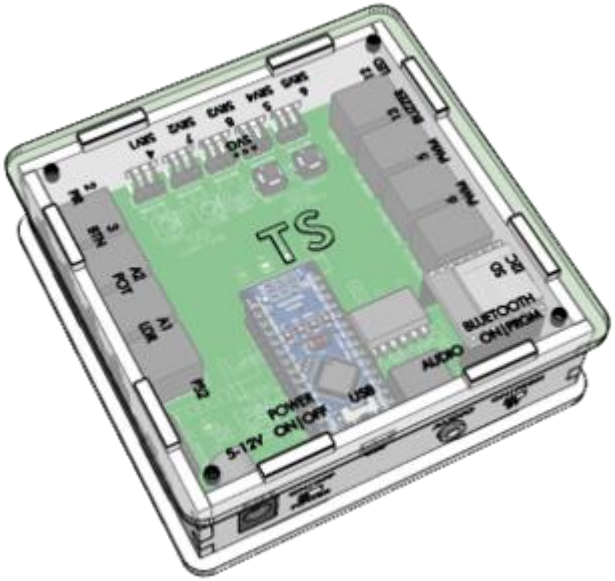


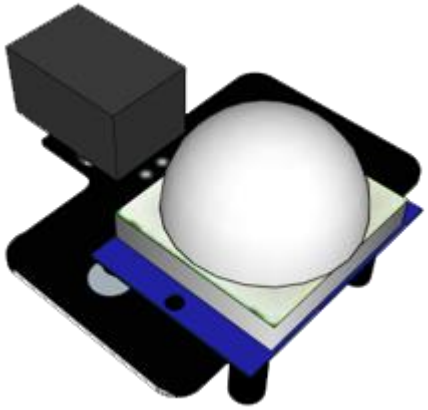
mBlock

TScratch Basics

Coding with mBlock (Software)

Learning Objective

In this lesson you will learn:



TScratch
(TSense PIR)

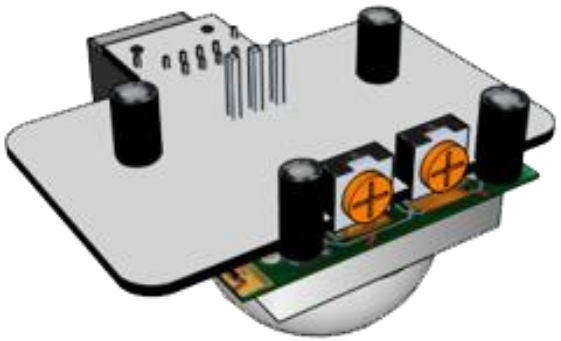
- Include a temperature-sensitive sensor to your project!
- Coding another Digital input with Arduino

What is a PIR?

- PIR is also known as the Proximity InFra-red sensor.
- It is a “switch” that works on motion/InFra-red .
- COOL(InFra-red absent) → Low Resistance (not working)
- HOT(InFra-red present)→ High Resistance (working)
- They are used commonly in security system, door chimes, etc.
- What is InFra-red?
  A spectrum of light that is not visible by naked eyes and commonly used with to detect heat signatures.
  (i.e. temperature sensing)

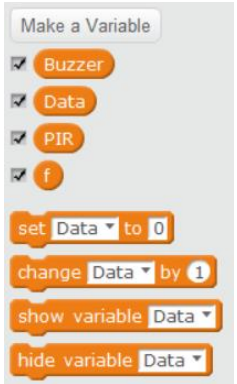
What is a PIR?

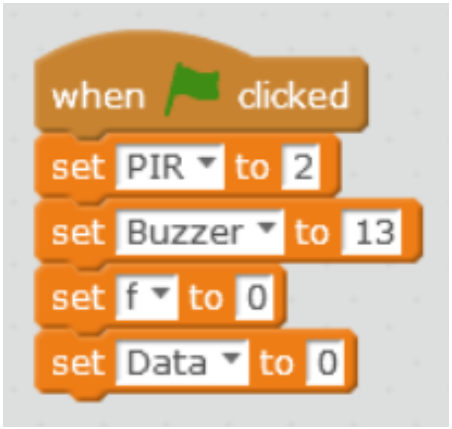
- The PIR should be tuned with the dome facing **DOWN**.
- Check that the distance and delay time knobs (orange) are tuned to the **LEFT.**
- Flat side of the orange knobs should be pointing in the **southeast** direction.



