TARKUSTECH INNOVATIONS

intro deck 2019

ABOUT

TARKUS

innovation

DEMANDS IN VIETNAM MARKET

1. The global trends of STEAM & AIOT programming education in ES & MS.

2. In Vietnam, the increasing trends on IT offshore outsourcing from 2005, such as Intel and Oracle: it also indicates more and more demands on programmers.

3. The salary of Coding human resource is higher than others, usually starting from 648 USD/Mon，
   - Salary range on factory workers is around 175 USD/Mon，
   - Salary range on new office employees is 300~500 USD/Mon，
   - Salary range on senior office employees is 600~700 USD/Mon。

Brand starting from STEAM Concept

STEAM fields are science, technology, engineering, art and mathematics,
Support broadening the study of engineering within each of the other subjects,
and beginning engineering at younger grades, even elementary school.

Tarkus means from wisdom in Estonian. Estonia, the first world country
to promote STEAM education into their ES & MS School system Sep. 2012,
In the next year, they implemented STEAM and coding
programs and curricula to a part of compulsory education.

The establishment of Tarkus is also a meaning of our anticipation
to cultivate the teaching scope of Estonia.
It will be a major shift to a new standards of education.

The more detail about curriculum on official website:
https://tarkustech.com/en_us/

Partners

Academic institutes

National Chiao Tung University
- Center for Academia and Industry Collaboration

National Tsing Hua (Nanda Campus)
- Department of Education and Learning Technology

National Taiwan University of Science and Technology
- Department of Design

St. John’ s University
- Department of Industrial Engineering and Management

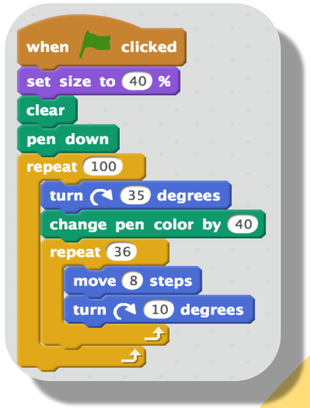
TW Channel and Associations

- MakerPro & Project Plus
- Association of Chinese-straits Culture & Education Chain
- Dr. kids Creativity Education Ltd.

HK Channel and Associations

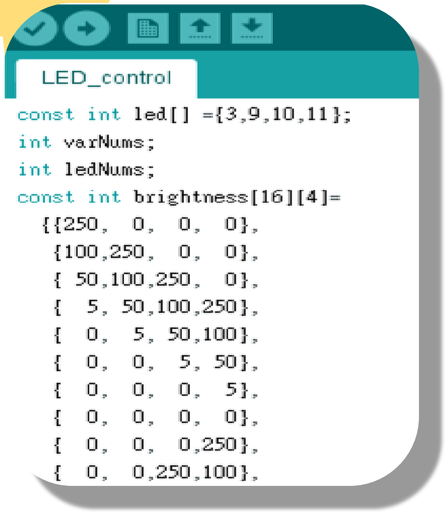
- Pi innovation
- HKEDA
- HKIEACA

Problem in ES & MS Educational Market



Blockly VP

Programming

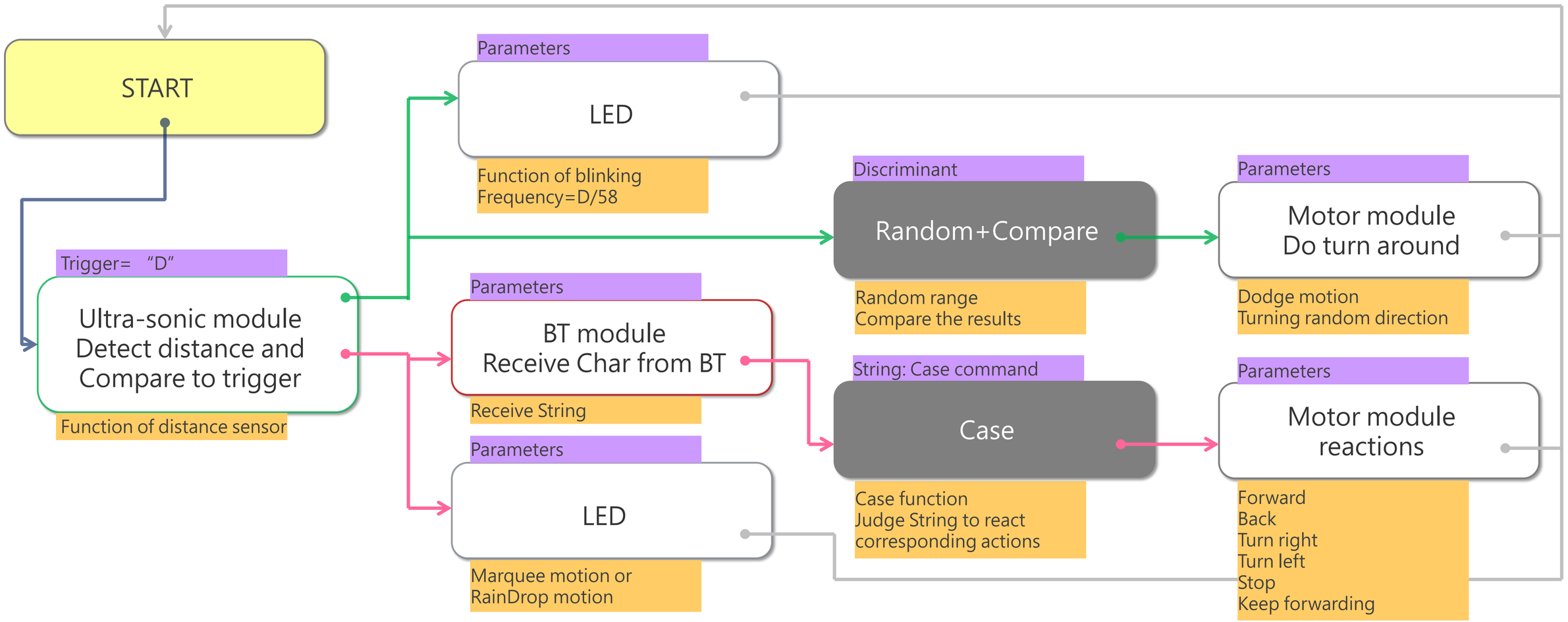


A learning gap between step of Blockly & Programming:
While students need more…

- to learn complex commands & syntax logic
- to understand advanced concept of function applications

TARKUS innovation

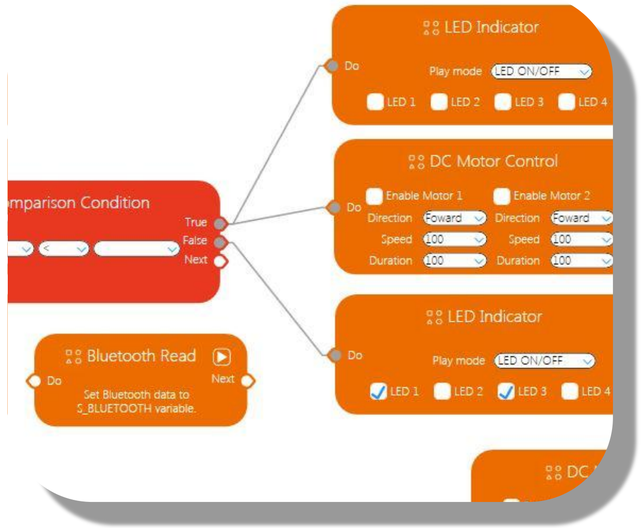
Flow Logic: intuitive



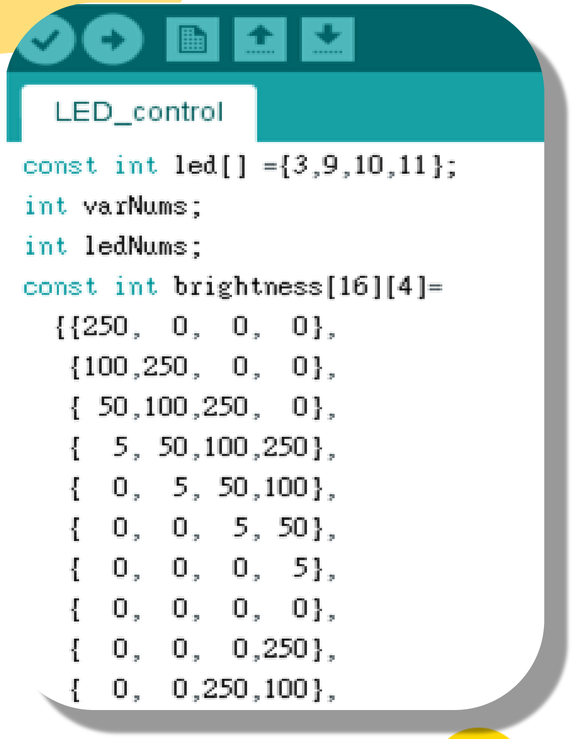
The code-learning map position of Flow Chart

