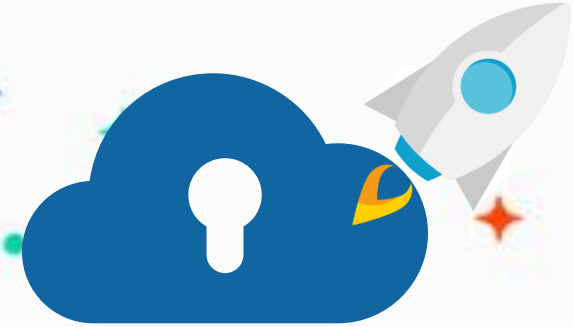

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Lesson 8. Magnetic Anti-theft Cabinet

LECTURER:

Lesson Objective

Learning Objectives

1. Learn about the types and development history of anti-theft cabinets.

2. Have an in-depth understanding of magnetic sensors, and make anti-theft cabinets based on magnetic sensors.

Possible Difficulties

1. The magnetic sensor is susceptible to false triggering due to the influence of the environment and shaking.

2. The magnetic strength will change according to the position.



Background Information

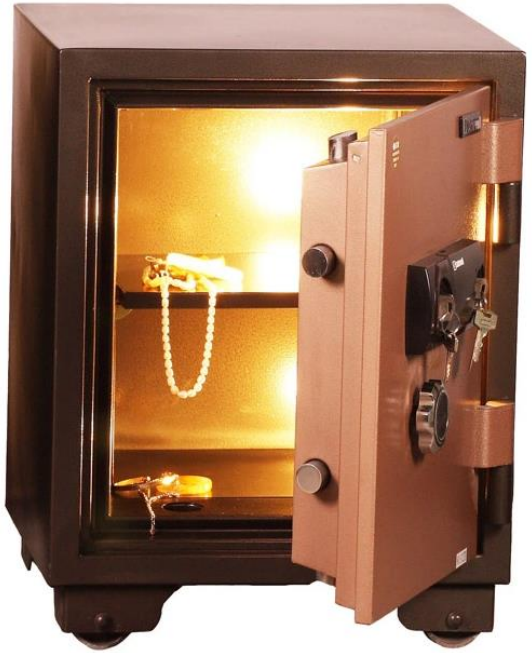


Context Import



The anti-theft safe is a special container. According to different working principles, anti-theft safes can be divided into two types: mechanical safes and electronic safes. Mechanical safes are usually opened with physical keys, while electronic safes use electronic keys as the basis for unlocking.

Context Import



With the development of society, safes are mainly divided into fire safes and theftproof safes, antimagnetic safes, fire antimagnetic safes and fire theftproof safes and the fire theftproof safes and so on according to their functions. Each has its corresponding production standard. Today we will use a magnetic sensor to make a special magnetic anti-theft cabinet.



Knowledge Introduction

New Knowledge



The history of safes can be traced back to the Middle Ages. In the paintings of the Middle Ages, you can occasionally see a wooden cabinet containing gold, silver and jewelry, which is the prototype of a modern safe. The safe at this time was not sophisticated and had no reliable locks.

New Knowledge



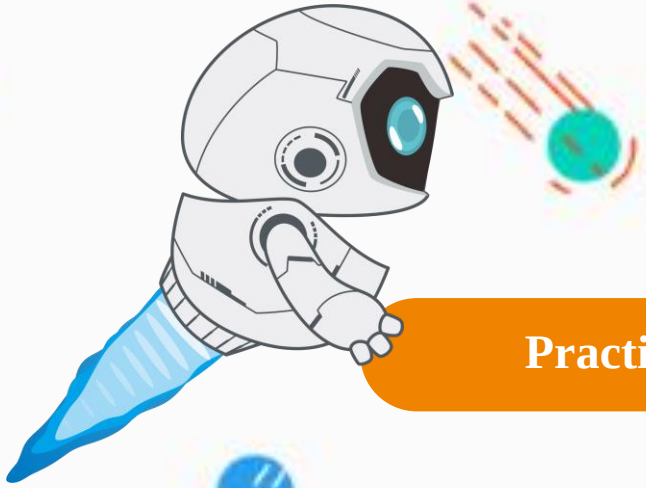
Until the late 1860s, the invention of the locking mechanism and multi-lock bolt technology for safes, the security performance of the safe has been greatly improved.

New Knowledge



In the 1960s and 1970s, due to the rapid development of semiconductor technology, the industry developed electronic combination locks, which are also widely used in various types of safe products.

Up to now, face recognition, automatic photo taking when opening the cabinet, networked alarm safes and other anti-theft cabinets with higher security have appeared.

