COCOROBO

AI for STEM Competition

Asia Pacific STEAM_AI Technology Innovation Challenge

03 Screen Display, Motors and Servos

CocoRobo

COCOROBO

目錄

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CHAPTER

ONE.

Platform Use

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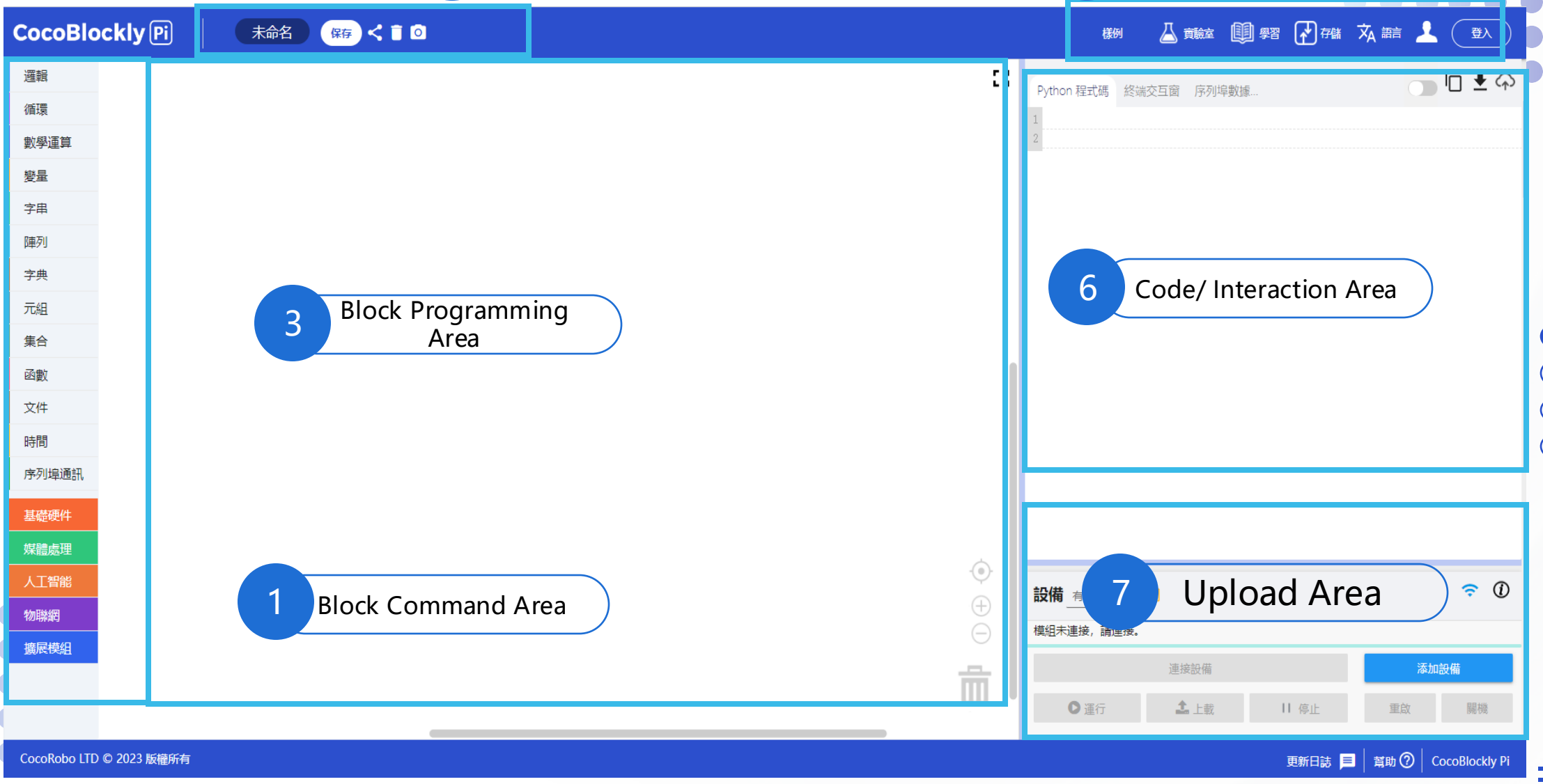
02 Platform Use