Blockly VP

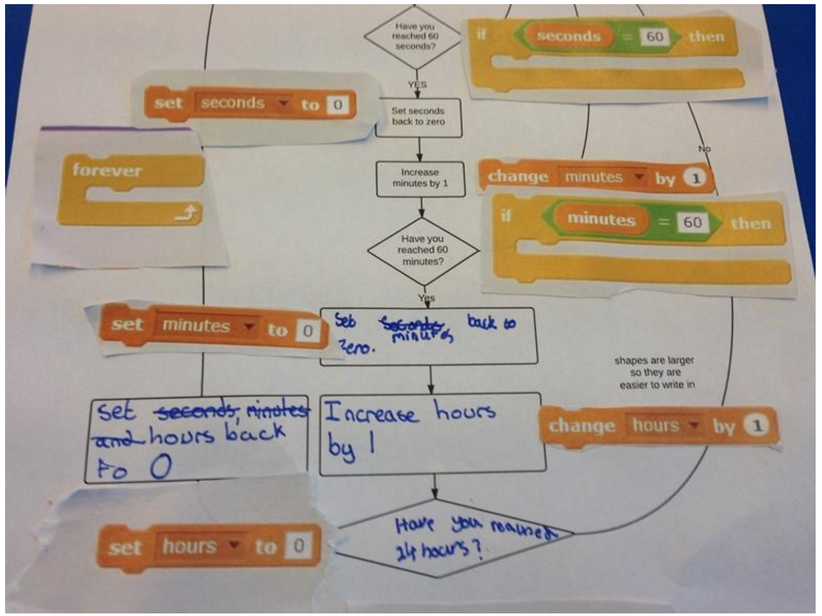
Flow & Logic



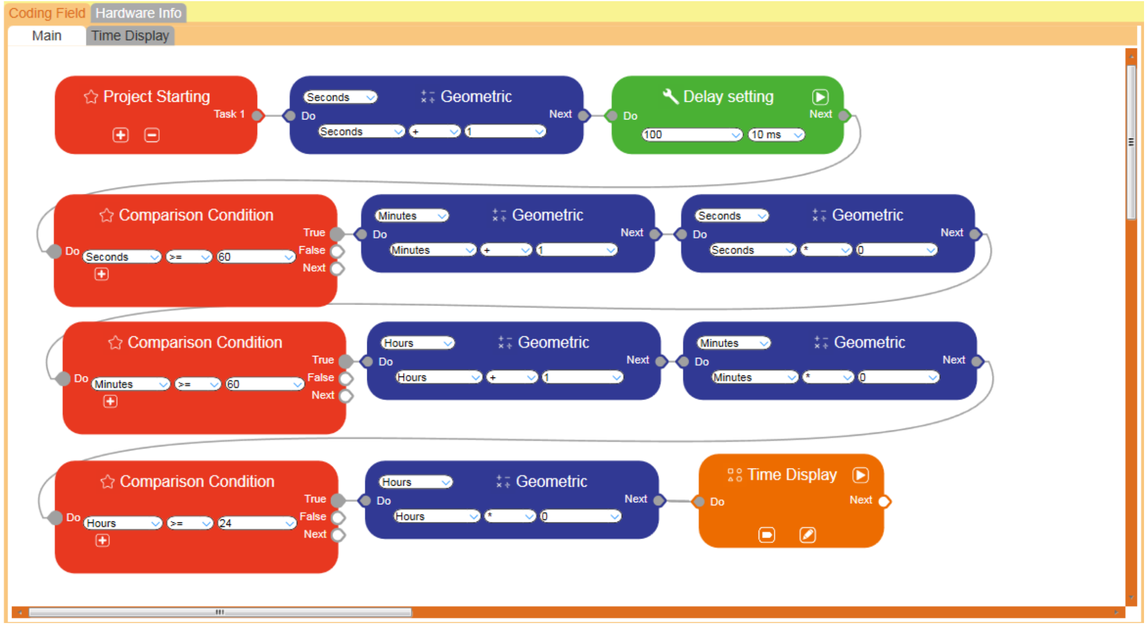
Programming



Comparison of Blockly & Flow interface



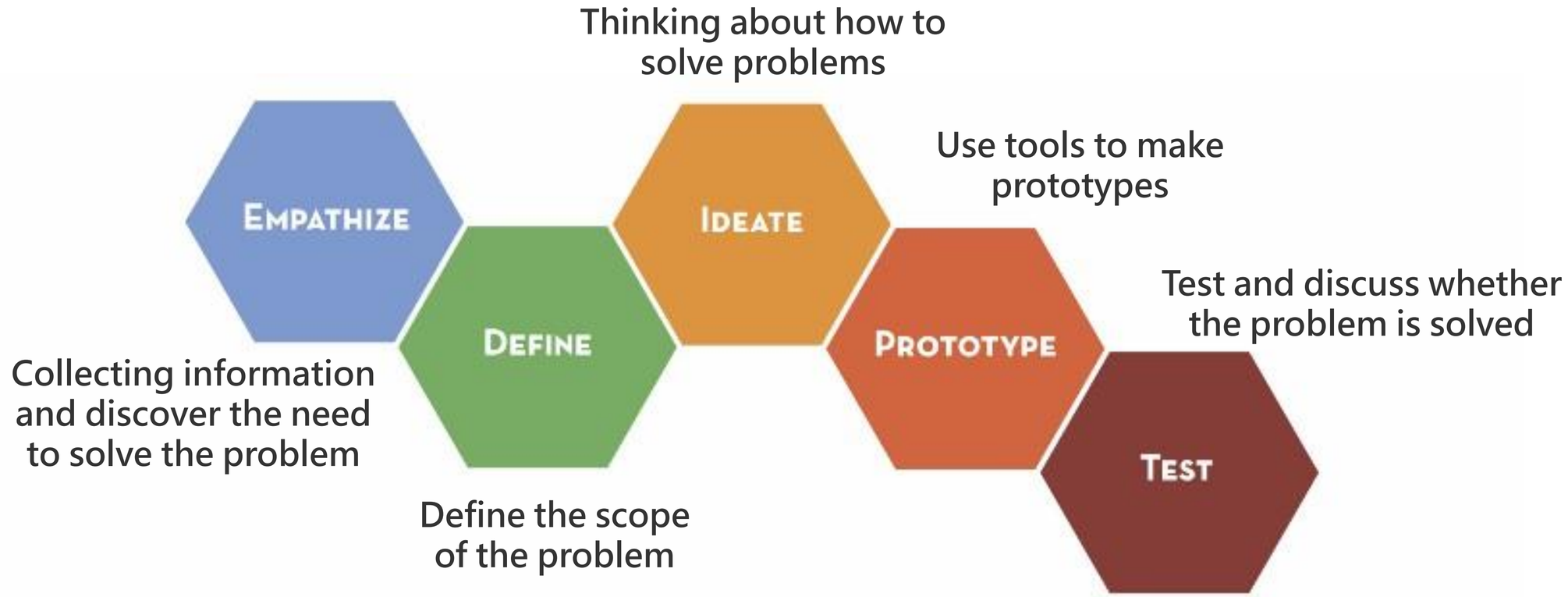
http://code-it.co.uk/scratch/clock/clockoverview



