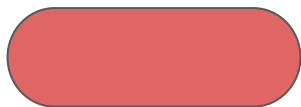
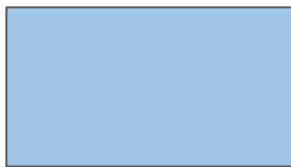


# 用圖來設想程式

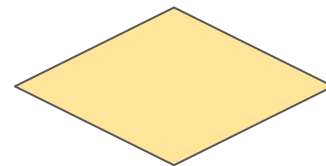
# 常用的圖示



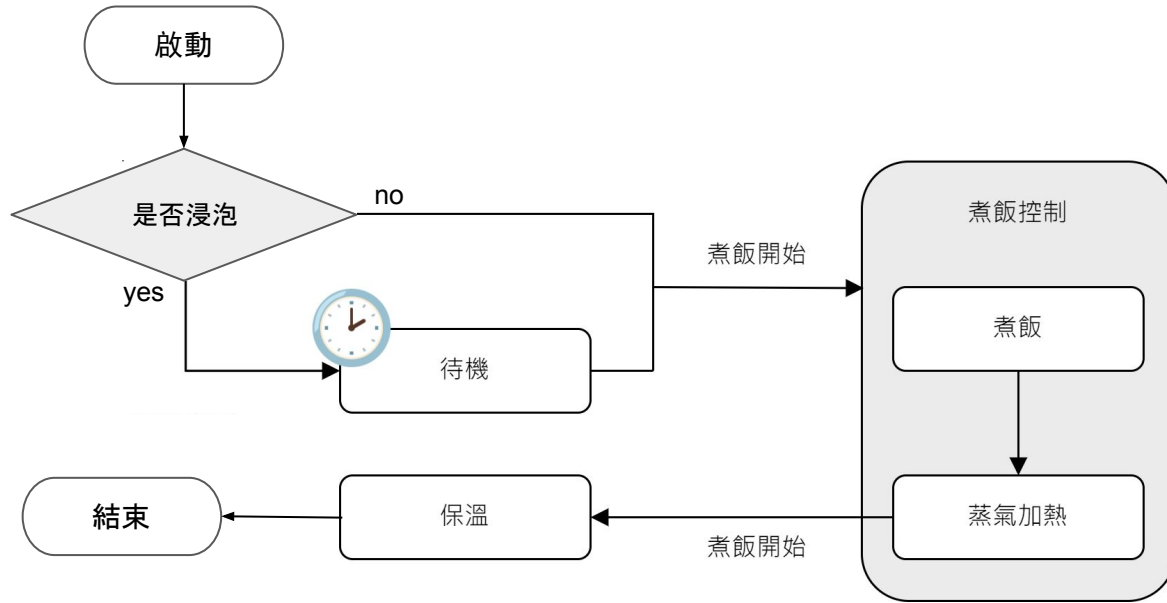
Termination  
開始/結束



Process  
處理



Decision  
決策



資料參考 (圖片重新繪製並客製化):  
草野俊彥(2019), [全圖解] 寫給所有人的運算思維入門, p19



Untitled Diagram.drawio

File Edit View Arrange Extras Help Last change 1 minute ago