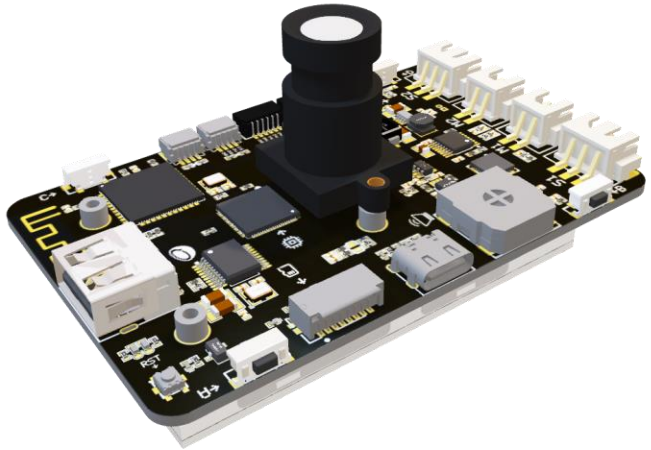
https://pi.cocorobo.hk/

02

Platform Use

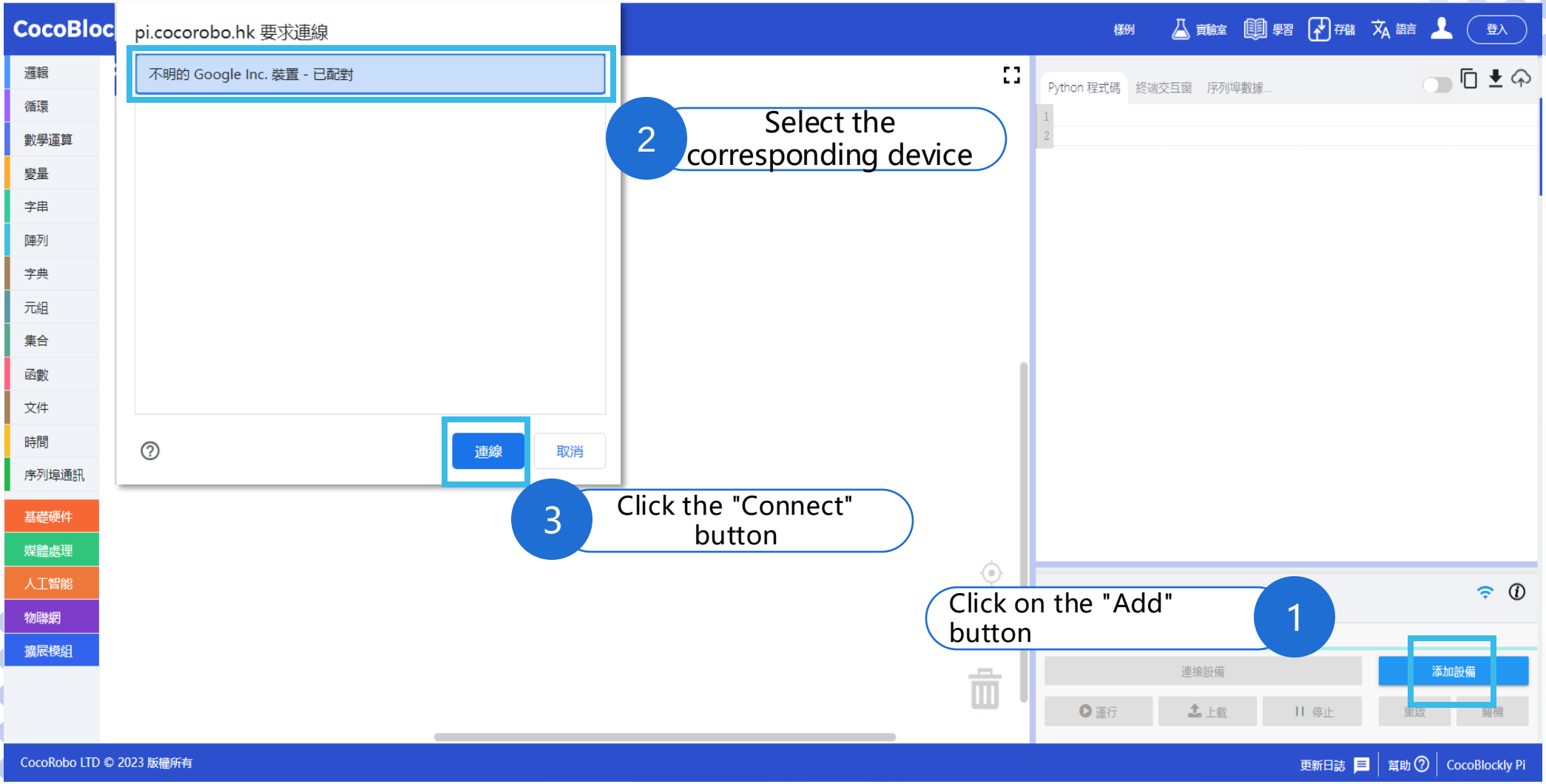


02 Platform Use

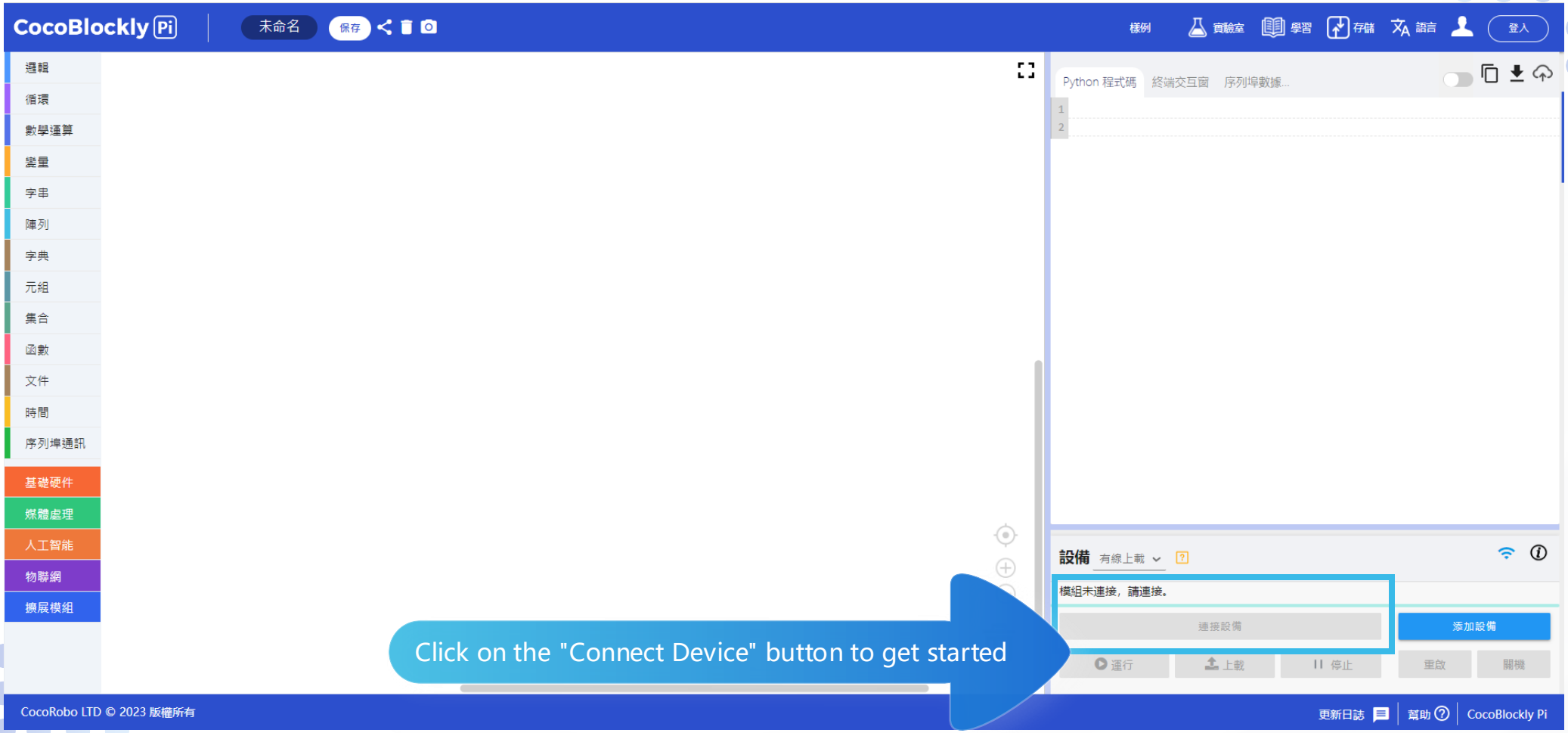


Use a Type-C cable to connect the Cocopi module to the computer

02 Platform Use



02 Platform Use



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CHAPTER TWO

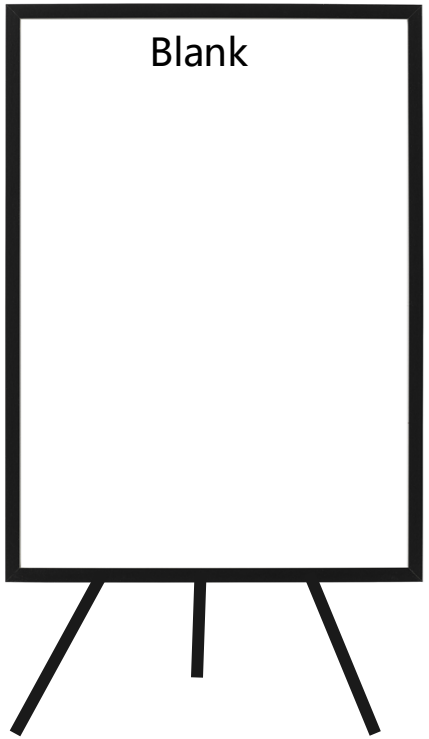
TWO.