Coding education stage comparison

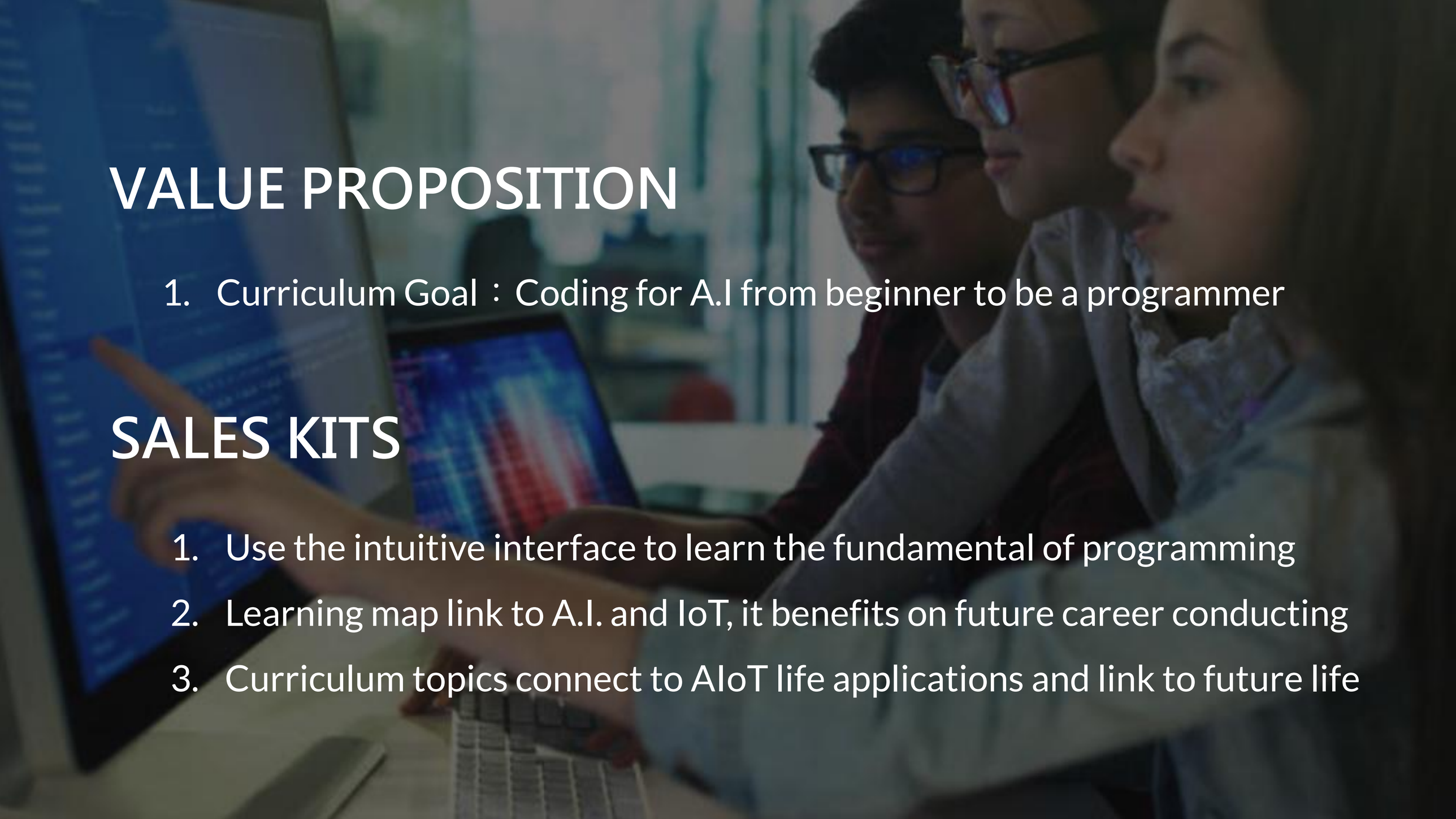
Type	Blockly VP	Flow-Based VP (FBP)	Coding Directly
Difficulty	Starter	Middle	Advanced
Education Tool	microBit mBot All Scratch based	TarkusVP (TW) SAMLab (US) Neuron (CN) LegoEV3	Arduino Python
Strength	Learning the basic coding structure according to the original coding	Learning the coding logic concepts according to the methodology of flow	Learning the code directly that usually applied in HS stage
Weakness	Teachers must have a programming background More complicated Project cannot be used	**SAM Lab & Neuron:** Have different methodologies to describe the problem solving **Lego EV3:** too many icons and graphic to understand the logic	Need the fundamental basis of the coding. Teachers

Design Thinking Process



Category	Stage	Tool	Focus on	Application
Algorism	IDEATE	Flow Chart	Problem solving, Logic	Strategy, communication, management
Coding tool	PROTOTYPE	Coding	Use and proficiency of tools	Engineering, realization

TARKUS innovation



VALUE PROPOSITION

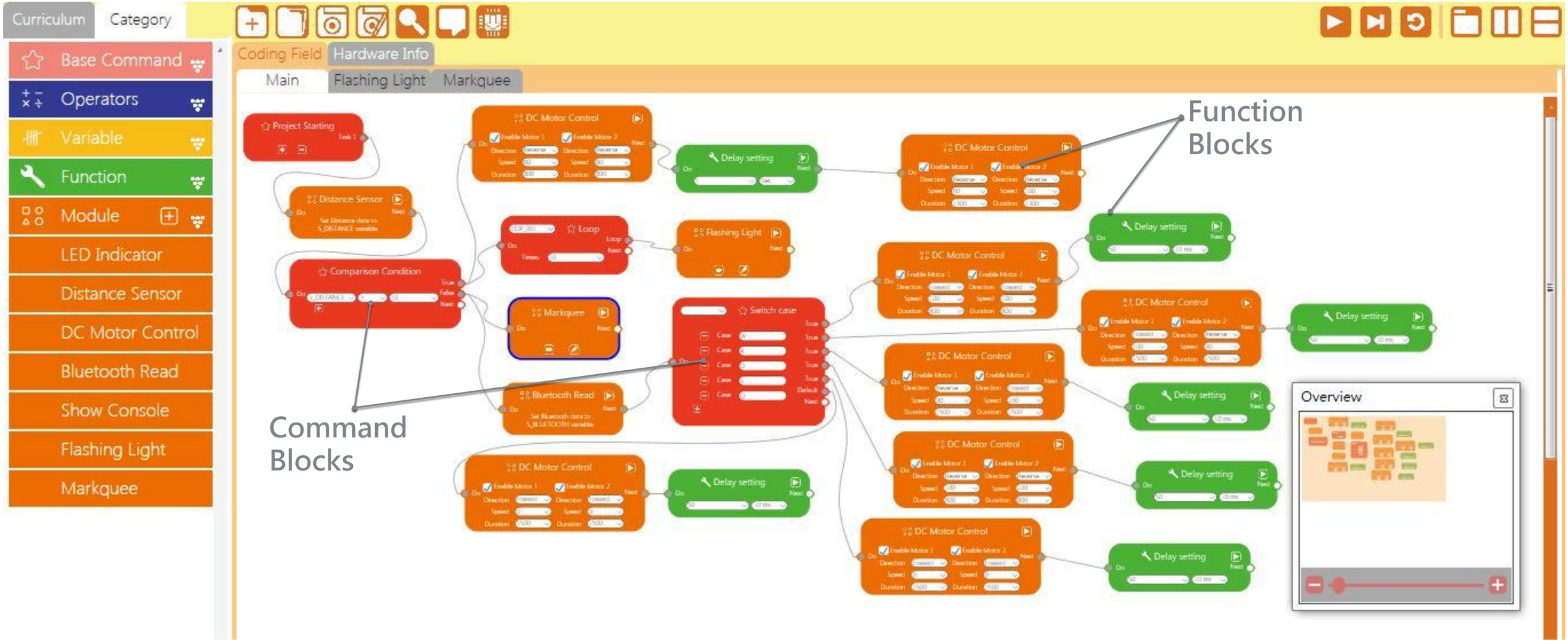
1. Curriculum Goal：Coding for A.I from beginner to be a programmer

SALES KITS

1. Use the intuitive interface to learn the fundamental of programming
2. Learning map link to A.I. and IoT, it benefits on future career conducting
3. Curriculum topics connect to AIoT life applications and link to future life