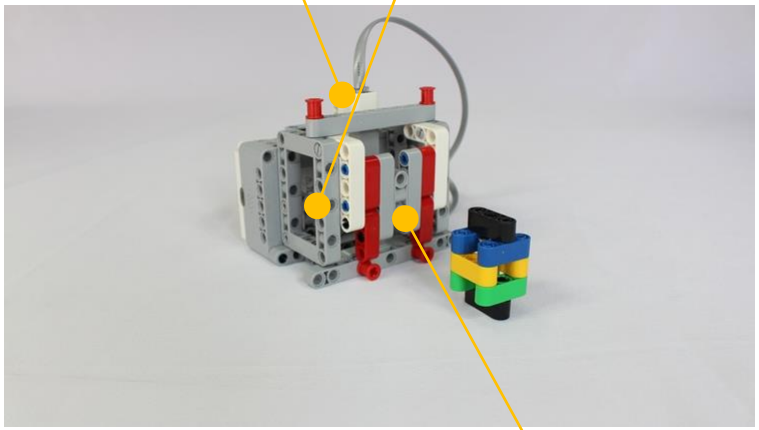


Practice



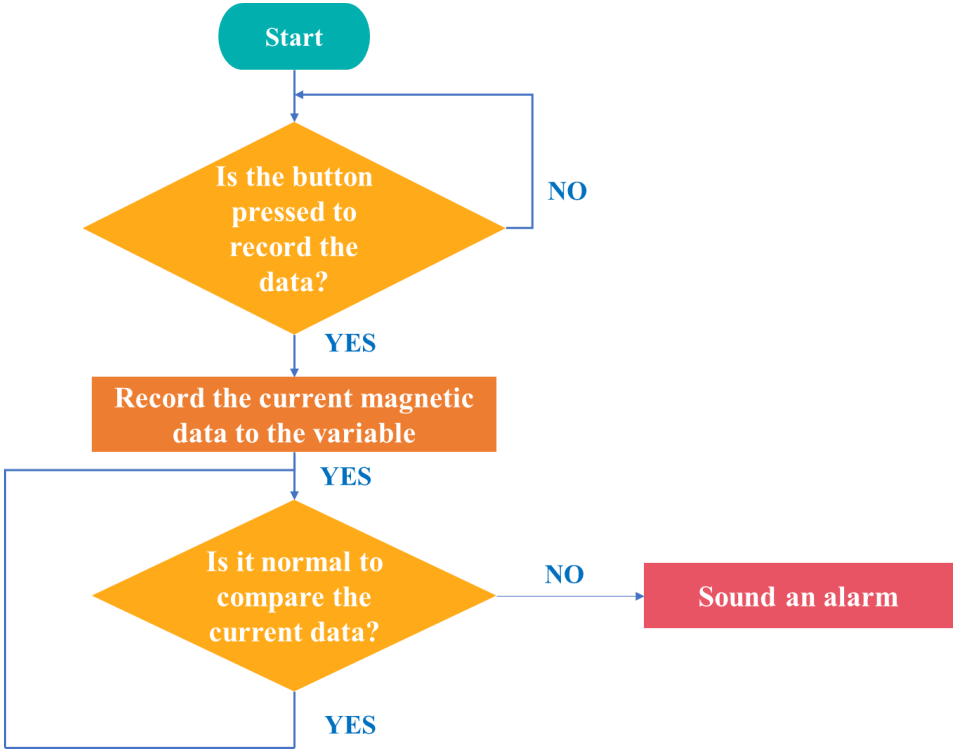


New Knowledge



Build a magnetic anti-theft cabinet according to the construction manual, and the alarm will sound when the magnetic object is taken away.