Image Drawing

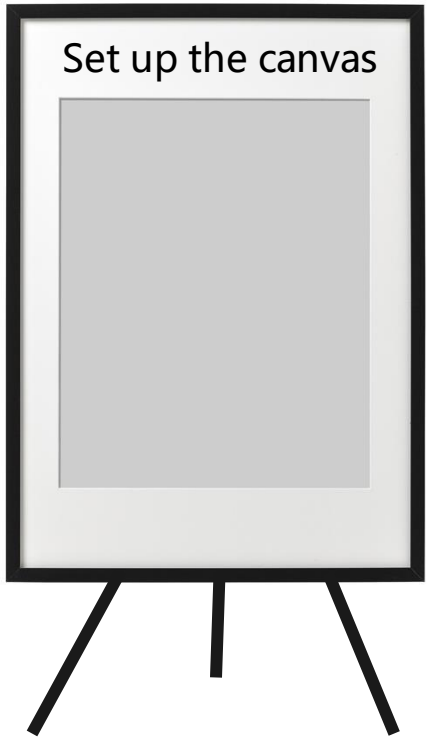
CHAPTER

Image Drawing

Screen

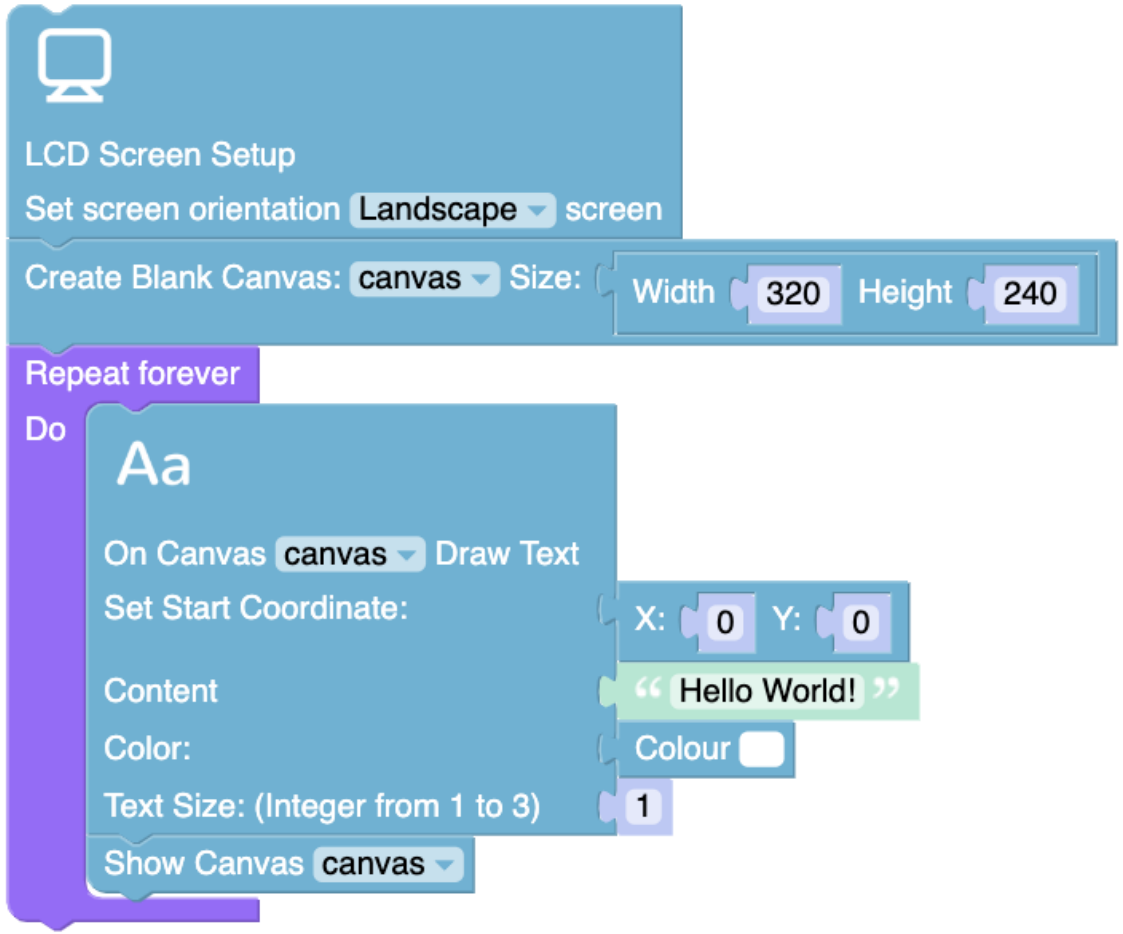


Create a canvas



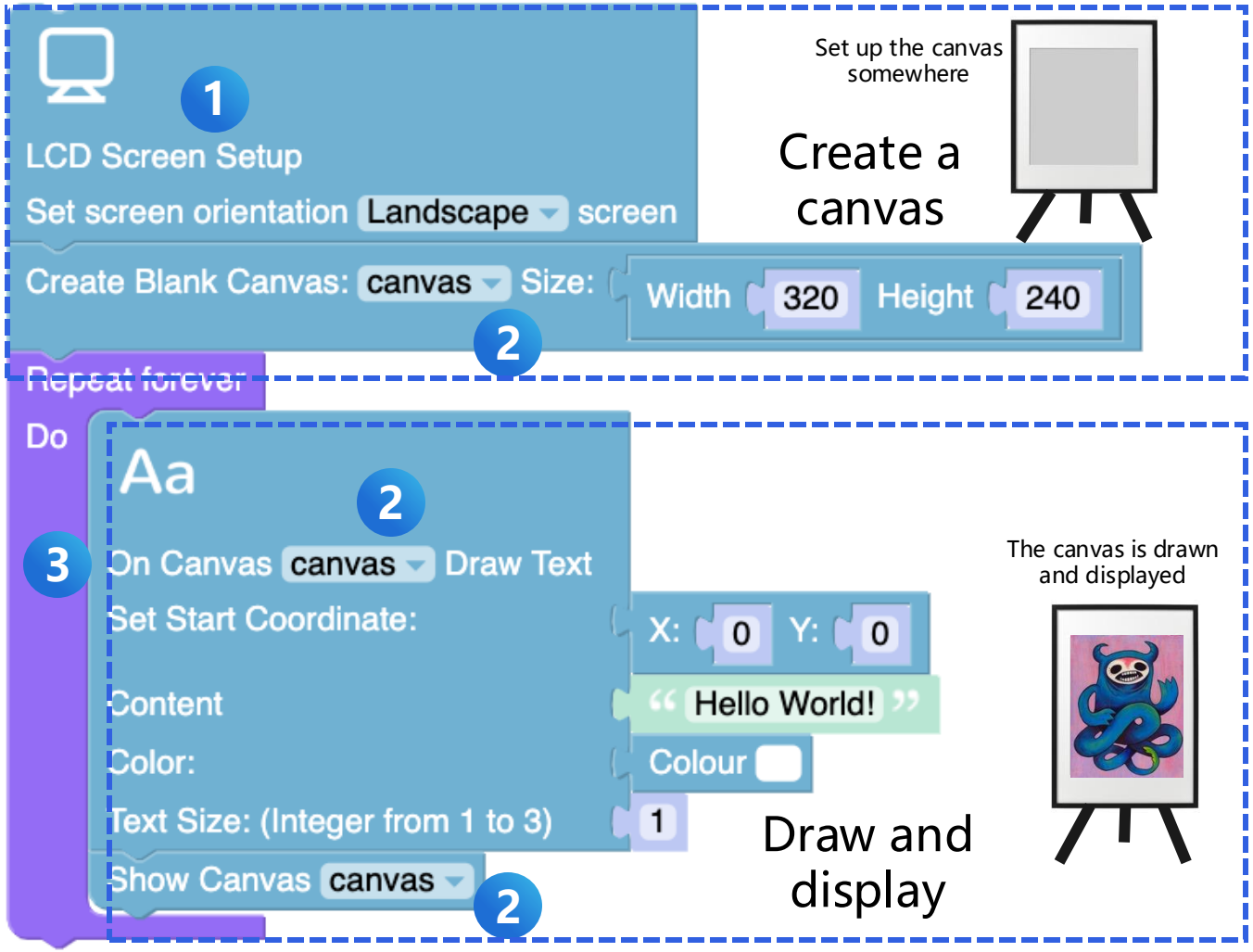
Draw and display

Image Drawing



Observe the program on the left and talk about what it consists of.

Image Drawing



1. Screen setup
2. Canvas
3. Repeat

Image Drawing

The role of the canvas

Original screen image

The figure drawn by canvas 1 is 

The figure drawn on canvas 2 is 小熊

Role 1

Move multiple shapes on the same canvas together

Role 2

Resize multiple graphics on the same canvas together

Role 3

Clear multiple shapes on the same canvas together

Image Drawing

Activity 1: Draw a solid square in the middle of the screen with a size of 50*50 pixels and make it green colour

On-screen introduction

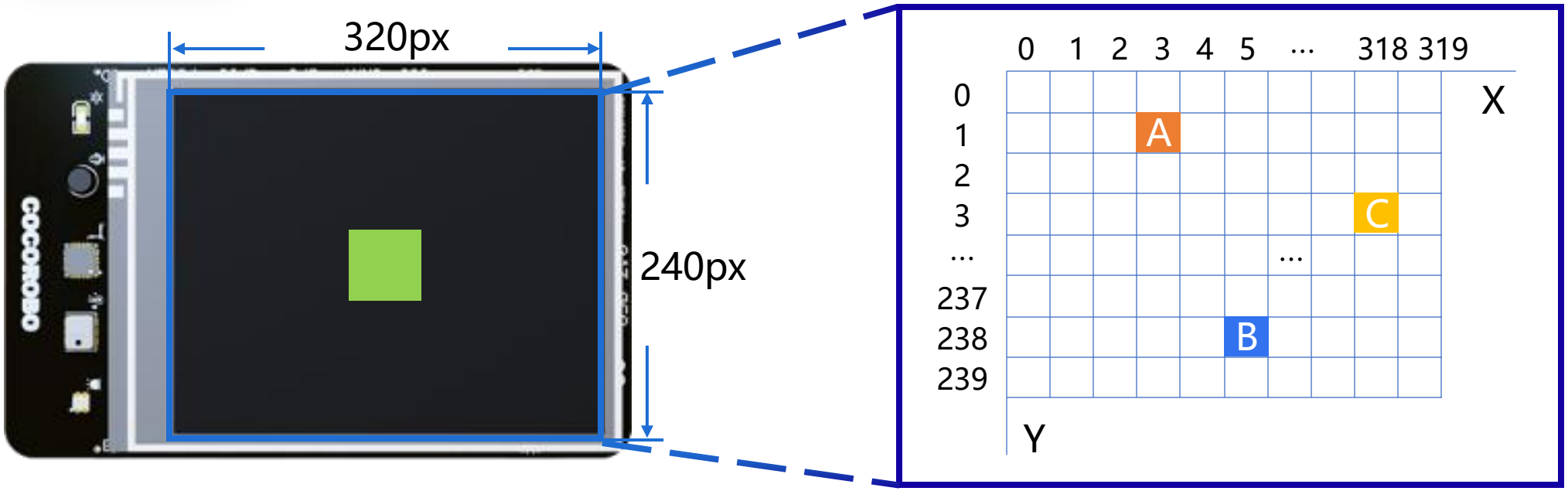


Image Drawing

Activity 1: Draw a solid square in the middle of the screen with a size of 50*50 pixels and make it green colour

Process analysis

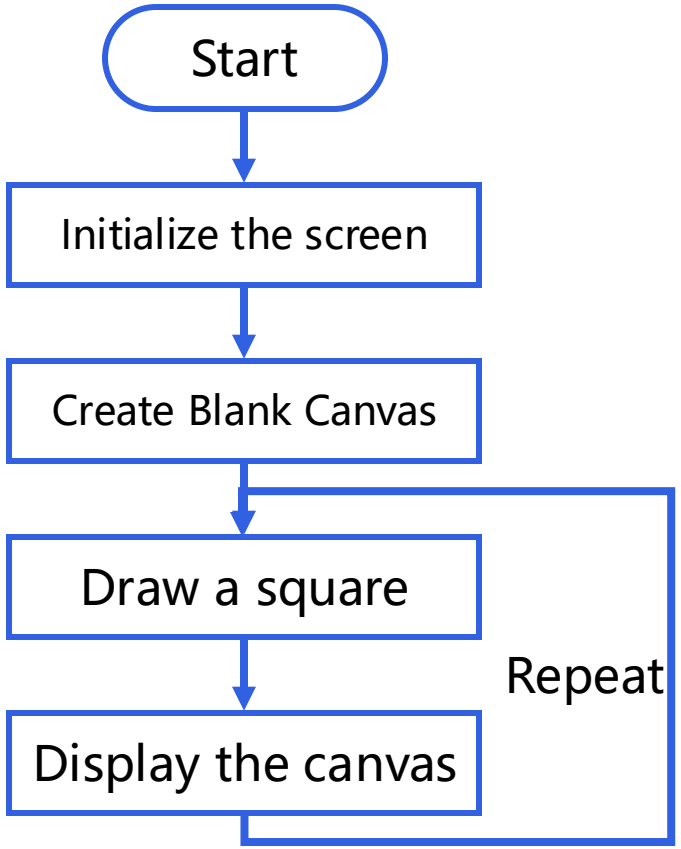
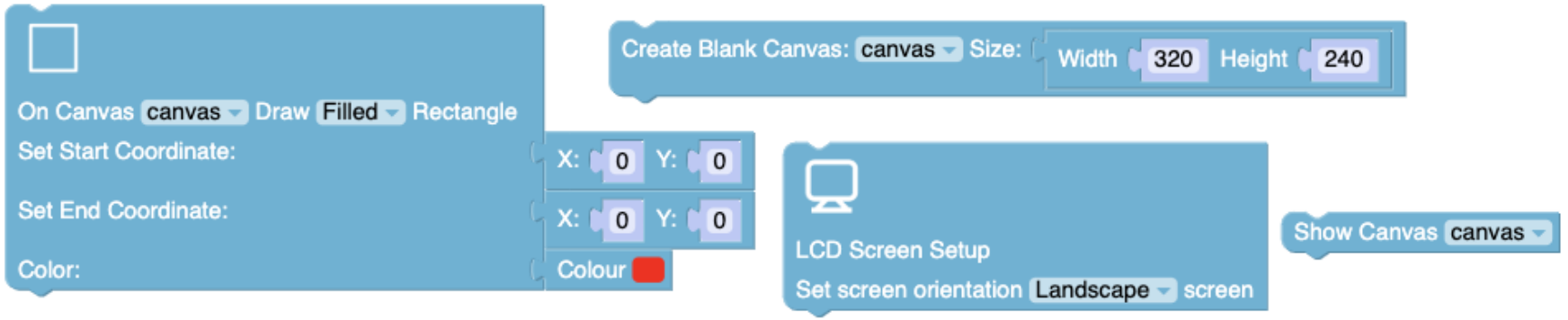