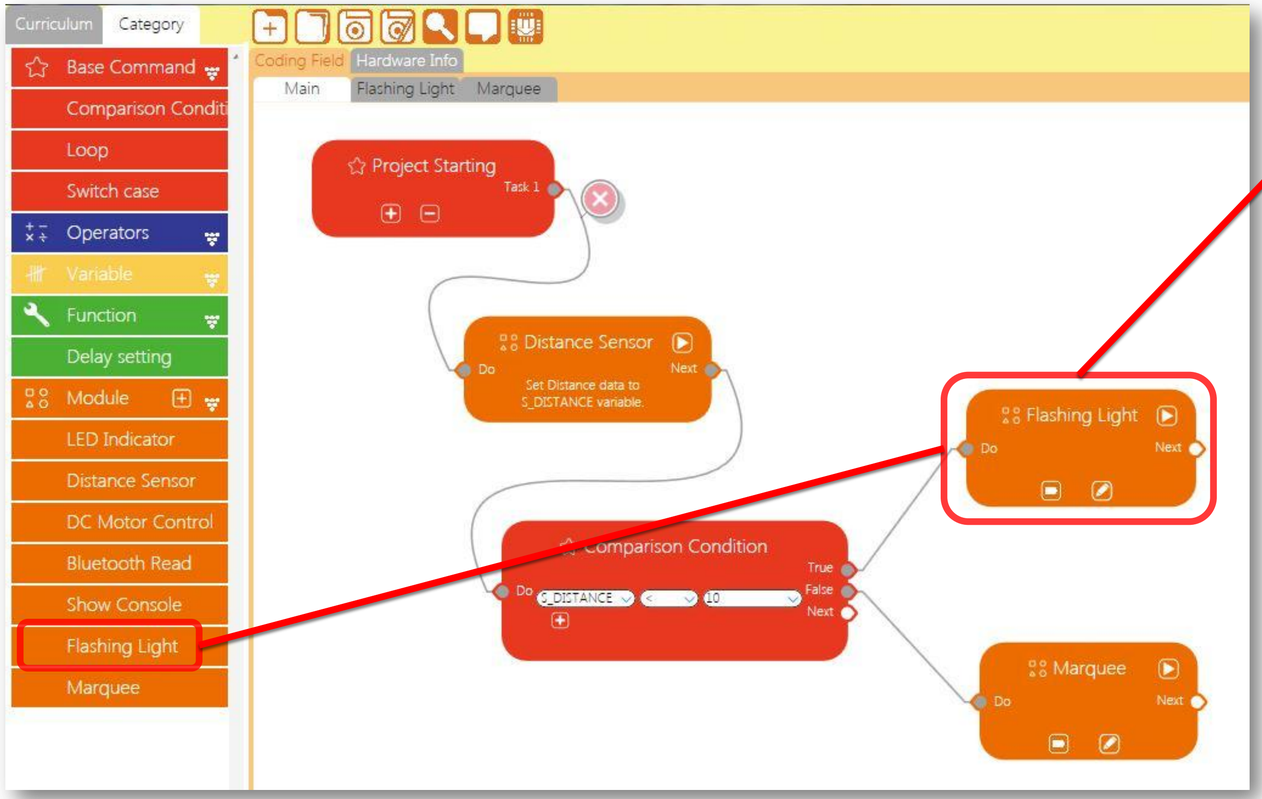
Realize the FBP concept on TarkusVP software

