## Learning goals

* Create scripts and functions in Blockly.
* Learn and practice some of the programming basics:
  + Distance measurement using laser ping sensor
  + Turning ON/OFF LED lights based on the distance
  + Playing an alarm sound based on the distance

## Software and Hardware

* BlocklyProp Solo; Activity Board and Parallax USB programming cable
* Laser ping sensor
* Speaker

# Programming

* Create a script that:
  1. Reads laser ping sensor data in centimeters every 500 milliseconds and assigns it to a variable (e.g., distance); please note that the sensor is connected to pin 15.
  2. Prints distance in centimeters in the terminal with its unit (e.g., distance: 10 cm)
  3. Makes decisions based on the distance according to the table below:

|  |  |  |
| --- | --- | --- |
| No. | Conditions | Do |
| 1 | If distance ≥ 50 cm | Nothing (LED and speaker are OFF)  &  Print(“distance > 50”) in terminal |
| 2 | If 25 ≤ distance < 50 | LED connected to pin 26 blinks every 300 ms  &  Print(“25 ≤ distance < 50”) in terminal |
| 3 | If 10 ≤ distance < 25 | LED connected to pin 26 blinks every 100 ms  &  Print(“10 ≤ distance < 25”) in terminal |
| 4 | If distance < 10 | Keep the LED 26 ON  &  Print(“distance < 10”) in terminal  &  Play a sound (e.g., techloop.wav) with volume 10 |

* Save your code on your computer periodically.

Submit your code saved as ***Lab5\_YourInitials\_DescriptiveName*** *(e.g., Lab5\_AM\_ping\_speaker)*

# What to submit

* Submit your code saved as a \*.svg file.

# Instructions and hints

* The script should have two main blocks:
  + **Main block**
    - Run a function in a new processor to play music based on the distance. Please note that the function should repetitively check the distance and act accordingly. This will be similar to making LED ON/OFF in a new processor (check your code for that activity).
    - A continuous loop (use *repeat forever* block) to read the sensor data
      * Please note that the sensor is connected to **pin 15**.

Graphical user interface, application

Description automatically generated

* + - * Print the distance in the terminal.
      * Call a function that makes decisions based on the distance. You can call this function ‘parking\_assist’.
      * Pause for 500 milliseconds.
      * At the end of the loop, please clear the screen (use *Terminal clear screen* block)
  + **Your function block**, which
    - Makes decisions according to the above table.
    - Please note that you may want to make pin 26 low if the distance exceeds 50 cm.

Suggestion: First, make the LED blink based on the table. Once it works the way we expect, add playing music (alarm sound).

**Play Music**

* Download techloop.wav from Canvas, or you can download a sound from this library:

<https://learn.parallax.com/support/reference/sound-library>

* Paste the music files (.wav) onto the SD card of the activity board.
* Sample code to play music:

A screenshot of a computer

Description automatically generated with medium confidence

**Useful resources**

Play Music

<https://learn.parallax.com/support/reference/sound-library>

Propeller BlocklyProp Block Reference

<https://learn.parallax.com/support/reference/propeller-blocklyprop-block-reference>

* [Parking Assist BlocklyProp Project](https://learn.parallax.com/tutorials/language/blocklyprop/parking-assist-blocklyprop-project)
* [BlocklyProp reference PING))) Distance block](https://learn.parallax.com/support/reference/propeller-blocklyprop-block-reference/sensor/ping-distance)
* [True Colors Interactive Art Project with the LaserPING](https://learn.parallax.com/tutorials/language/blocklyprop/true-colors-interactive-art-project-laserping?_ga=2.190621544.2124006356.1651625574-1264960940.1644374482&_gac=1.136970500.1650136028.EAIaIQobChMIqOio3KOZ9wIVl8LCBB1n3wq9EAAYASAAEgJZg_D_BwE)
* [PING))) Wiring & Example Code](https://learn.parallax.com/support/reference/propeller-blocklyprop-block-reference/sensor/ping-distance/ping-wiring-example)
* [Sound library](https://learn.parallax.com/support/reference/sound-library)