Image Drawing

Activity 1: Draw a solid square in the middle of the screen with a size of 50*50 pixels and make it green colour

Usage of Block Codes

Screen



Loops

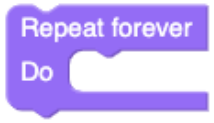


Image Drawing

Activity 1: Draw a solid square in the middle of the screen with a size of 50*50 pixels and make it green colour

Block Explanation

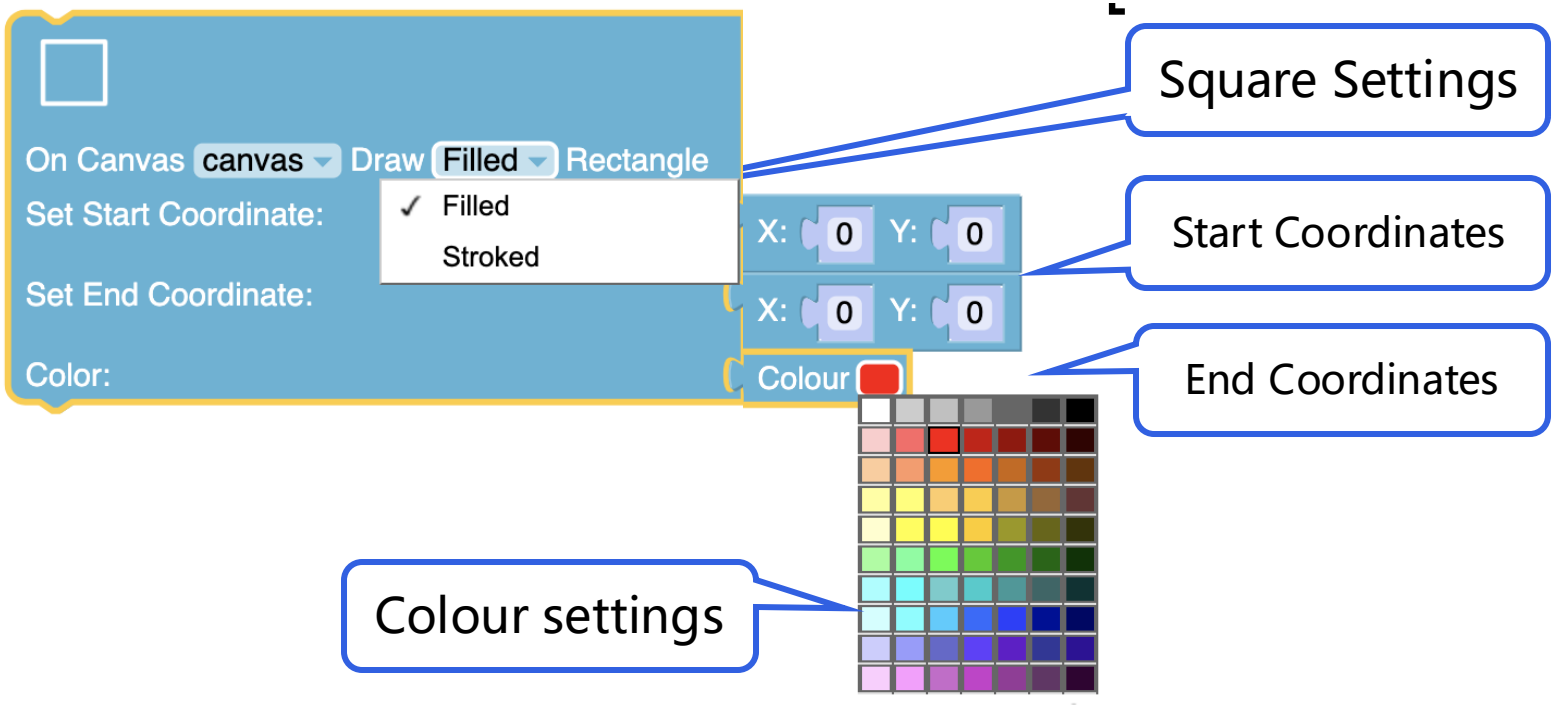


Image Drawing

Activity 1: Draw a solid square in the middle of the screen with a size of 50*50 pixels and make it green colour

System Reference

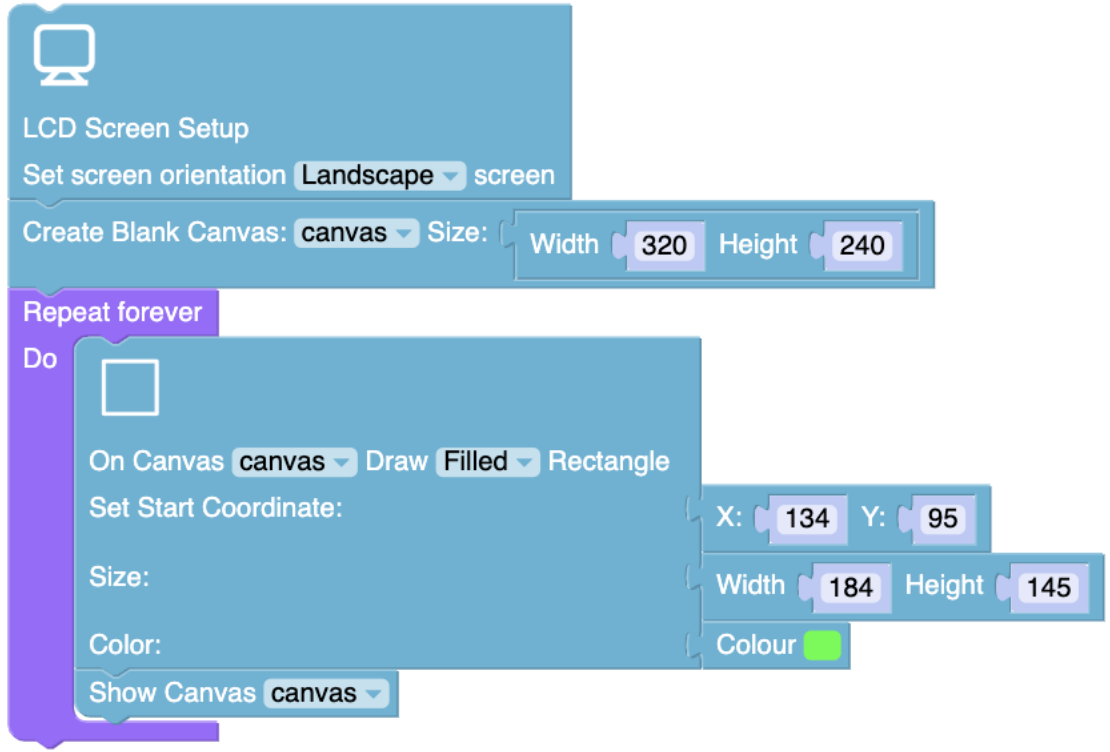
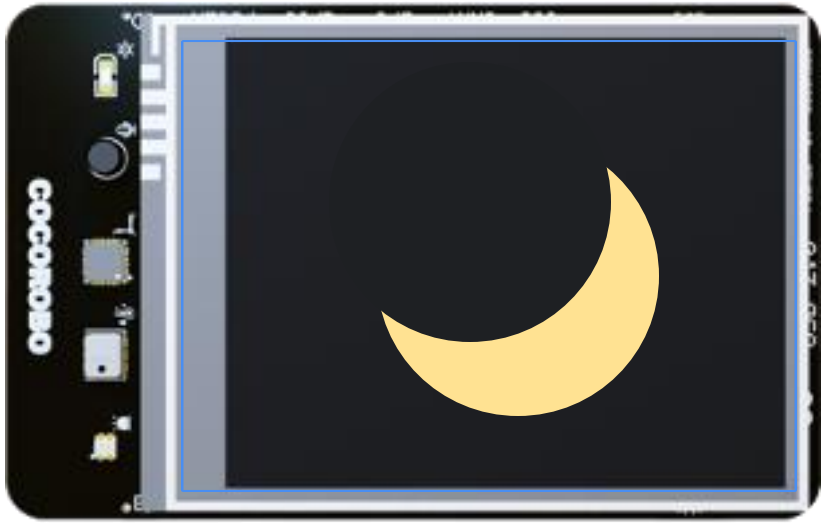


Image Drawing

Activity 1 (Bonus)

Try to finish drawing the following graphic on the screen:

You can also get creative!