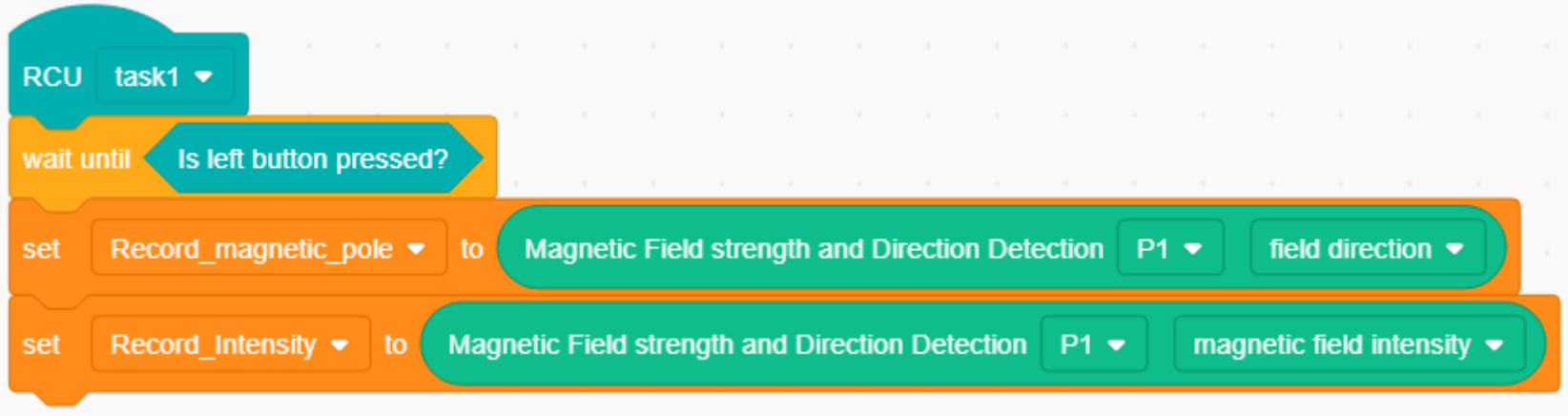
Practice | Programming



Detect whether there is a magnetic object in the cabinet, record its magnetic strength, and when the magnetic strength changes, an alarm will sound.

After starting the program, put in a magnetic object and record the current magnetic intensity value, and constantly monitor whether the data changes, and when the change is large, an alarm will be issued.

Practice | Programming



Record the data

Put in the magnetic object and press the left button to record the current magnetic field direction and magnetic field intensity into the corresponding variables.

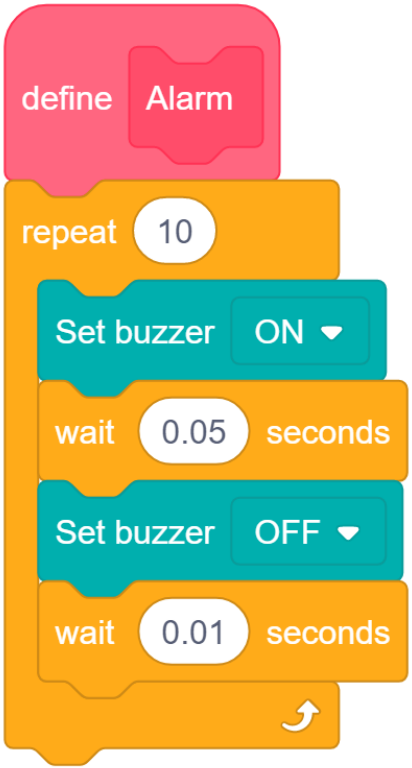
Practice | Programming



Monitor the data

The data of the magnetic sensor is cyclically read for comparison with the previously recorded data.

Practice | Programming

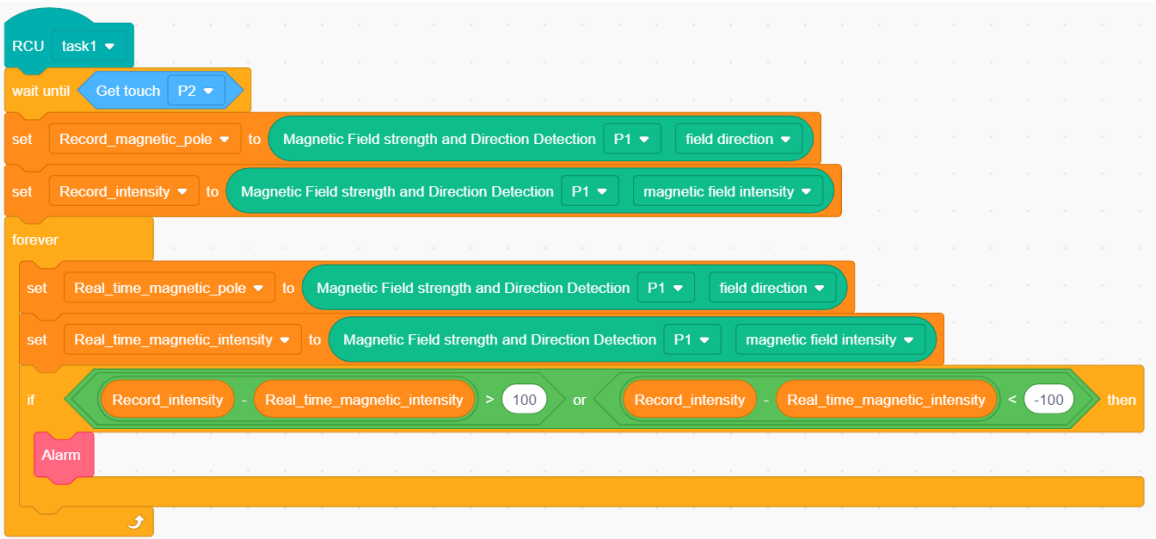


Alarm subroutine - self-made blocks

Switch on and off the buzzer several times in a short period of time to achieve the effect of an alarm.