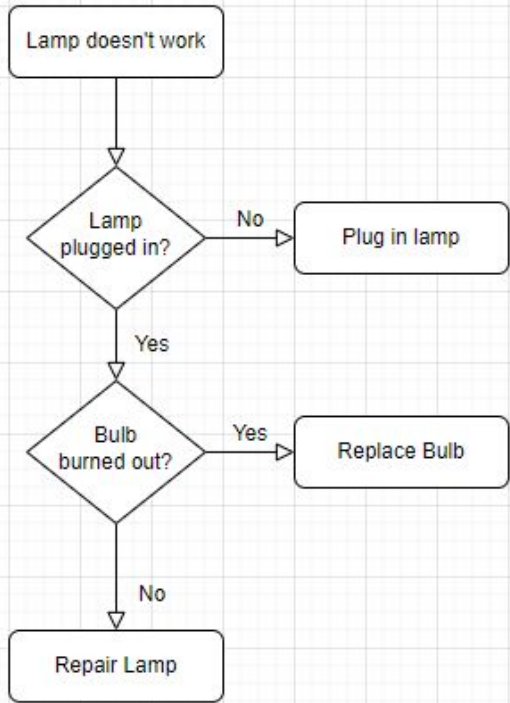


Search Shapes

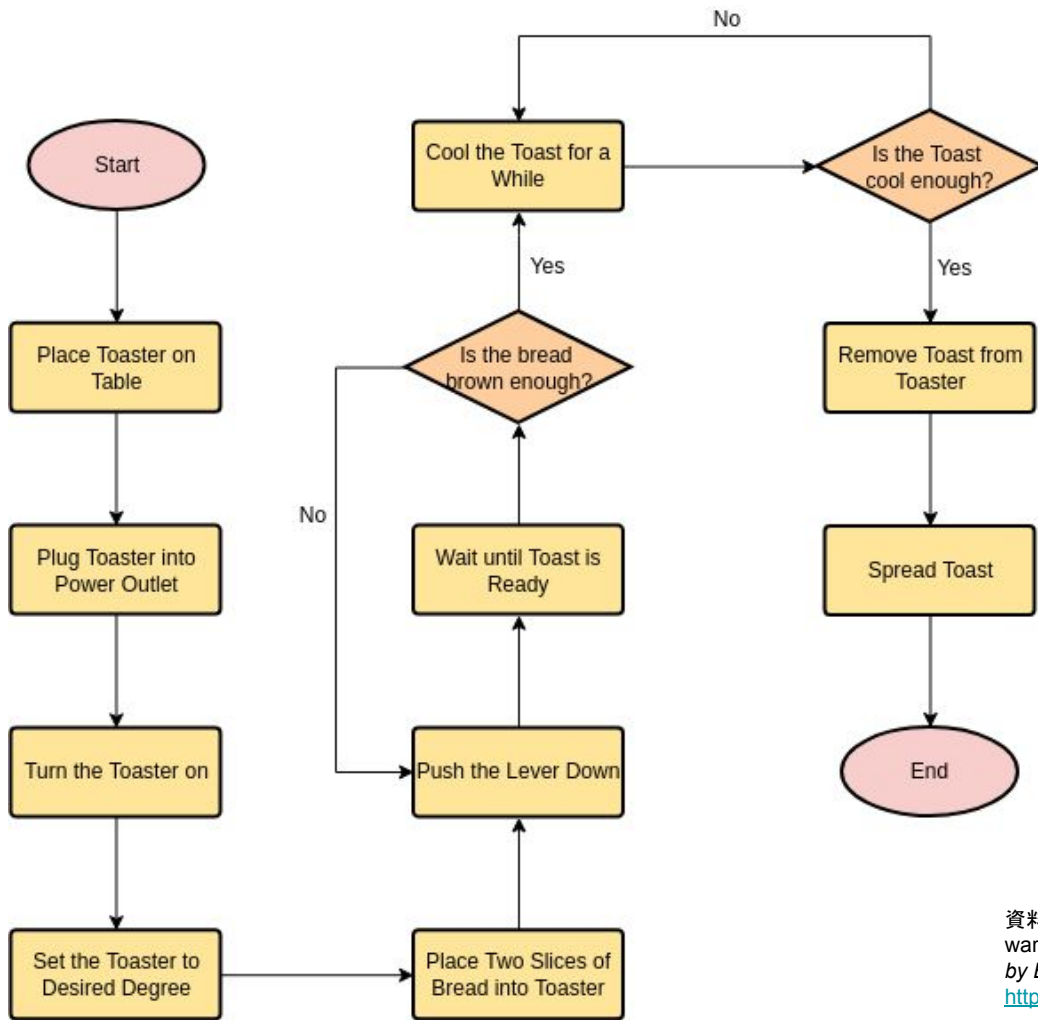
Scratchpad ? + ✎ ✕

Drag elements here


General



資料來源：  
取自 draw.io <https://draw.io/>



資料來源：  
 warren2lynch(2018), 流程圖示例學習 / Learning Flowchart  
 by Example - 製作烤麵包過程, 取自 iT 邦幫忙網站  
<https://ithelp.ithome.com.tw/articles/10198588>