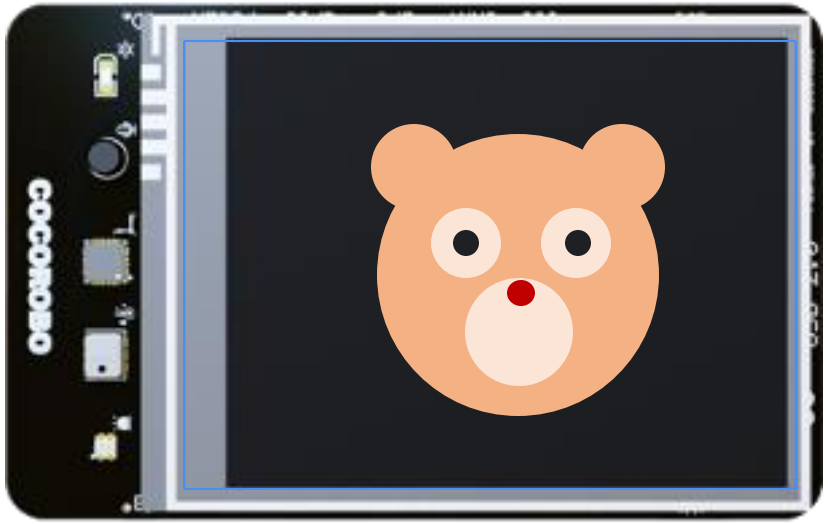
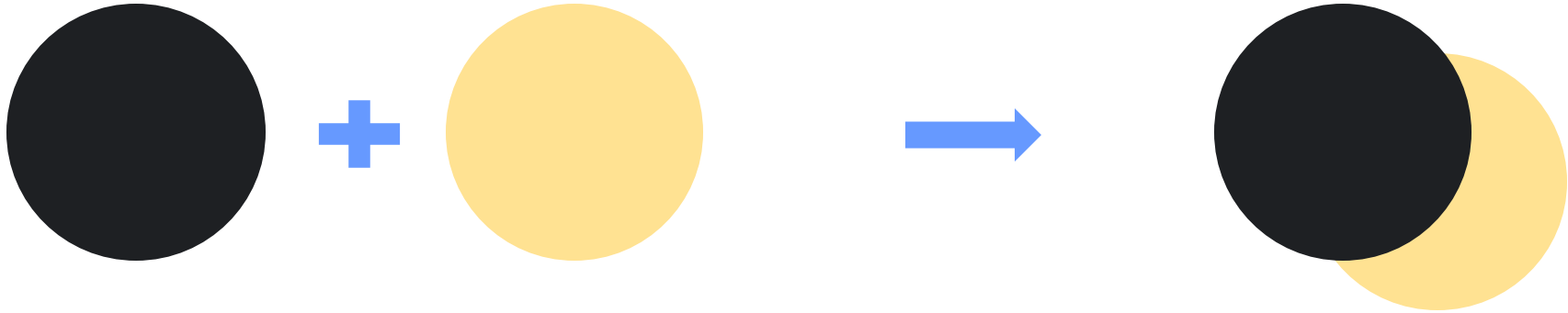


Image Drawing

Activity 1 (Bonus)

Try to finish drawing the following graphic on the screen:

Reference Ideas



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CHAPTER

THREE.

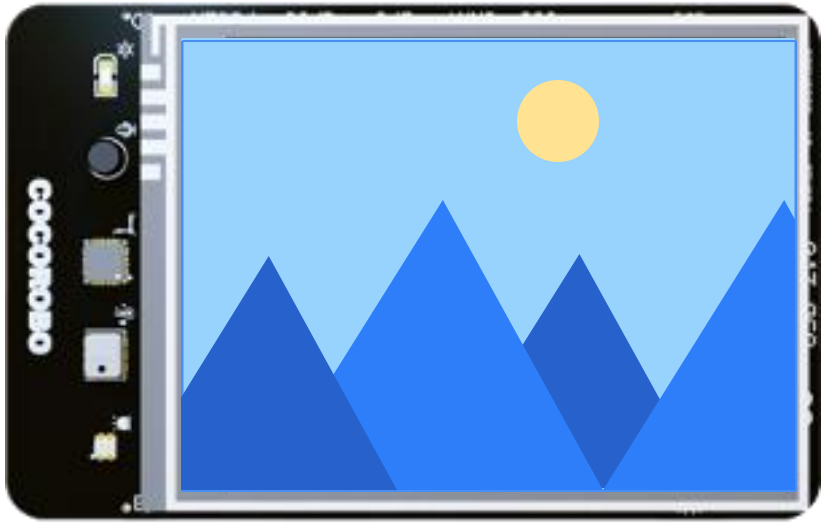
Camera Screen Display

CHAPTER

Camera Screen Display

Activity 2: Take a picture and keep it on the screen

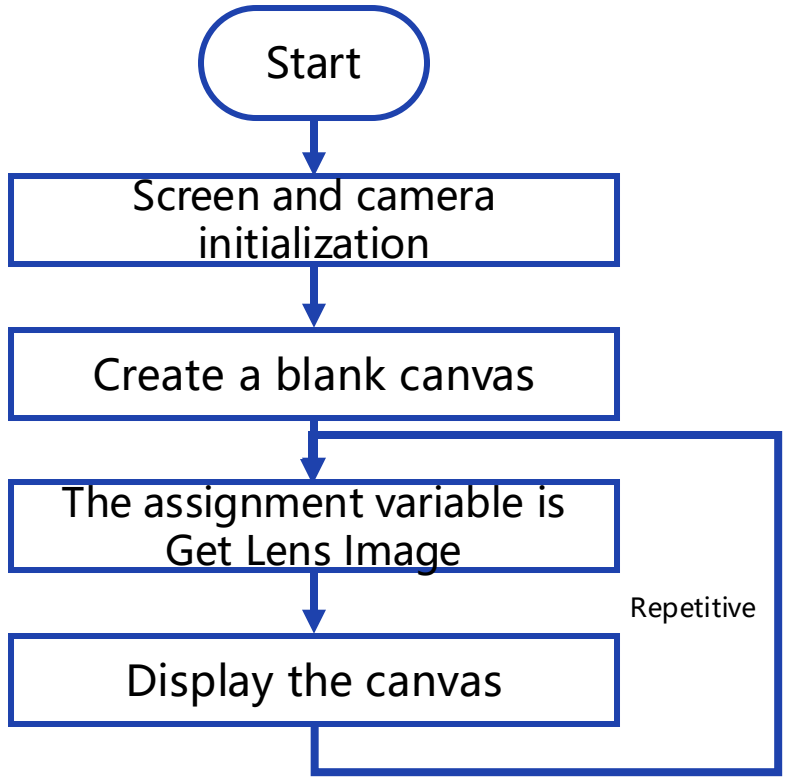
Effect



Camera Screen Display

Activity 2: Take a picture and keep it on the screen

Process analysis



Camera Screen Display

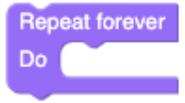
Activity 2: Take a picture and keep it on the screen