The waiting time can be adjusted by yourself.

Practice | Programming

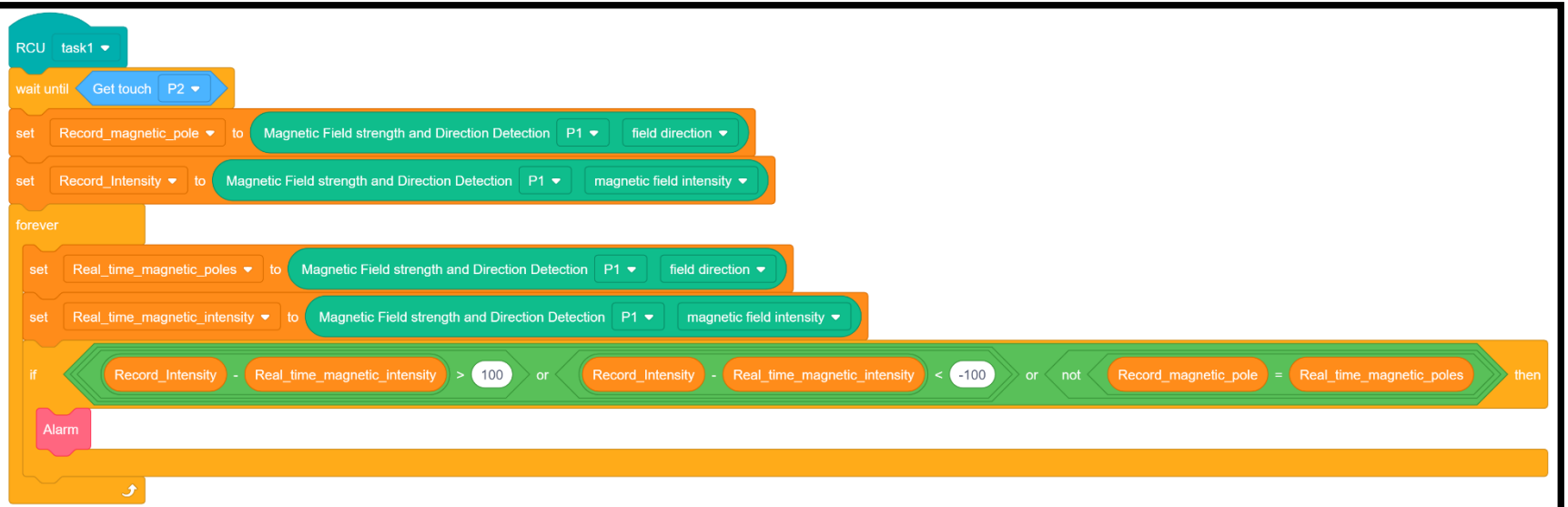


Judgment of movement

When the difference value of magnetic intensity is greater than 100, the object inside the cabinet is considered to be stolen and an alarm is sounded.

Since the fluctuation of the difference value will be larger the farther away from the magnetic sensor, it can be fine-tuned according to the actual placement.