 Function(函數)就是一台機器



**CoffeeMachine(water, beans)**

函數(Function)，是一部機器；  
參數(Parameter)，是機器運作時需要的原料。

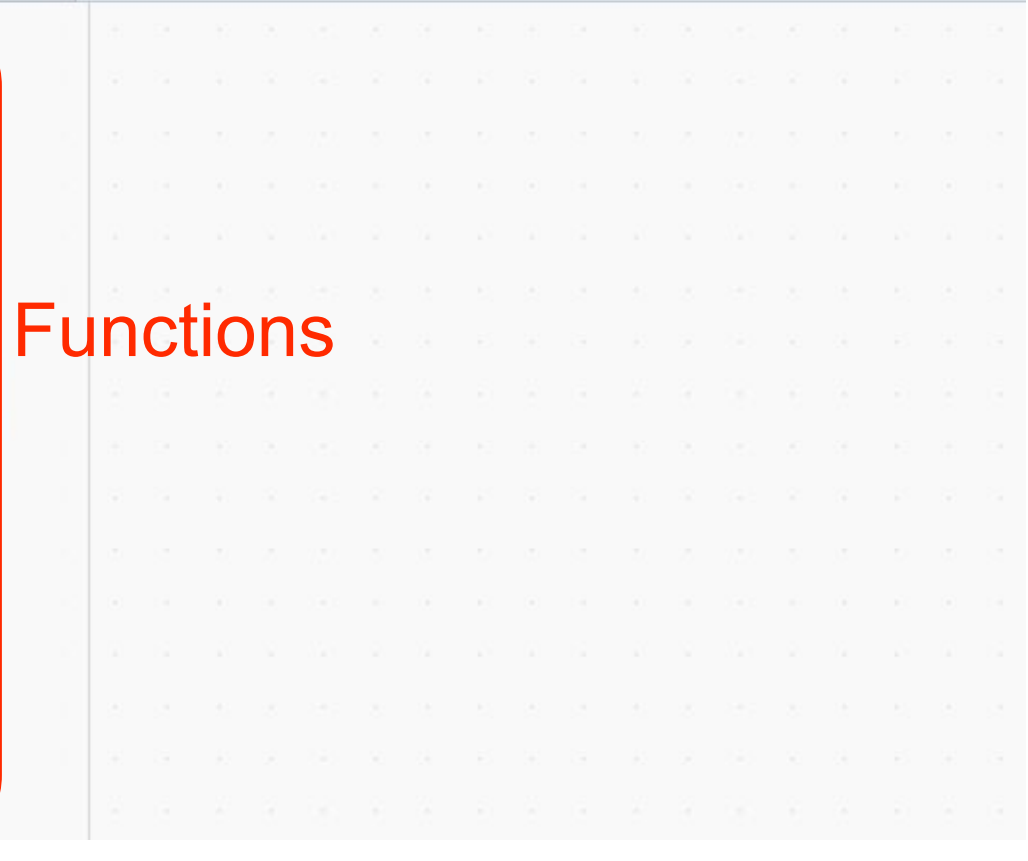


小智教練

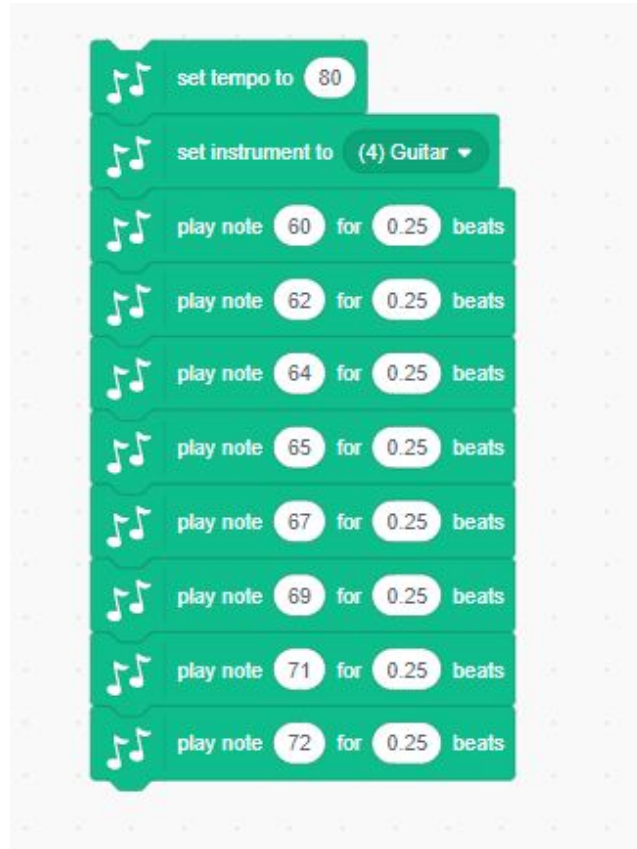
**Sensing**

- touching mouse-pointer ?
- touching color ?
- color is touching ?
- distance to mouse-pointer
- ask What's your name? and wait
- answer
- key space pressed?
- mouse down?
- mouse x
- mouse y

# Functions

A large, empty grid workspace for creating a Scratch project, consisting of a light gray background with a faint grid pattern.





資料來源：  
CS50's Introduction to Programming with Scratch網站：  
<https://cs50.harvard.edu/scratch/2021/weeks/2/>

The image displays a screenshot of a music creation software interface, likely Soundation. The interface is divided into several sections:

- Left Panel:** Contains a sidebar with various tool categories such as "Drums", "Bass", "Keys", "FX", "MIDI", "Audio", "Effects", "Mix", and "Master". Below these are sections for "Favorites", "My Music", and "Recent".
- Center Area:** Features a block-based programming environment with a grid of colored blocks (yellow and green) representing musical notes and chords. Below the blocks is a musical score with two staves (treble and bass clef) showing the generated melody and accompaniment. The score includes chord symbols (C, D, F) and fingerings (e.g., 3, 4, 2, 1).
- Right Panel:** Contains a "Mixer" section with volume and pan controls for different tracks, and a "Master" section for overall audio processing.