Blocks Used

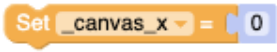
Screen

Camera

Loops



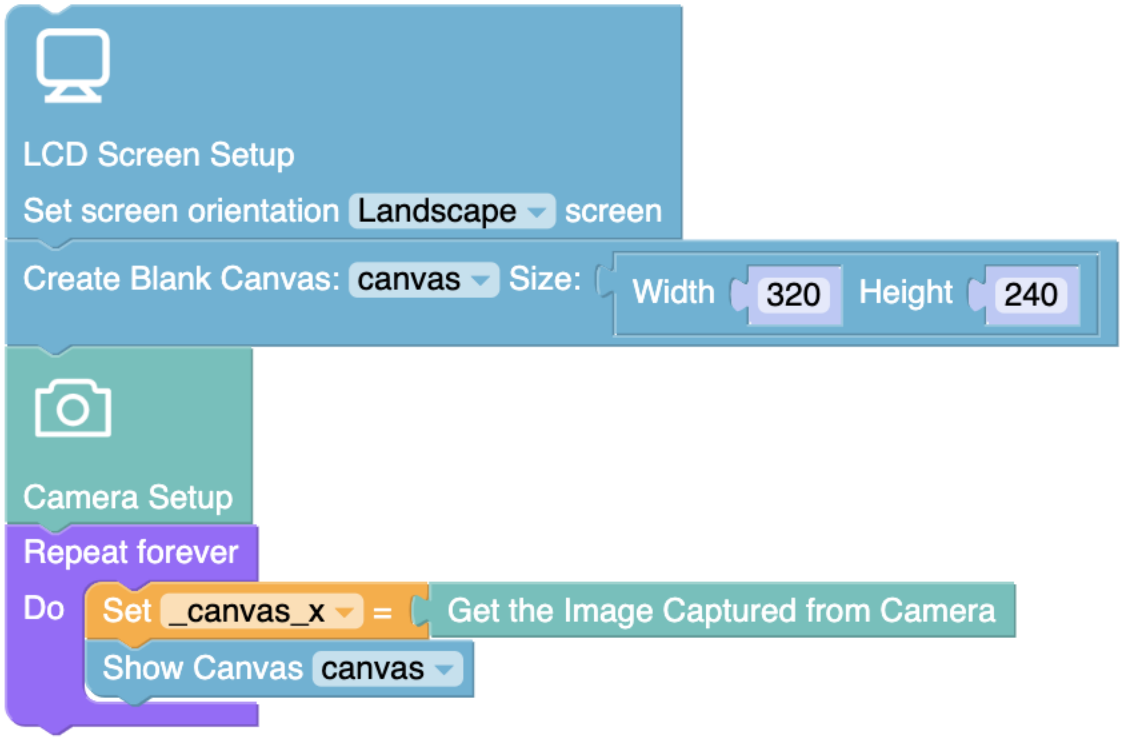
Variables



Camera Screen Display

Activity 2: Take a picture and keep it on the screen

Block Assembly



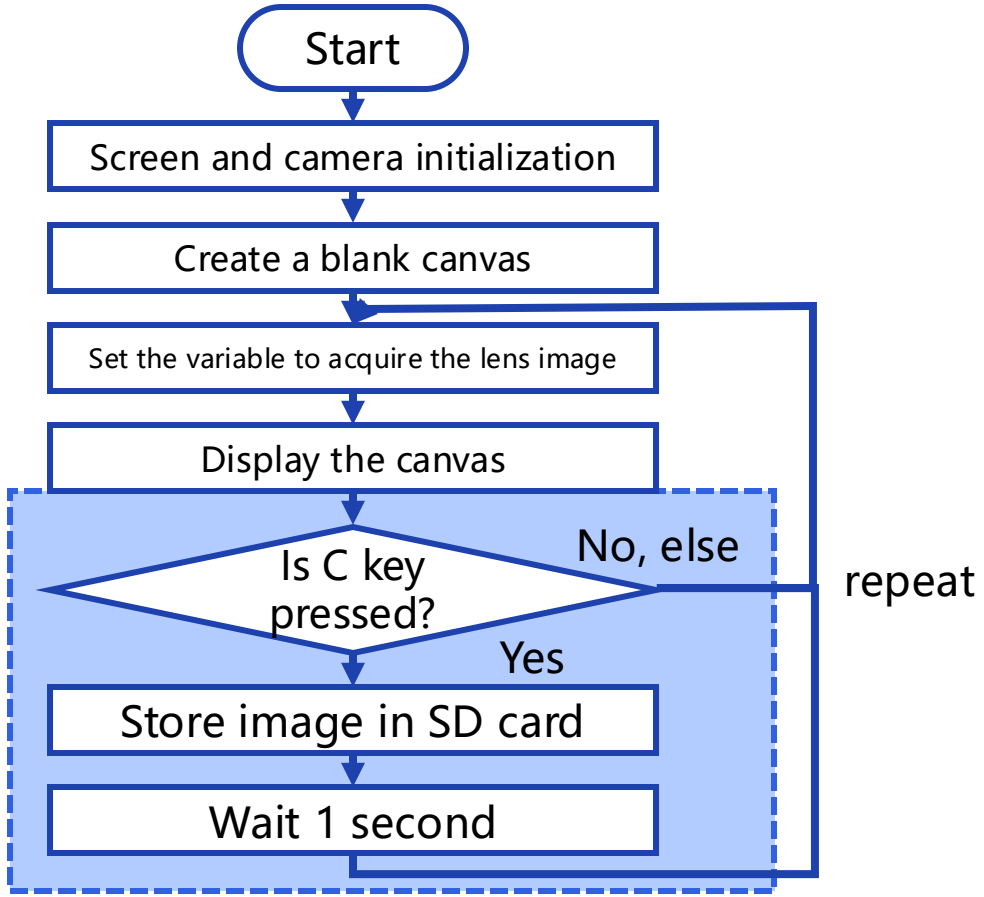
Camera Screen Display

Activity 3: Continuing from Activity 2, press the C button to complete the photo storage function

Camera Screen Display

Activity 3: Continuing from Activity 2, press the C button to complete the photo storage function

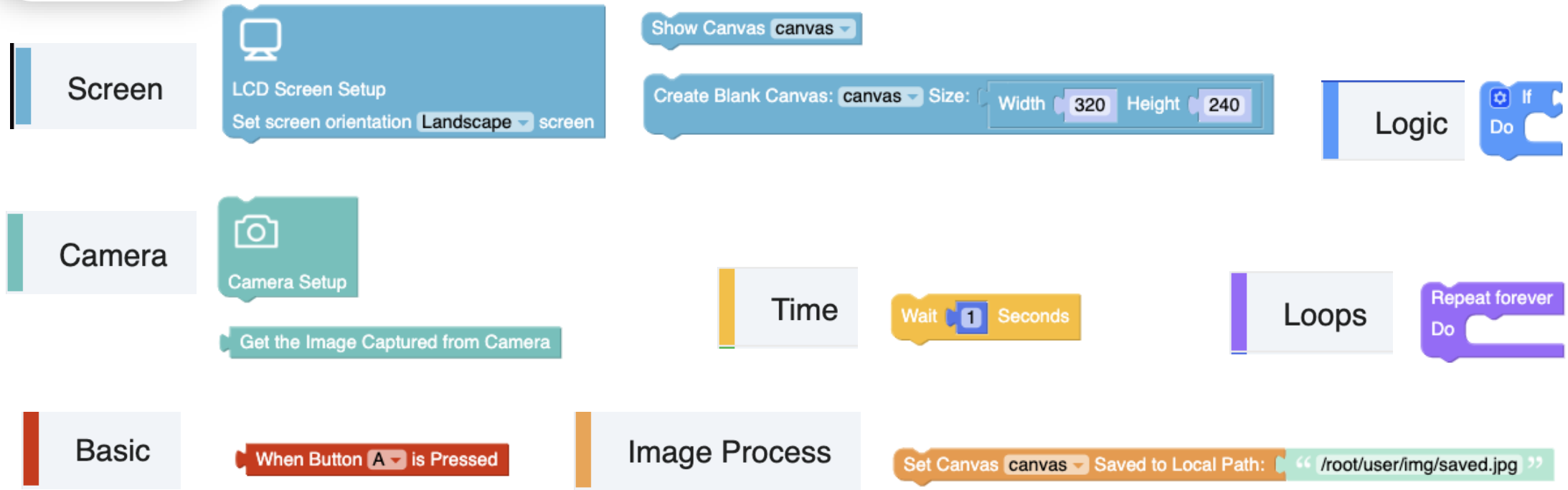
Block Sequence



Camera Screen Display

Activity 3: Continuing from Activity 2, press the C button to complete the photo storage function

Blocks Used



Camera Screen Display

Activity 3: Continuing from Activity 2, press the C button to complete the photo storage function

Block Explanation

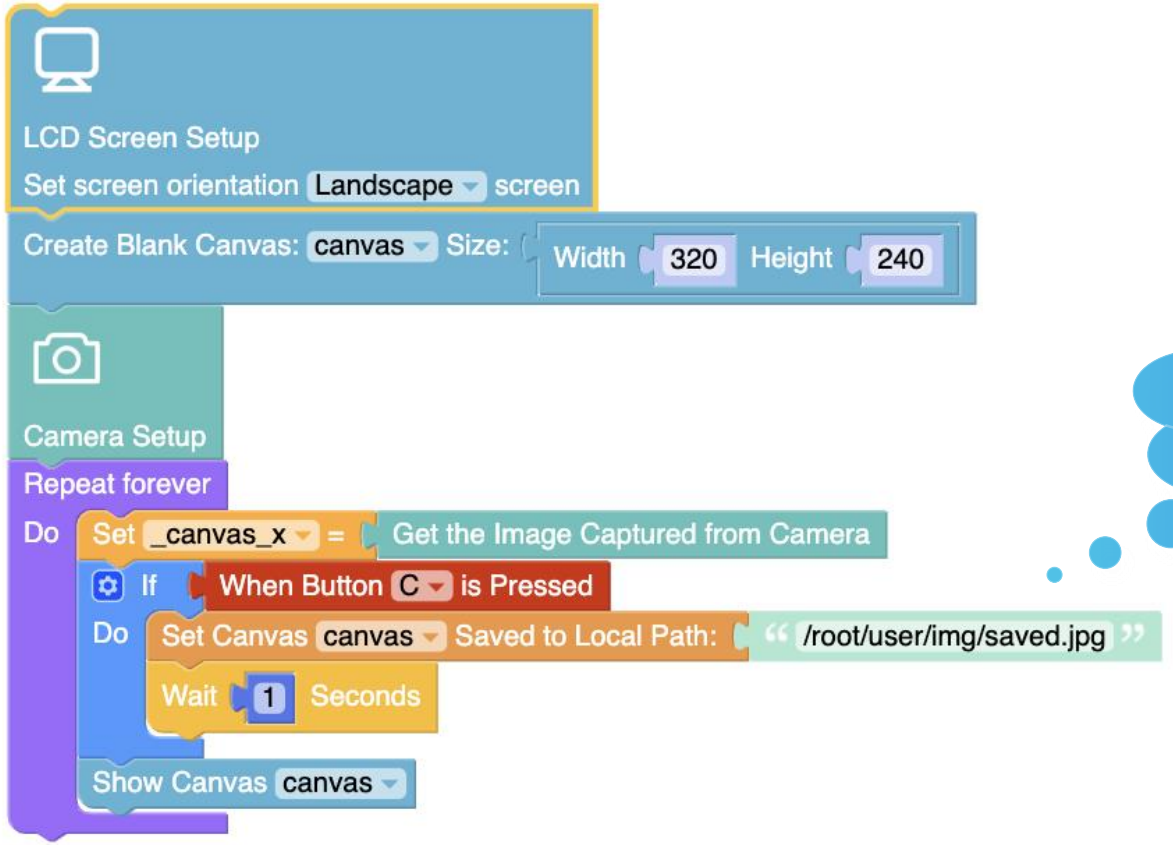
/root/user/img/	saved	.jpg
File path	Image name	Image Format

Note that the pictures are placed under the user folder

Camera Screen Display

Activity 3: Continuing from Activity 2, press the C button to complete the photo storage function

Block Reference



Pay attention when modifying the file path

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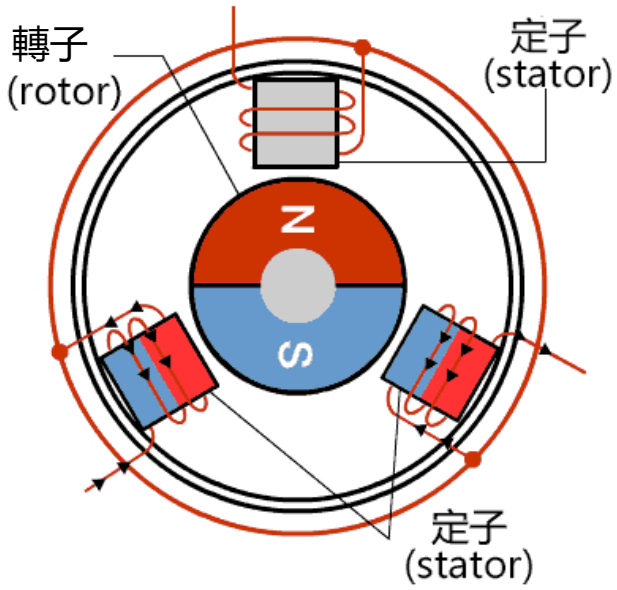
CHAPTER

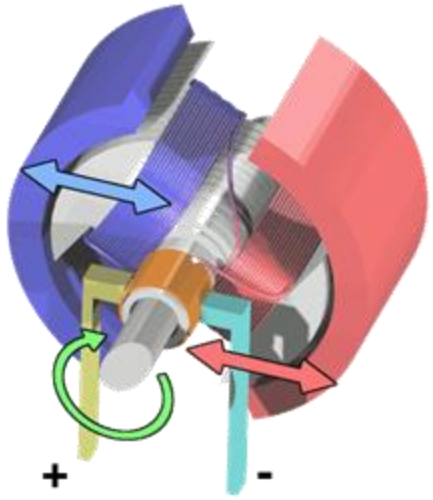
FOUR.