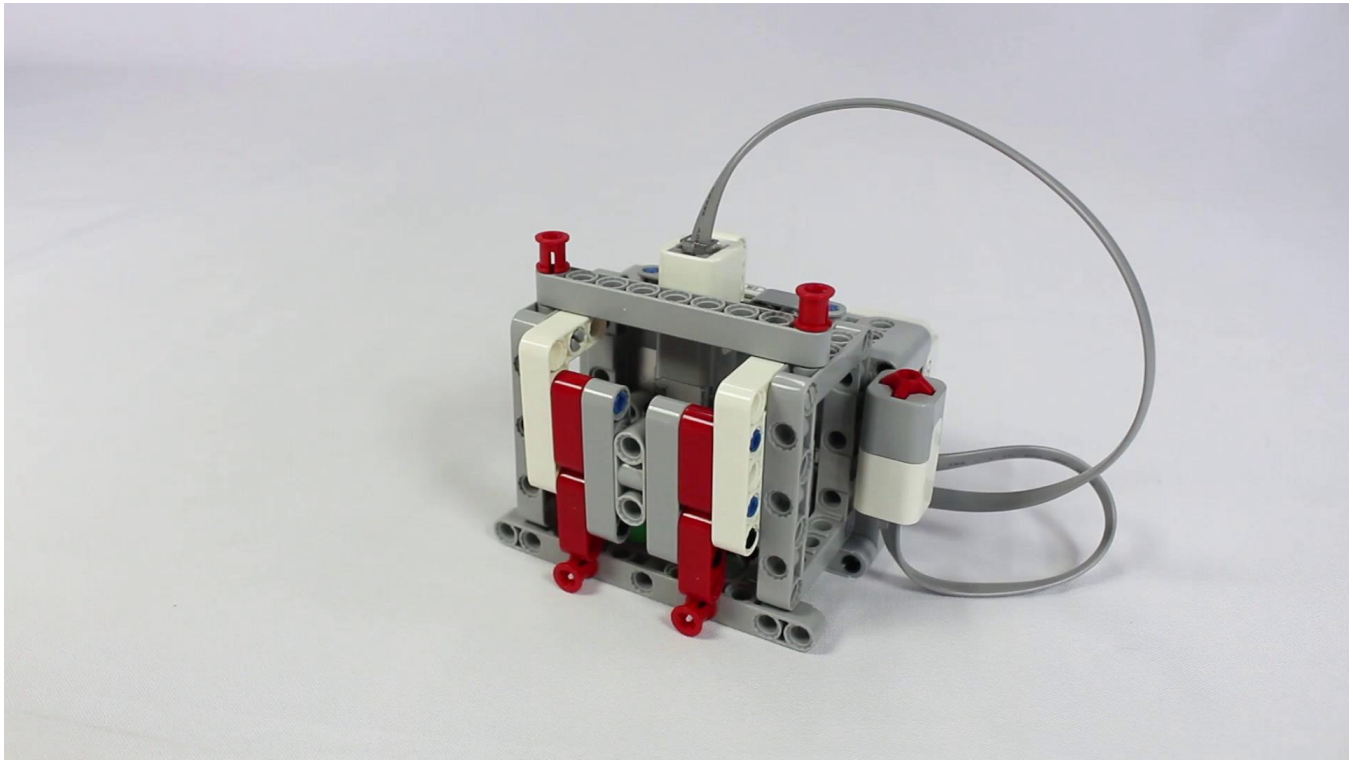
Practice | Programming

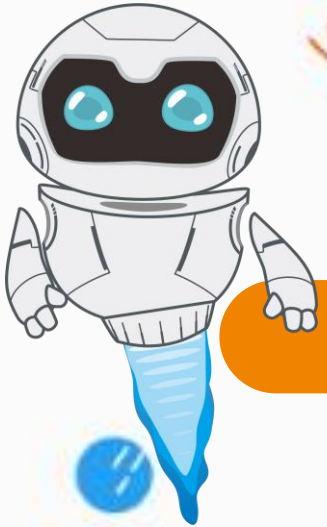


Judgment of Magnetic Pole

Changes in magnetic poles also sound the alarm.

Practice | Programming





Results

Reflect | Program Optimization

This lesson implements the function of a burglar-proof cabinet to sound an alarm when a magnetic object kept inside the cabinet is moved or rotated.

Next, modify the program to make the range of fluctuation of the difference more reasonable and create an exclusive alarm sound.

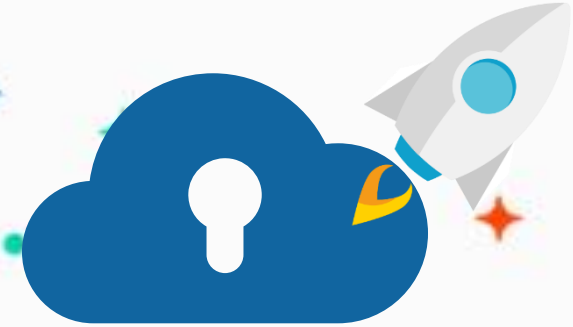
Requirements: Make adjustments to optimize the judgment range and make a specific alarm sound.

Reflect | Further Reading



With the development of the times, a variety of magnetic valuables can not be stored in ordinary safes, nor can they be used to determine whether they are stolen, and monitoring whether objects are moved is also unrealistic.

People for the external magnetic field is too large, the heat source is too strong or there is a strong source of vibration and other reasons caused by the demagnetization of the data phenomenon, the use of high-quality cold-rolled steel plate, internal professional anti-magnetic structure design, can effectively shield the magnetic field, blocking the heat source, so that the magnetic data storage more secure and reliable.



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Thanks!

LECTURER: XXX