Use Flow Chart to Start Coding

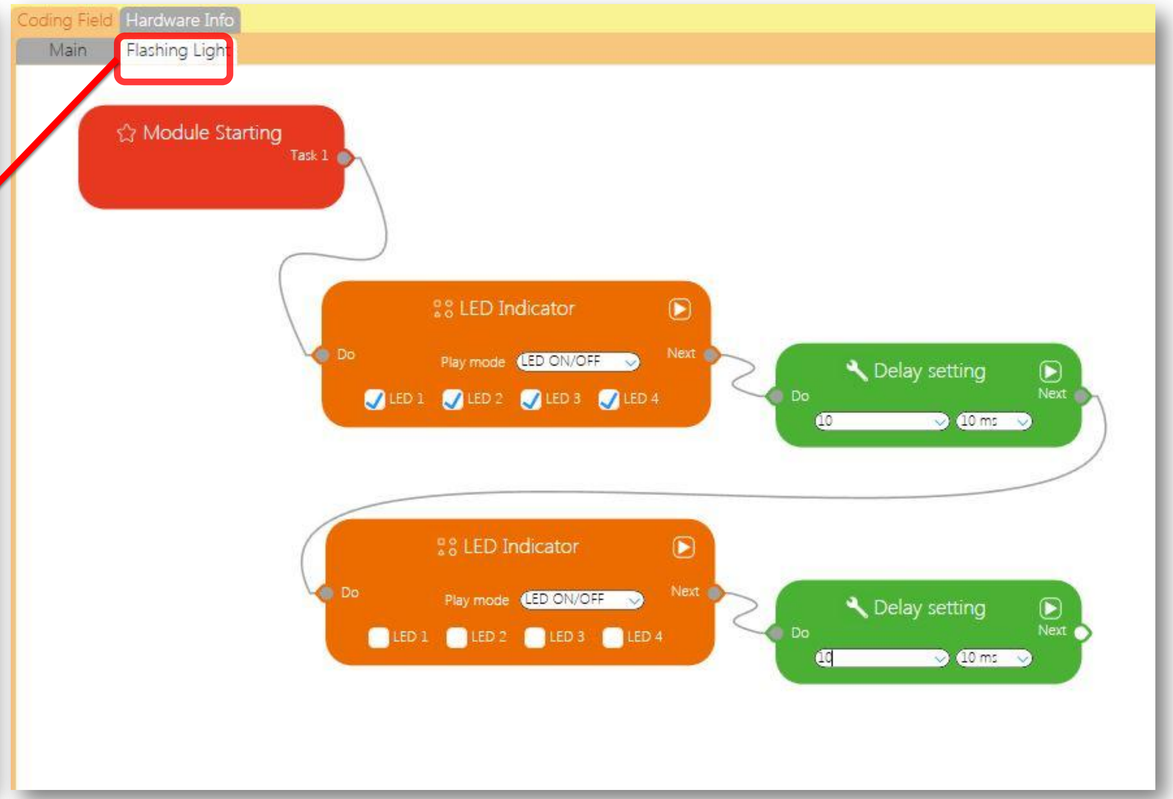


Realize the FBP concept on TarkusVP software

Make your own block within Library Concept



Main Page

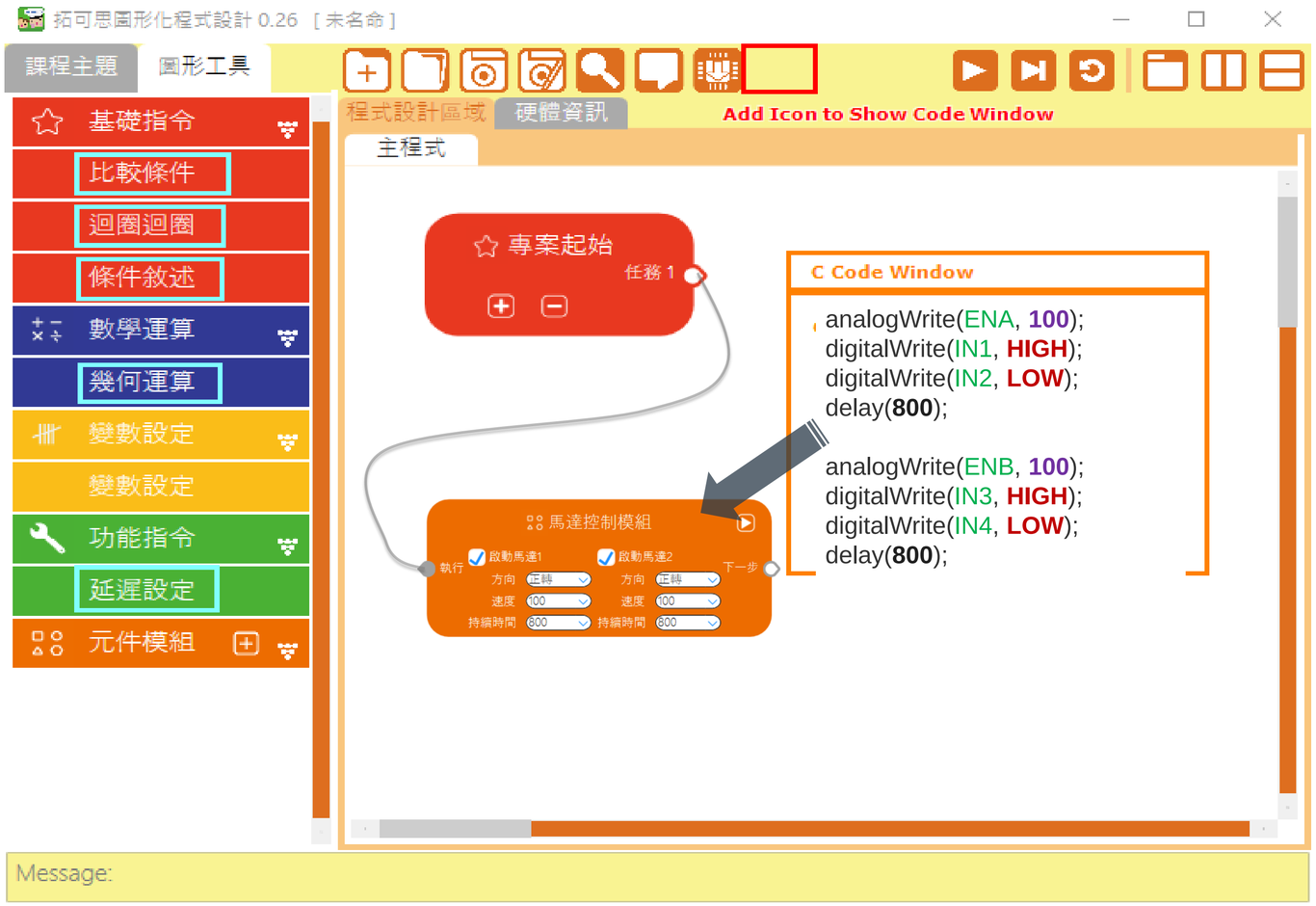


Costumed Block Page

Realize the FBP concept on TarkusVP software

Show the code window for advanced learning

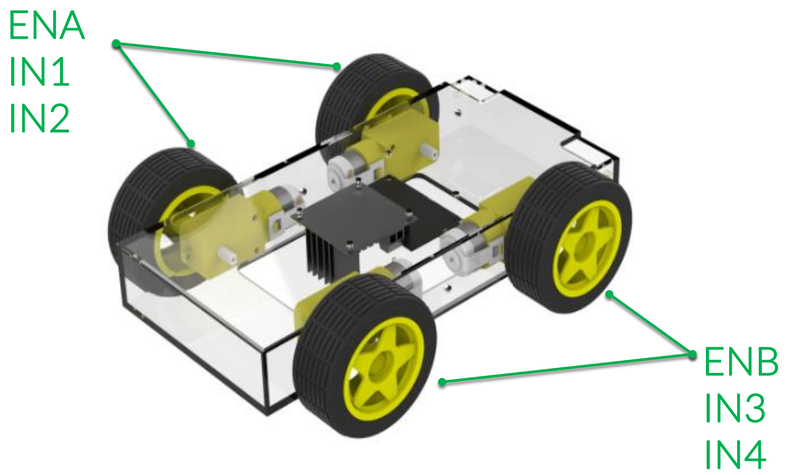
- After the logic learning, we could connect to advanced coding course, such as Arduino or C language.



Example for use of Hardware Info

When the box is selected, it will show the status of ENA and ENB

- The settings of direction show as **red word**
- The speed value will show as **purple word**
- The value of time duration will show as **orange word**



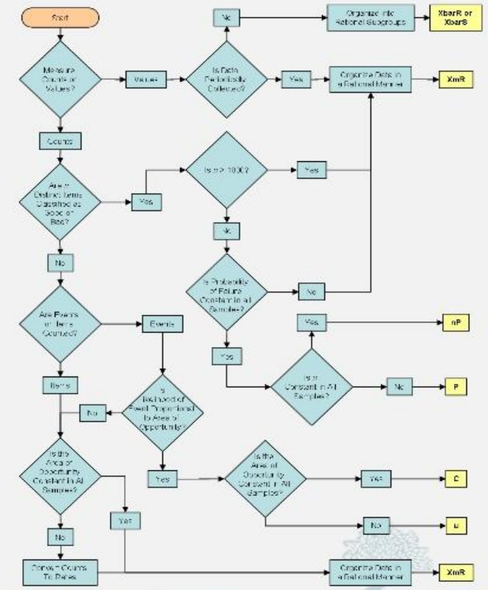

TarkusVP
Connect to future

Control Flow in Software design

Interface Design

Introduction to Software Design

- Describes how the software elements communicate with each other, with other systems and with human users
- Much of the necessary information required is provided by the data flow and control flow diagrams

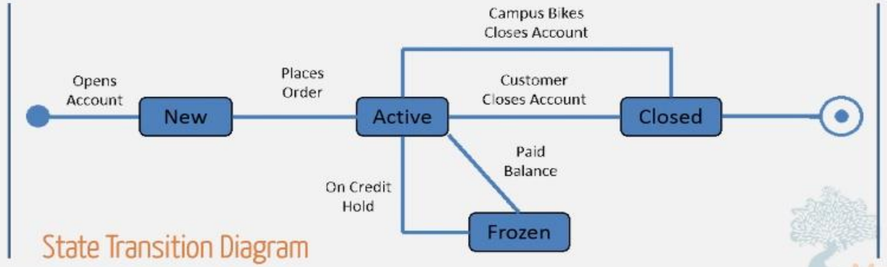


Control Flow Diagram

Procedural/Component-level Design

Introduction to Software Design

- Created by transforming the structural elements defined by the software architecture into procedural descriptions of software components
- Uses information obtained from :
  - Process specification (PSPEC)
    - Use cases, FlowCharts, Activity Diagrams…
  - Control specification (CSPEC)
    - State Transition Diagram (STD), Decision tables …

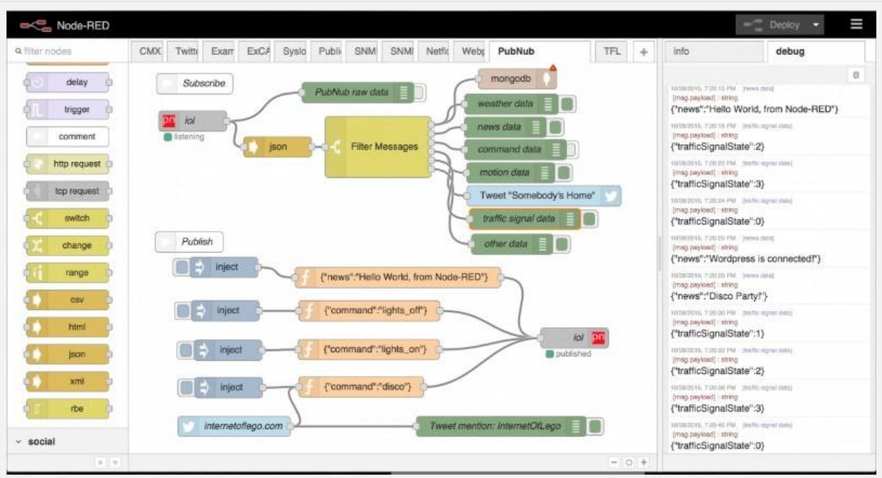


State Transition Diagram

MedTech Chapter 3 – Software Design Specificities of the design step, UML modeling Dr. Lilia SFAXI
www.liliasfaxi.wix.com/liliasfaxi Slide 1 MedTech – Mediterranean Institute of Technology Software Engineering
MedTech . Published on Feb 7, 2017

Use the Control flow to describe the IOT

Flow chart concept is very common in professional software projects.
E.g:

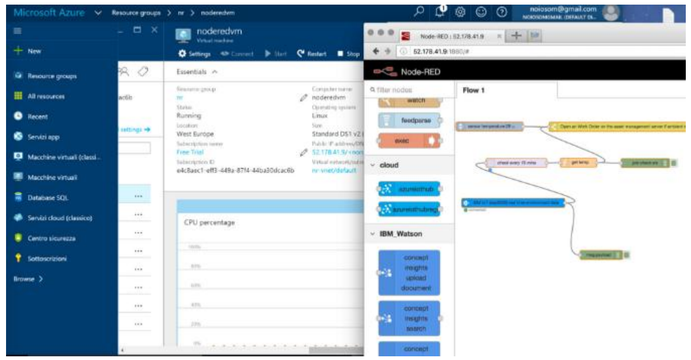


適合IOT應用的視覺化開發工具Node-RED

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

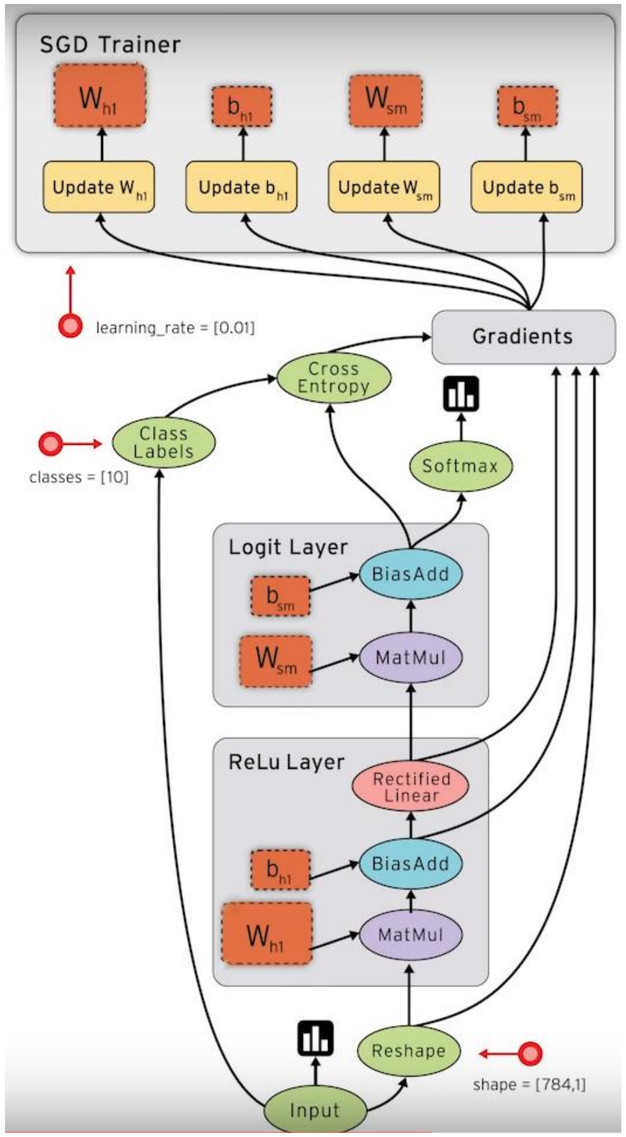
IBM BlueMIx

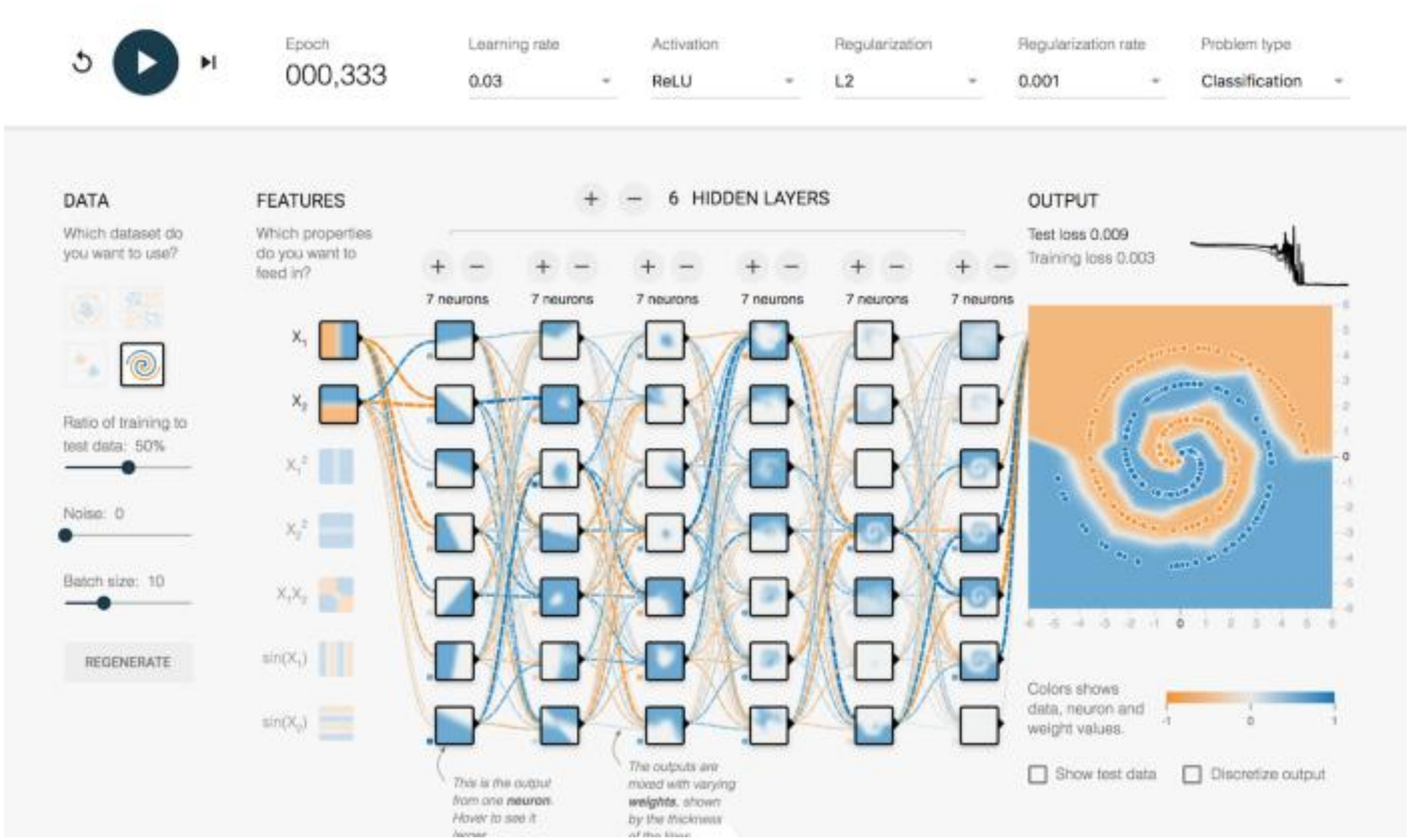
Advantech
WISE-PaaS 2.0



Microsoft
Azure

Dataflow/pipeline to describe the neuron network





- [Google Cloud Targets Machine Learning Developers]
- [Why First Hidden Layer Is Very Important In Building a Neural Network Model And Relation Between Vanishing Gradient And First Hidden Layer]

TarkusVP

Physical Product:
Teaching aids

TarkusVP Users and Scenario

- Target Audience from K4 ~K9 (ES/MS school)

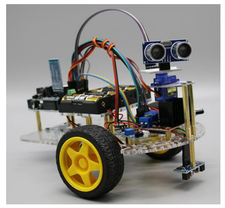
Teachers @ Offline Tutor institute/Schools

- ✓ ES/MS curriculum : **BeeCar or MelaCake EDU version (Acrylic)**
- ✓ Summer Camp : **MelaCake EDU version (Acrylic)**
- ✓ Robotic Competitions : **MelaCake EDU version (Acrylic) with Arduino**
- ✓ Coding experience activities : **MelaCake EDU version (Acrylic)**

Online Students / Personal User

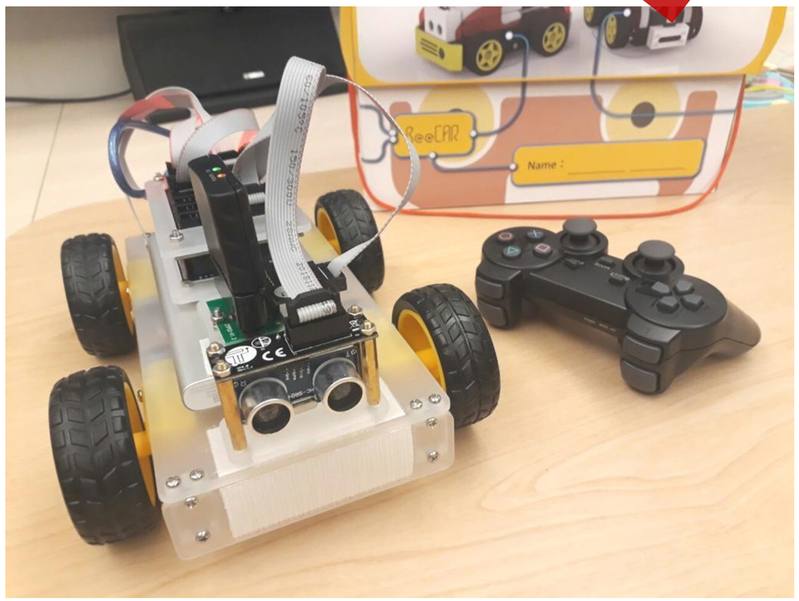
- ✓ Coding starter : **MelaCake EDU version (Acrylic)**
- ✓ Games at Home with Coding concept : **MelaCake EDU version (Acrylic)**
- ✓ Costumed UI for robotic or IOT device & equipment operators
- ✓ Makers & Model re-design: **MelaCake EDU version (Acrylic)**