Motor and Servo

CHAPTER

Meet TT Motors



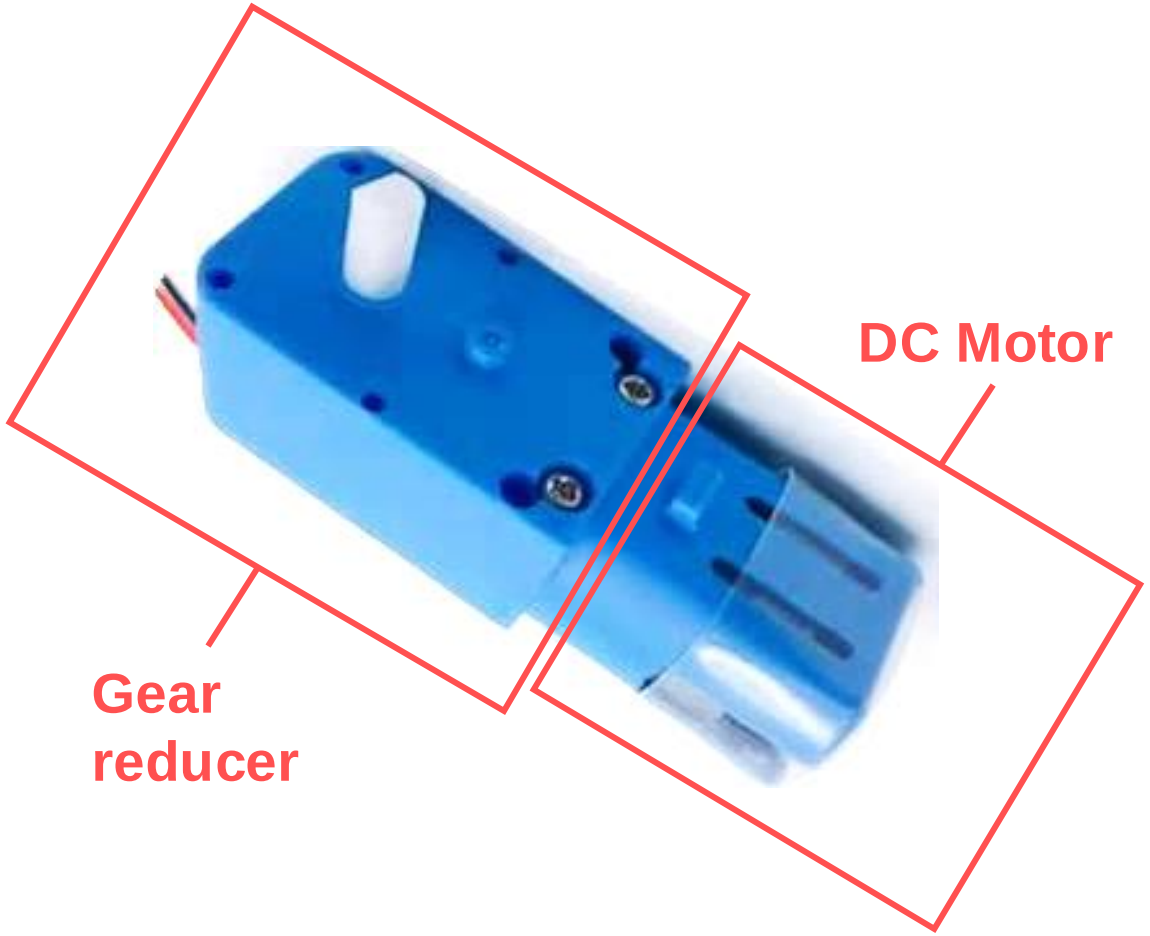


TT motor, also known as electric motor, is an electrical equipment that converts electrical energy into kinetic energy and is used to drive other devices.

Meet TT Motors

DC reducer motor also known as a gear reducer motor, is composed of an ordinary DC motor and a supporting gear reducer.

The function of the gear reducer is to reduce the speed and increase the torque to provide strong power.



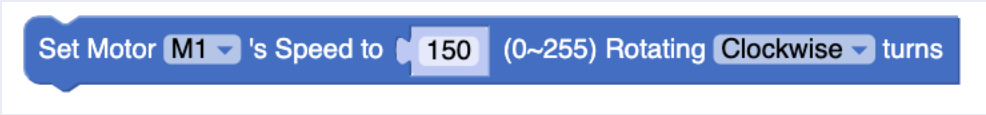
Meet TT Motors

- Rated voltage: 4.5-6V
- No-load speed: 90±10rpm (depending on the reduction ratio)
- Load Current: 190mA (250mA max)
- Maximum torque: 0.8Kg·cm
- Wire length: 15cm
- TT motor is a DC reducer motor and can be used in DIY scenarios with speed and torque requirements, the speed can be adjusted which can recognize forward and reverse rotation with low noise.

Usage of TT Motors

Instruction Description

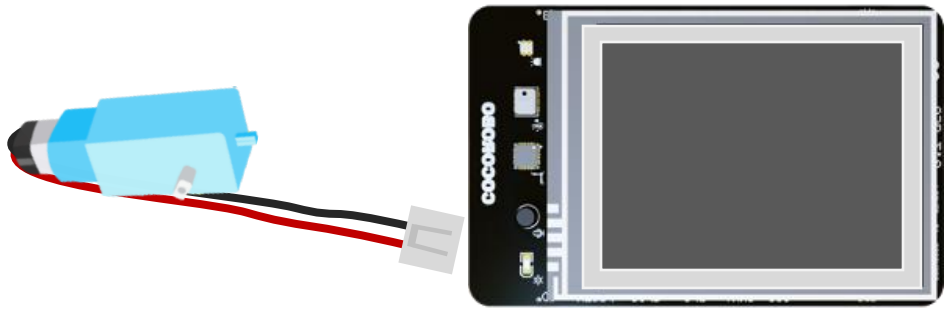
Power

Block Icon	Introduction
	Initializes the TT motor
	Set the specified number for the TT motor to rotate at a certain speed/direction

Power on the Motor

Activity 1: Rotate the TT motor clockwise at a speed of 50。

Connect the module to the TT motor



Use blocks

Power on the Motor

Activity 1: Rotate the TT motor clockwise at a speed of 50。

Block Reference

Servo Motors Introduction

“Servo Motor”

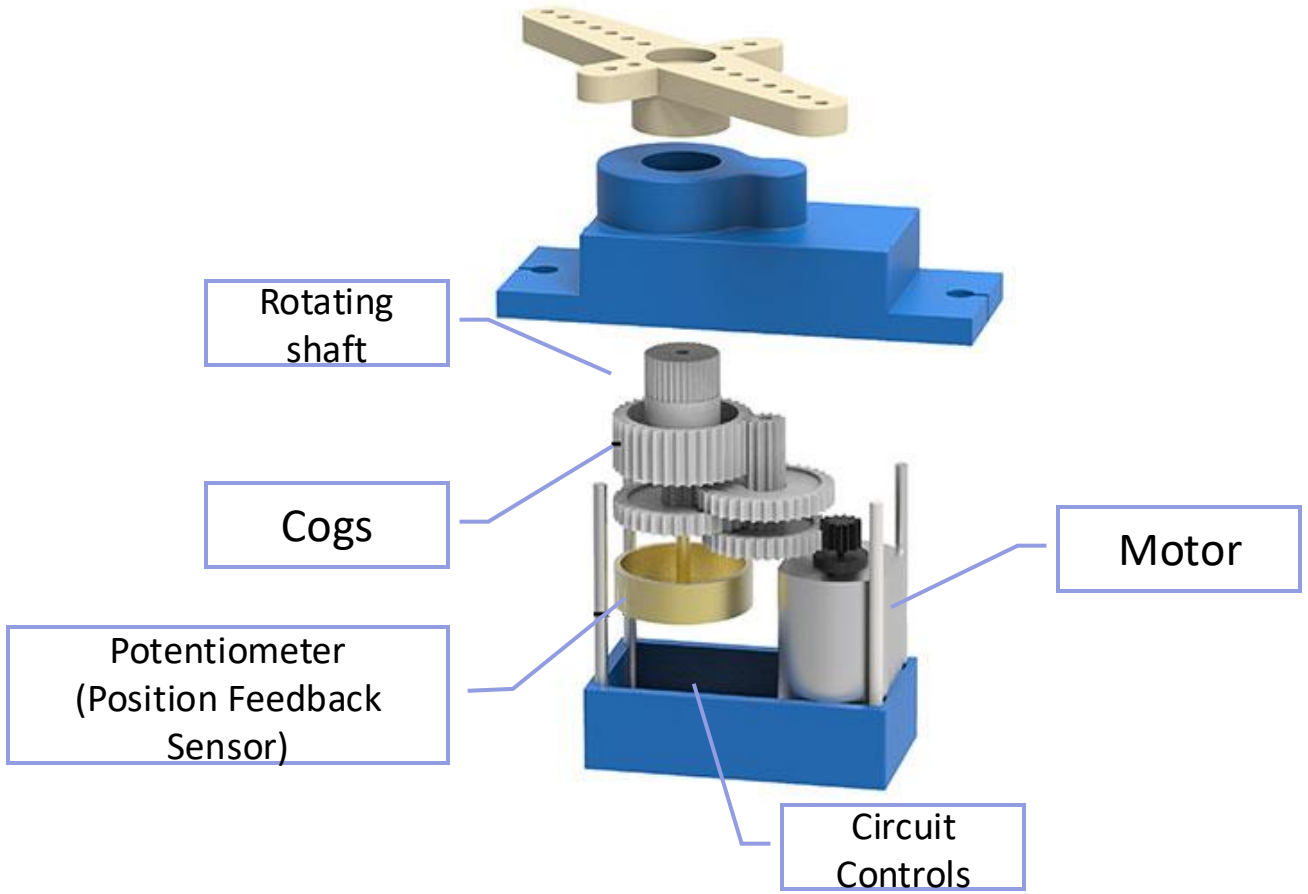
A servo motor is a motor that acts according to commands.

