Lesson 013 – Burglar alarm (advanced)

You need:

iTriangle online, PIR sensor, buzzer
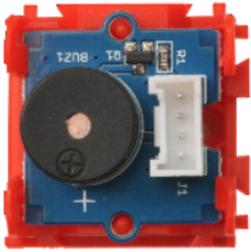
Buzzer	Push button switch	PIR motion sensor	
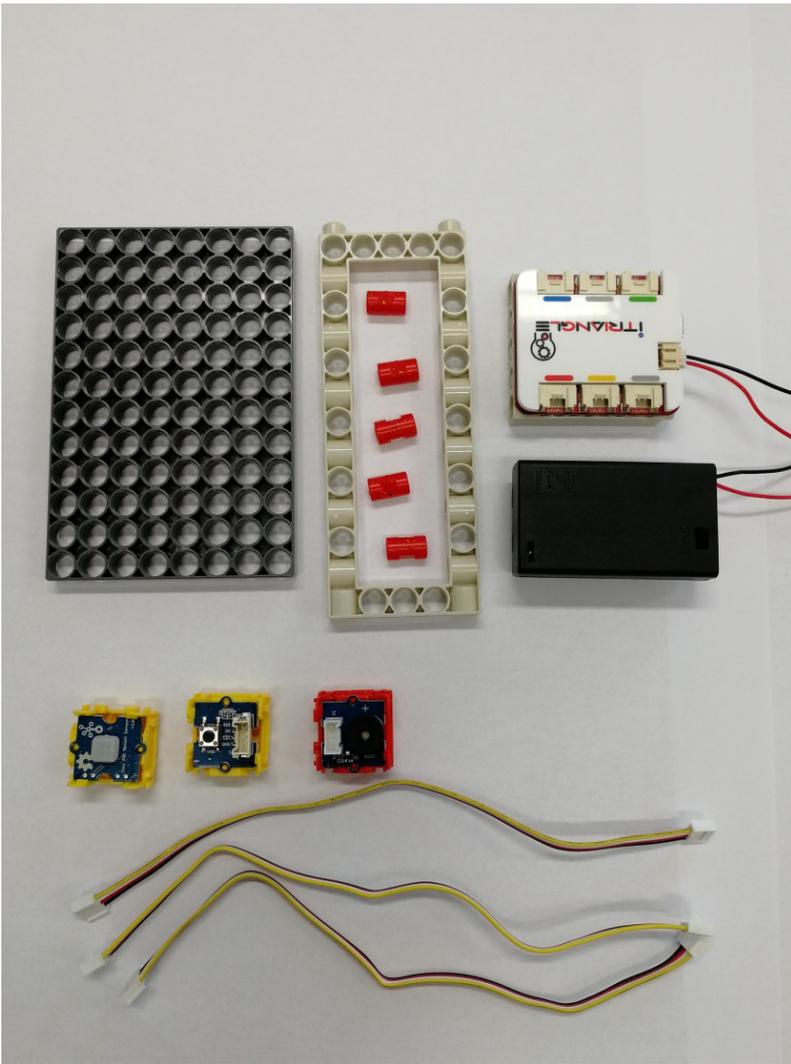
Introduction:

Infrared radiation is a part of the electromagnetic spectrum that is invisible to the human eye. All objects that have a temperature above -273.15 °C (0 Kelvin) emit this thermal radiation. The natural temperature of human is around 37 °C. People therefore emit a large amount of heat that can be measured by PIR motion sensor.

The PIR sensor measures temperature in different segments of its field of view. The temperature measured by each segment is individually evaluated and recorded for comparison with other segment measurements.

Task:

Use the motion detector (PIR sensor) that reacts to infrared light emitted by an object in motion. Construct a simplified version of a burglar alarm.

Tutorial:

1. Construct a simple stand with iTriangle online and connect the sensors and components as pictured below. Connect iTriangle online and upgrade its firmware by following these steps.
2. Choose the objects you want the alarm to detect.
3. Start the program.
4. To activate the burglar alarm, continuously press the push button switch until the buzzer produces two tones. The first tone is lower in pitch and second is higher. When you hear the second tone, release the push button switch. Now check what kind of objects it can detect. When the PIR sensor detects movement, the buzzer will play a melody as an alarm. You can deactivate the alarm by pressing the push button switch at any stage of the program – when you hear the high and low tones, you can release the push button switch and the alarm will be deactivated.
5. The program is initially set to operate for one minute only. This time can be extended by adjusting certain values in the program.
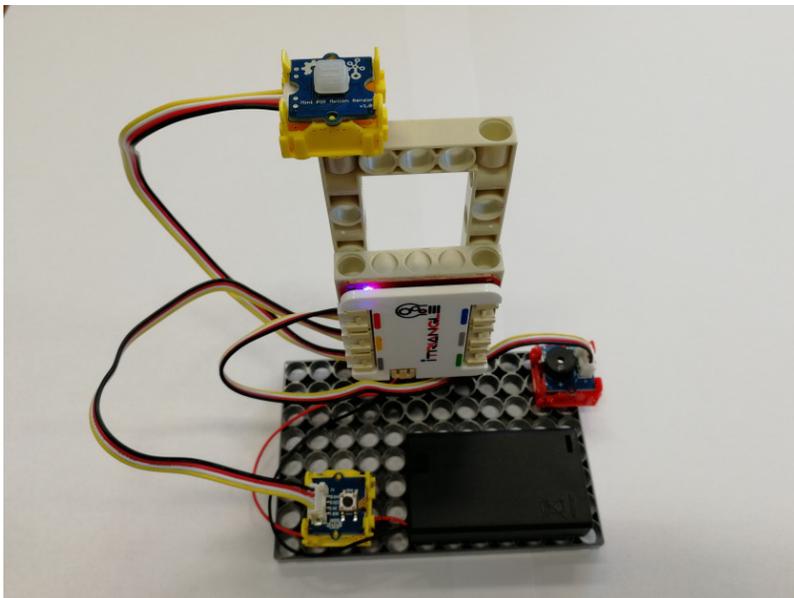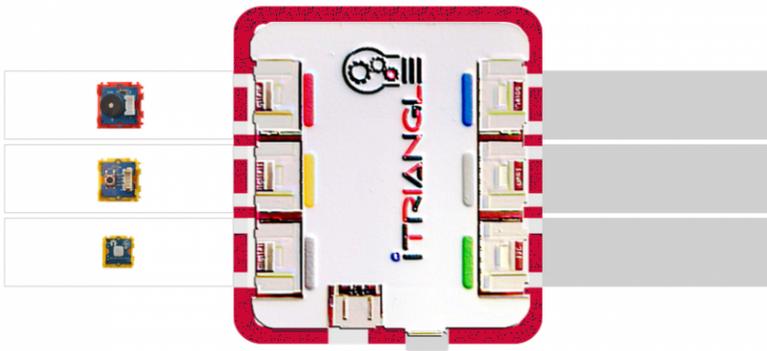
Extra mile:

Examples of good practice:

Technical notes:

The PIR sensor can detect state changes only over longer time periods. The recovery time between two consecutive detections is about 5 s.

Related tasks:

009