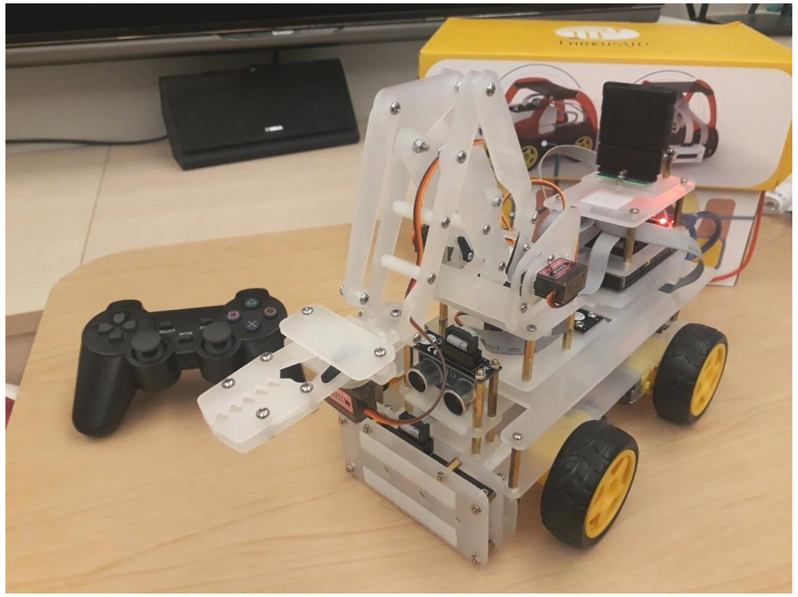
Competitors Benchmark

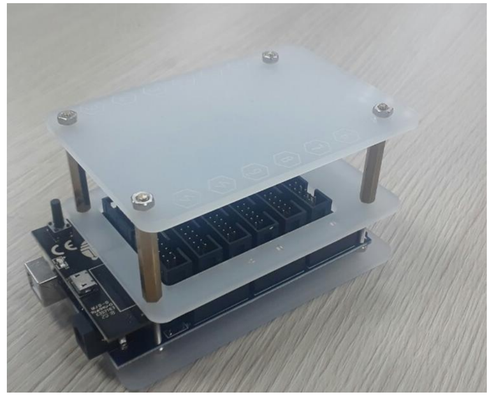
	Electrical Component				Block & Module		
Brand	ZYDUINO	LOBOT	mBOT	Tarkus	Lego	Fishertechnik	Lego
Model	ZYDUINO Kits	QBOT	mBOT	BeeCar 01	Boost 17101	Robo TX Explorer	Mindstorms
							
Price	Low						High
Course	CD	On Website	On-line Reference Book	On-line course and Book	Instructions and learning from Web	Website	Instructions and learning from Web
SW	Arduino IDE	Revise from Scratch 2 CN version	mBOT based on Scratch2 UI	Tarkus VP	Boost App	Robo Pro	Mindstorms EV3
STR	• Lowest Price • Open Source HW Arduino IDE Compatible SW	• Lower Price • Open Source HW Arduino IDE Compatible SW	• Small and light • Safety connect • Arduino Compatible HW	• Simple Modules • Safety Connect • Expendable • FBP learnning	• TA 7~9 • Blocks design can assembly 5 different works	• Blocks design • Professional SW • Flow Chart	• TA 10+ • Blocks design can assembly 8 different works
WEK	• Code UI • Simple • Less HW design	• Modules all-in-one design • Less variability	• Blockly Visual Programming	• Less mechanical concept	• Too simple for 7~9 year-old	• Many Complex parameters setting	• Too many elements to use as a course

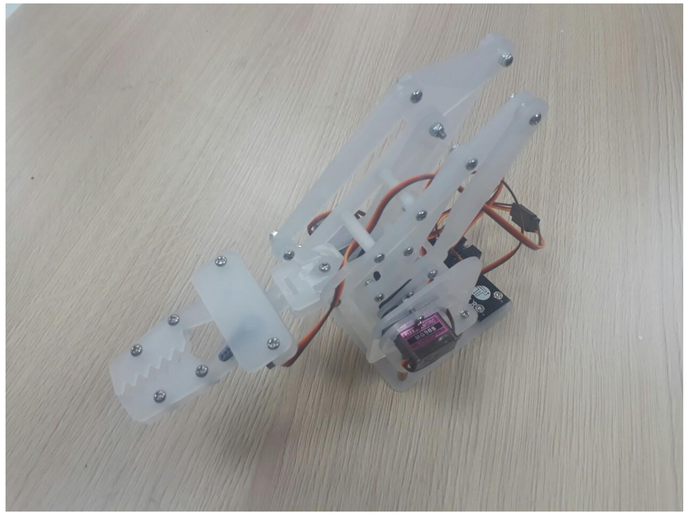
Online course & activity: MelaCake EDU version

MelaCake / MelaCAR (DIY Kits)





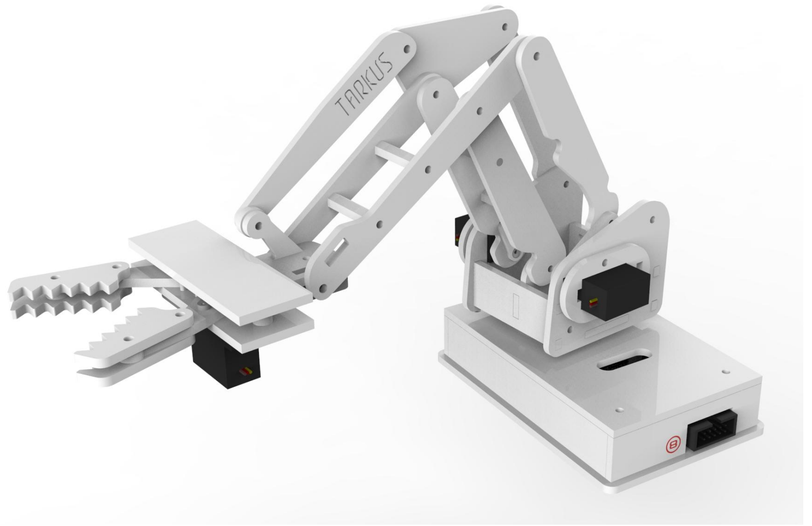




Offline education institute: BeeCar

BeeCar Basic Modules (Assembly already)

BeeCar Extension Modules (Assembly)



Product Summary

- Competitive strength

Intuitive Interface to understand logics

Simple and Easy tutoring solution

Verified Command on Cloud Server

Expansibility Modules

COMPETITIVE ADVANTAGES

1. Integrations of software and hardware will raise the entry barrier.
2. Encryption mechanism on server and hardware benefits to members control.
3. Generate from the birthplace of IT talent – Taiwan, with the full R&D energy and curriculum cowork with top academic institutes: NCTU, NTHU, NTUST.

Curriculum Introduction

TARKUS Curriculum

Motors: BeeCar

Basic Features

- LED motions operation
- Distance sensor application
- BT control
- 2WD Motor control

Sound: Piano

Basic Features

- Change of sound operation
- Click frequency control
- Multi : Drum/Bass
- Connect to DAW App features

Lights: Magic Box

Basic Features

- Mix color operations
- Candle light simulation
- Color sensor applications
- Timer and clock simulation

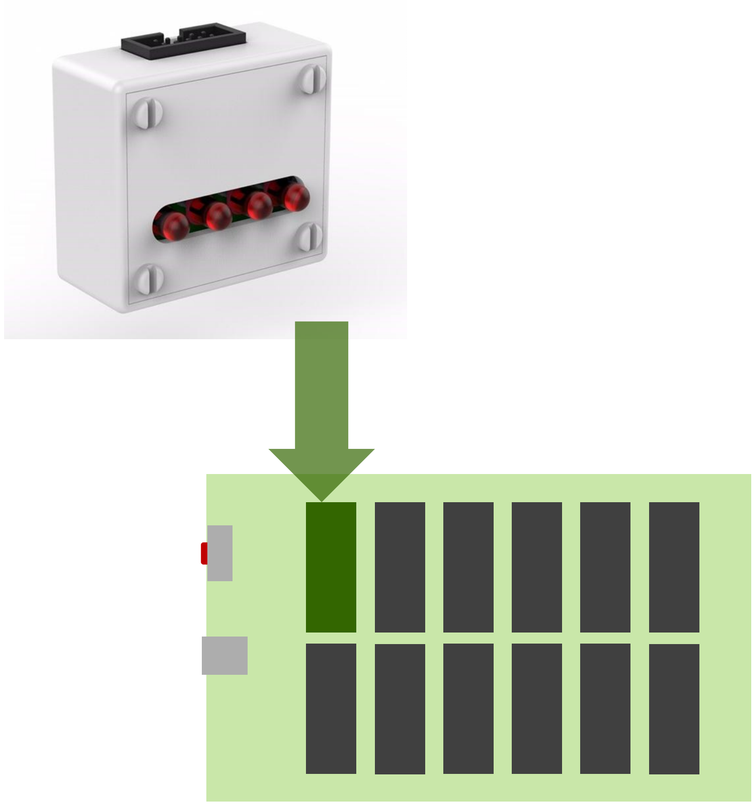
Sensors: Little Farm

Basic Features

- Farming operations
- Plant growing light
- Sensor monitoring interface:
  - ✓ Air humidity/PH value /Day light
- Environment condition triggers