Write your PIR control program

- In this program, we will have a PIR **digital input (port 2)** and buzzer **digital output (port 13).** We will use a variable **f** (frequency) to set the notes for the buzzer, and variable Data to track the value of PIR.
- Create the respective variables in the Data&Blocks tab, then define them in the scripting area:



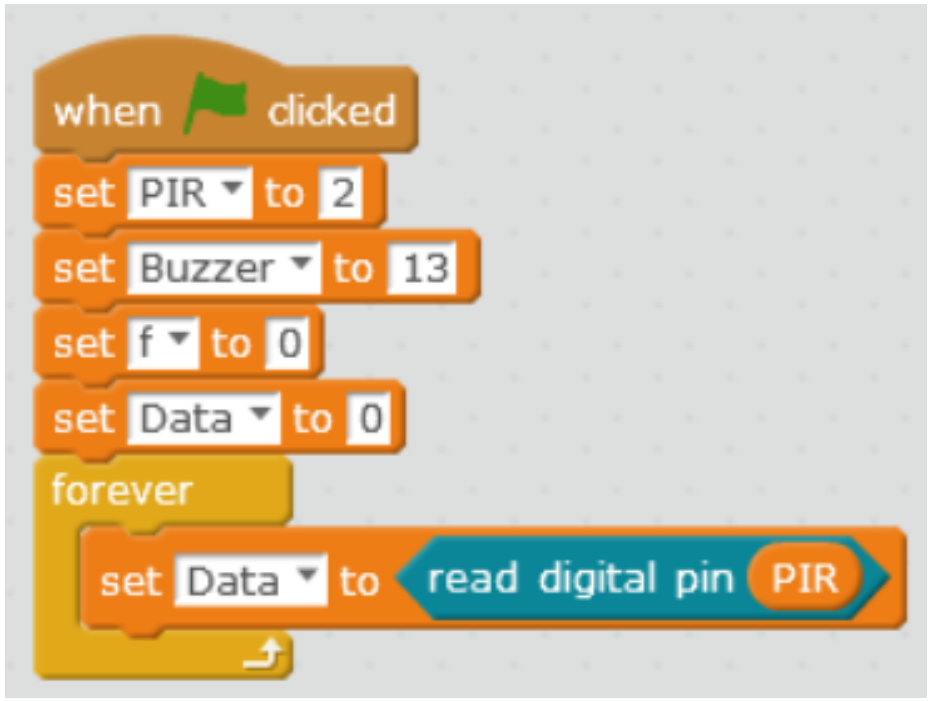


Write your PIR control program

- Within a forever loop, set your conditions.
- When the PIR sensor detects heat, play tone “f” on buzzer at beat 50, increasing **f** by 35 until it is more than 15000.
- When the PIR sensor doesn’t detect any heat, do nothing.
- PIR sensor detects → PIR = 1 (HIGH)
- Set buzzer play tone “f” on buzzer at beat 50, increasing **f** by 50 until it is more than 15000
- PIR sensor doesn’t detect → PIR = 0 (LOW)
- Buzzer does nothing