- Bottom:** Shows a standard Windows taskbar with various application icons and a system tray.



資料來源：  
CS50's Introduction to Programming with Scratch網站：  
<https://cs50.harvard.edu/scratch/2021/weeks/2/>

The image displays a Scratch project with a script on the left and a stage on the right. The script, highlighted in yellow, begins with a 'when clicked' event, followed by 'erase all', 'set pen color to green', and 'set pen size to 2'. It then moves the pencil to x: -200, y: 130 and points it in direction 90. A 'forever' loop contains 'pen down', a 'repeat 4' block with 'repeat 5' nested inside, 'move 10 steps', 'turn 90 degrees', and 'change y by -10'. The stage shows a coordinate grid with a green staircase pattern. The origin is (X:0, Y:0). The pattern starts at (X:-240, Y:0) and ends at (X:0, Y:-180). The x-axis is labeled with -200, -100, 100, and 200. The y-axis is labeled with 100 and -100. A pencil sprite is positioned at the end of the pattern. The stage interface shows the 'Pencil' sprite selected, with its position at x: 174, y: -114, size 30, and direction 90. The 'Backdrops' panel shows '2' backdrops.

```
when clicked
  erase all
  set pen color to green
  set pen size to 2
  pen up
  go to x: -200 y: 130
  point in direction 90
  forever
    pen down
    repeat 4
      repeat 5
        move 10 steps
        turn 90 degrees
      change x by 10
      change y by -10
```