The servo motor can recognize its position and control its action speed.

SG90 Servo Motor

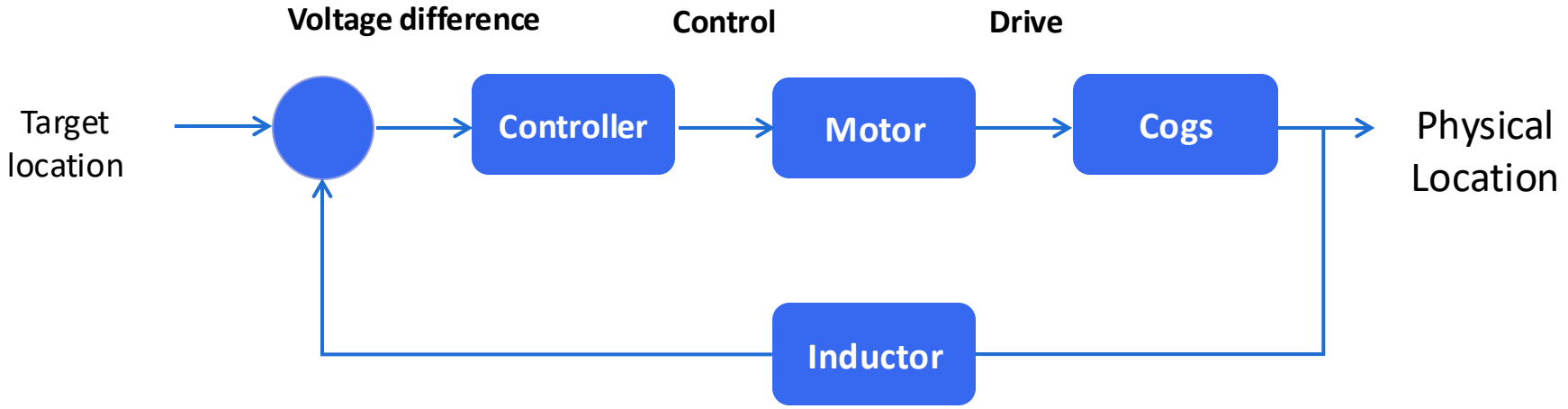
MG90 Servo Motor

Servo Motors Introduction



圖源：https://learn.thestempedia.com/wp-content/uploads/2018/05/Servo-Motor.jpg

Servo Motors Introduction



The position detector (angle sensor) is its input sensor, and the resistance value of the position detector will change the position of the servo motor rotation. By reading the resistance value in the control circuit, the speed and direction of the motor can be adjusted appropriately according to the resistance value, so that the motor rotates at a specified angle. This enables precise rotation control of the servo motor.

Servo Motors Introduction

Combine the servo motor with either servo motor arm.

What is the maximum angle range of the servo motor that is turned by the rudder arm?

Servo Motor Arm

Servo motors and accessories

Servo motor plus arm

Servo Motors Introduction

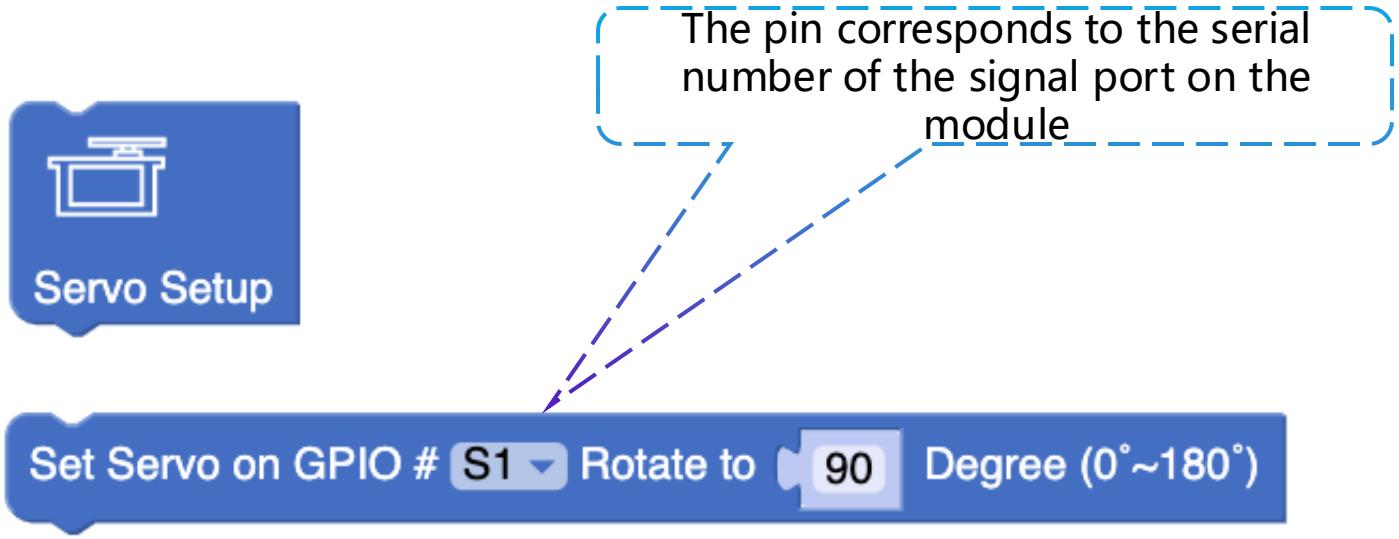
Use a Type C Cable to connect the module to the computer

Servo Motors Introduction

Activity 2: Control the servo motor to rotate between 0 and 90 degrees.

Block Explanation

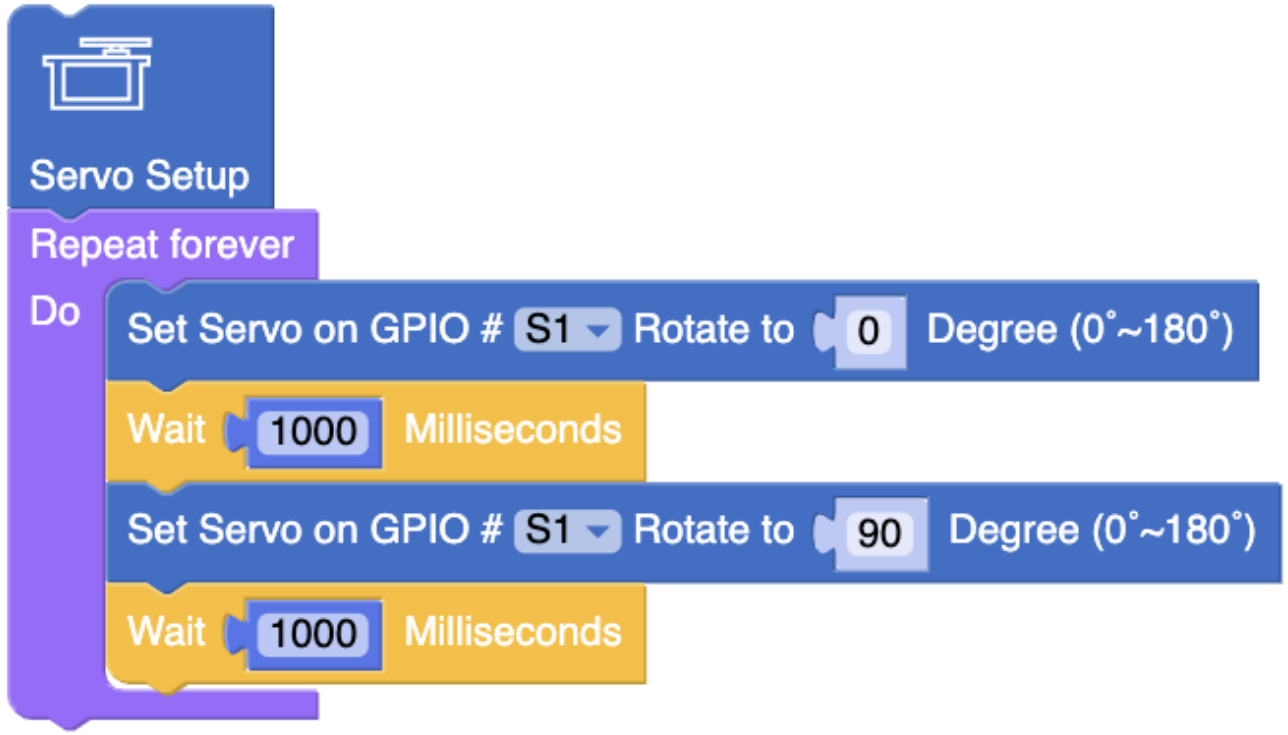
Power



Servo Motors Introduction

Activity 2: Control the servo motor to rotate between 0 and 90 degrees.

Block Reference



See you!

T H A N K S

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