Write your PIR Program

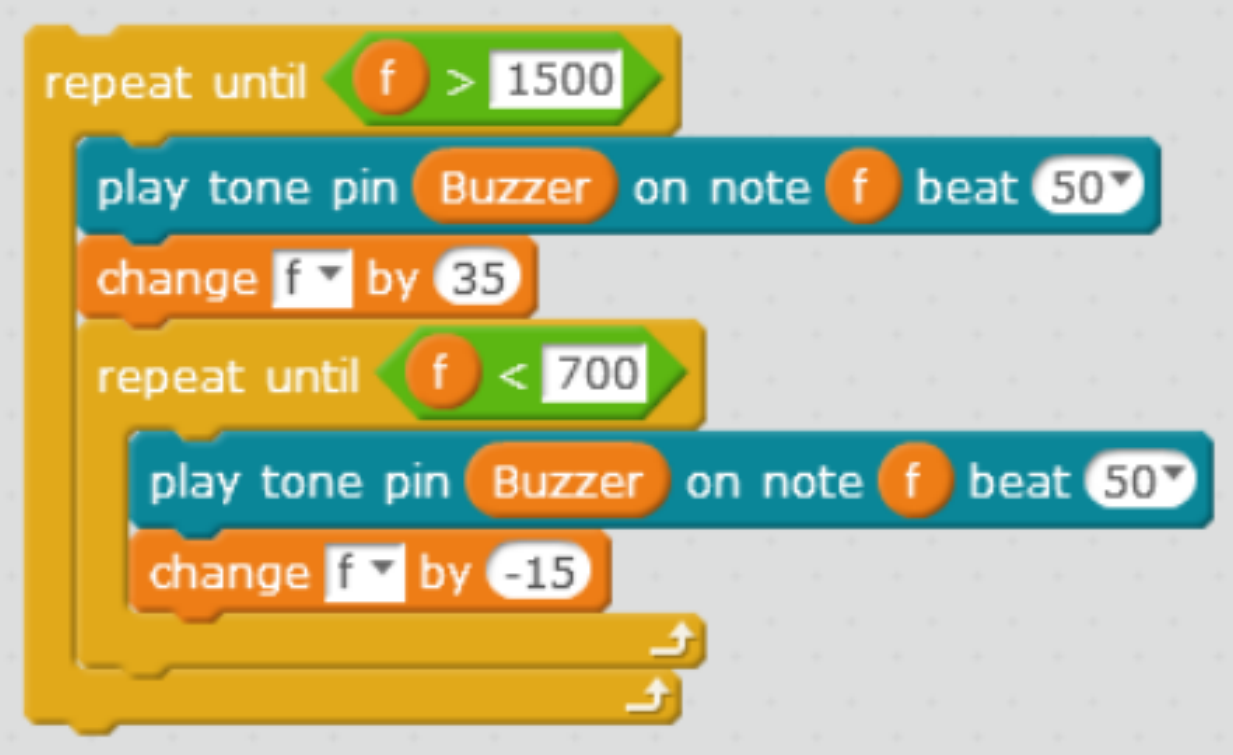
- Write a simple program to track and display the value of the PIR sensor using Data.



Note: By putting Data in a forever loop, the value of Data will constantly be updated

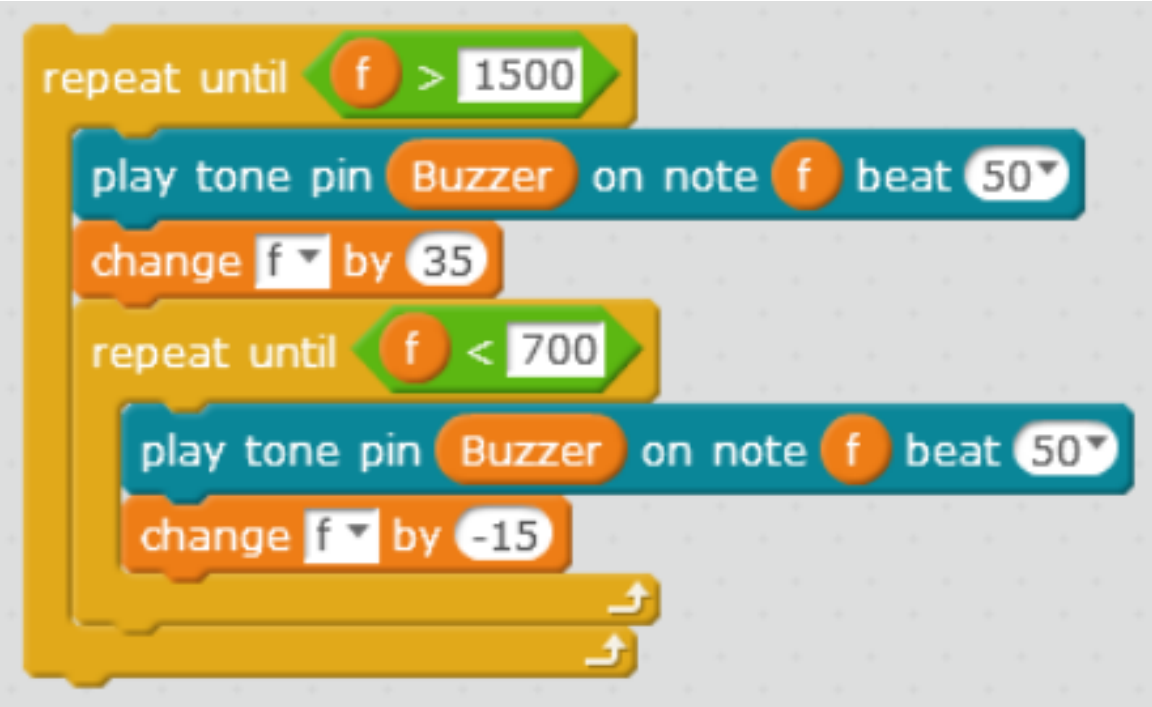
Write your PIR Program

- The alarm sound is created using the following series of tones:



Write your PIR Program

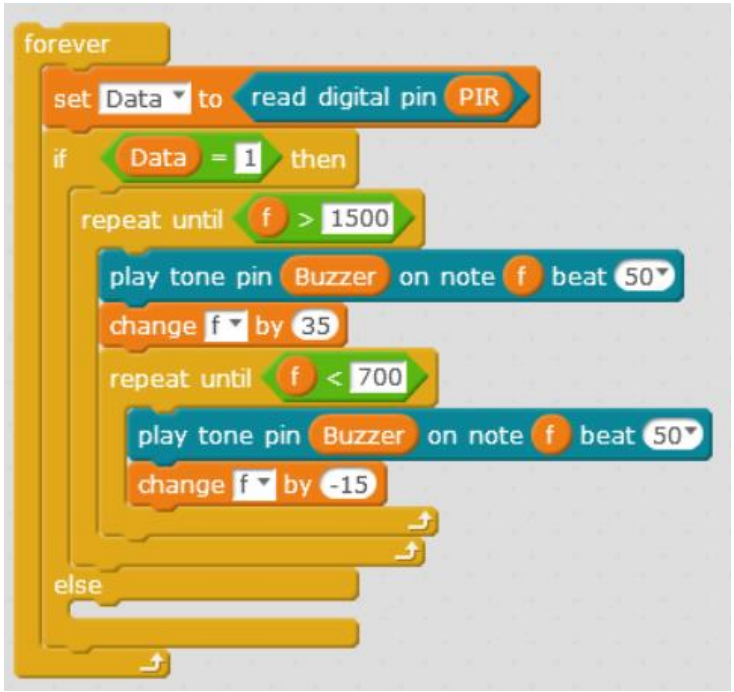
- The alarm sound is created using the following series of tones:



Note: to change the beat to 50, you have to click on the beat and manually type in 50

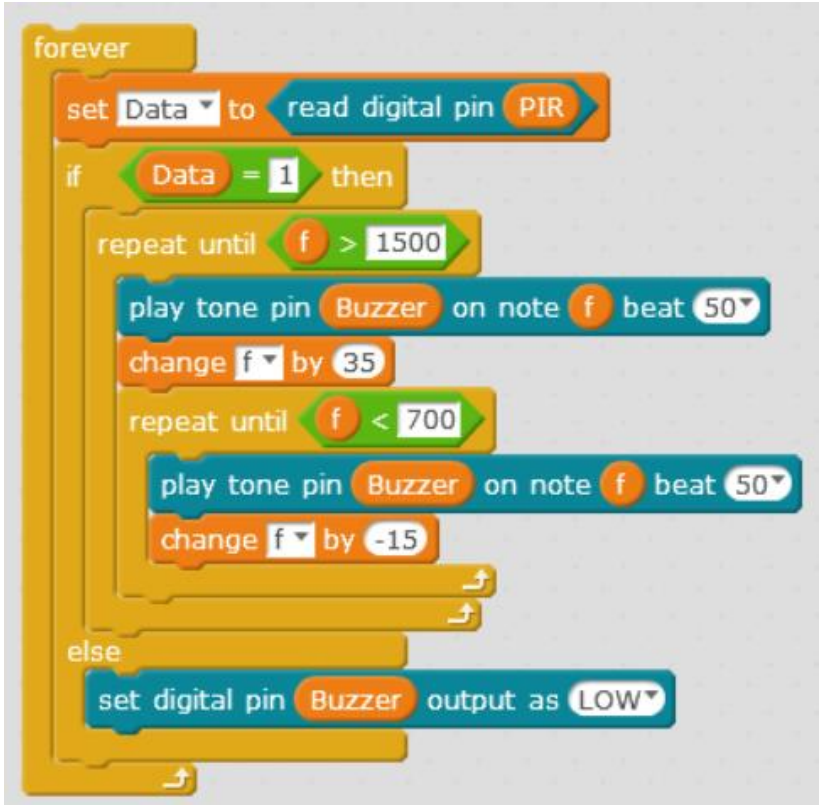
Write your PIR Program

- First, PIR sensor detects → Data = 1 (HIGH)
- Set the buzzer to play the alarm tone.
- Check if the PIR sensor is sensing any presence with the **if** block



Write your PIR Program

- Second, PIR sensor doesn't detect → Data = 0 (LOW)
- Switch the buzzer OFF.



Write your PIR Program

- Complete program

Note: You can use a cloth or cardboard box to shield the PIR sensor from any surrounding heat sources. Use Data to monitor the PIR detection status (Data = 1 means the sensor is detecting heat).