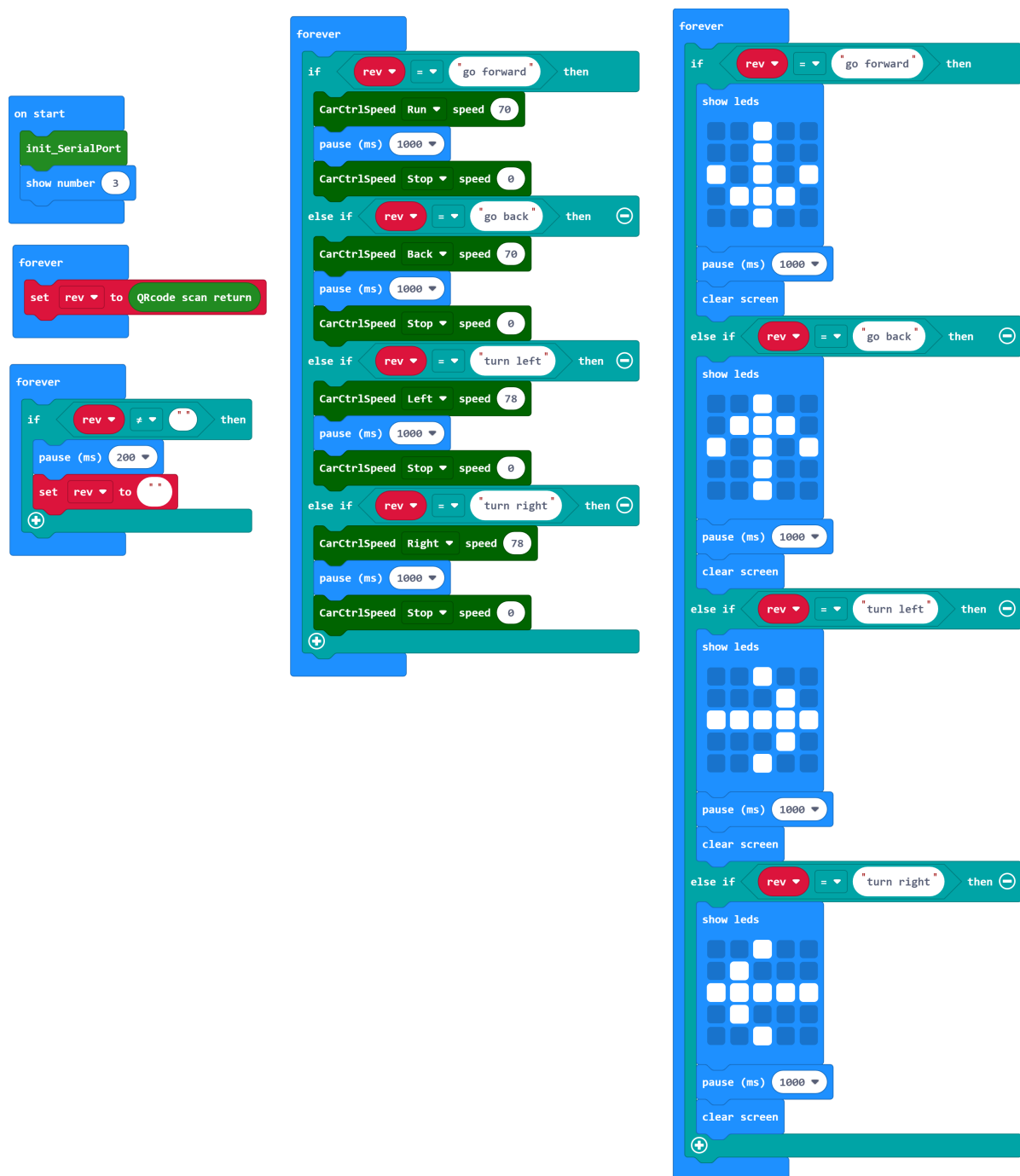






## 5. Code

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## 6. Download code

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

Then, select the **k210\_qrcode\_oder.hex** code 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 QR code to be recognized. After recognition, the cart will perform the corresponding action according to the instruction, and at the same time the instruction icon will be displayed on the microbit board at the same time.

When the forward command is recognized, a forward arrow will be displayed on the microbit board, and the car will move forward for one second;

When the backward command is recognized, a backward arrow will be displayed on the microbit board, and the car will move backward for one second

When the left command is recognized, a left arrow will be displayed on the microbit board, and the car will turn left for one second;

When the right command is recognized, a right arrow will be displayed on the microbit board, and the car will turn right for one second.



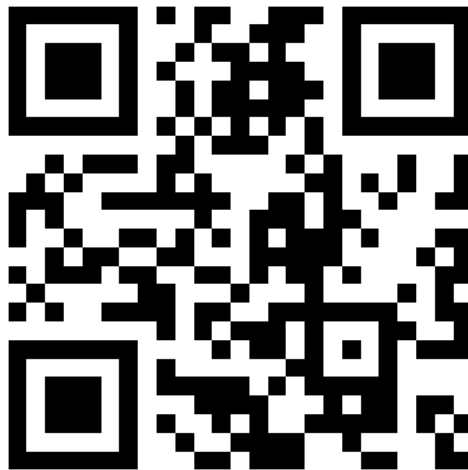
QR code image:



**go forward**



go back



turn left



turn right