Example: Technology & Engineering

- HW module



- SW Concept

LED Indicator module

Function: 4 LED will chang in various playing mode as below

1. On/Off：Turn On/Off LED1~ LED4
2. Dimmer：Turn on LED with brightness 0~100 settings
3. Slide to Slide：LED with raindrop mode left-and-right-forward

Next：Usually connect to delay command to set a period of time

Loop

Function：Set the times of repetitive actions

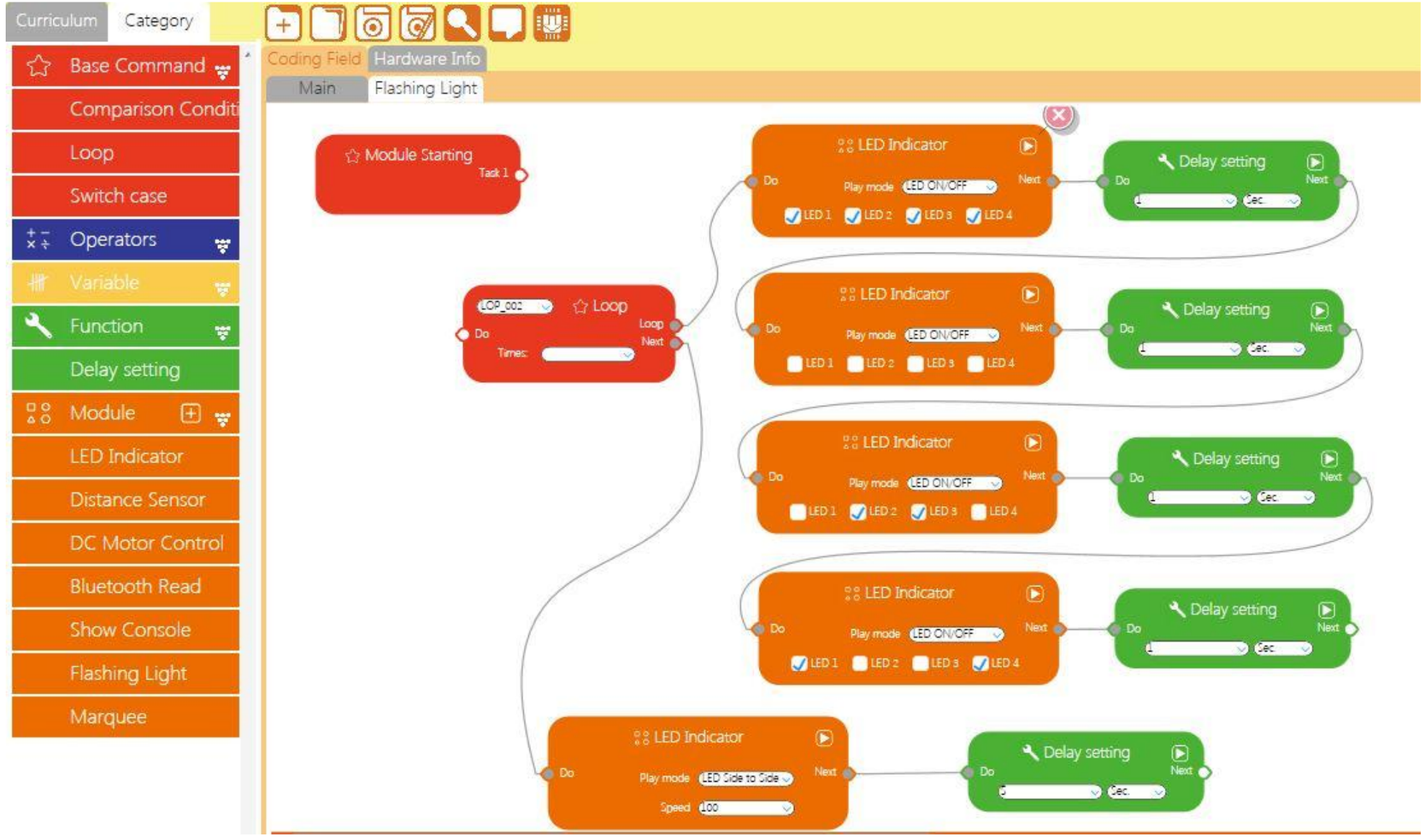
Hints：All the loop will have a specific variable

Next：Actions after repeat times of Loop running out

Example: Design phase

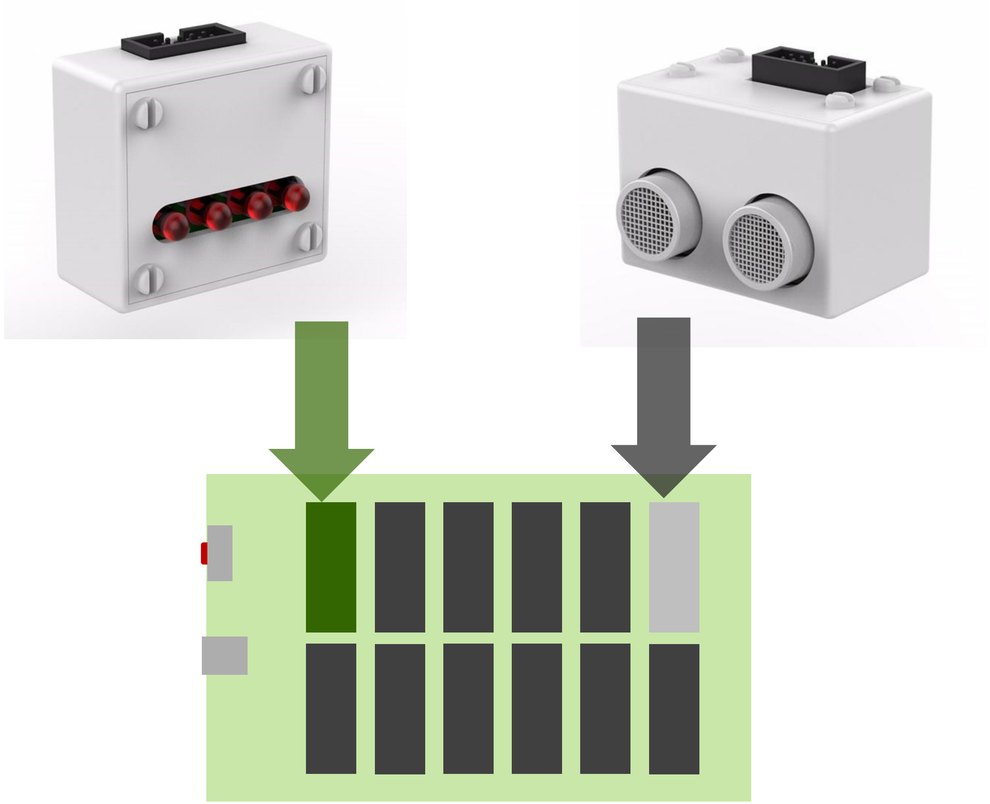
- Experimental design

  4 LED will change as different light motions by your own sequent parameter settings. Use Loop command as well.



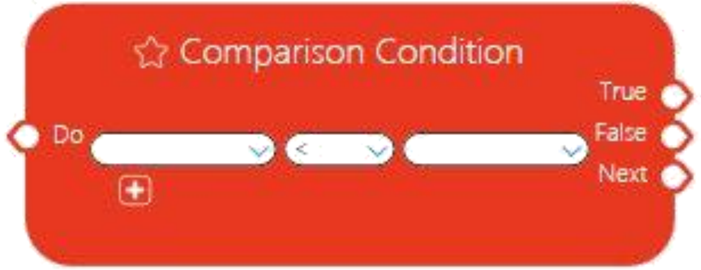
Example: Technology & Engineering

- HW module



- SW Concept

Ultrasonic Distance Sensor
Function：Detect the distance value and storage in S_DISTANCE
Hints：use cm as distance unit here
Next：Usually connect to Compare command as a triger

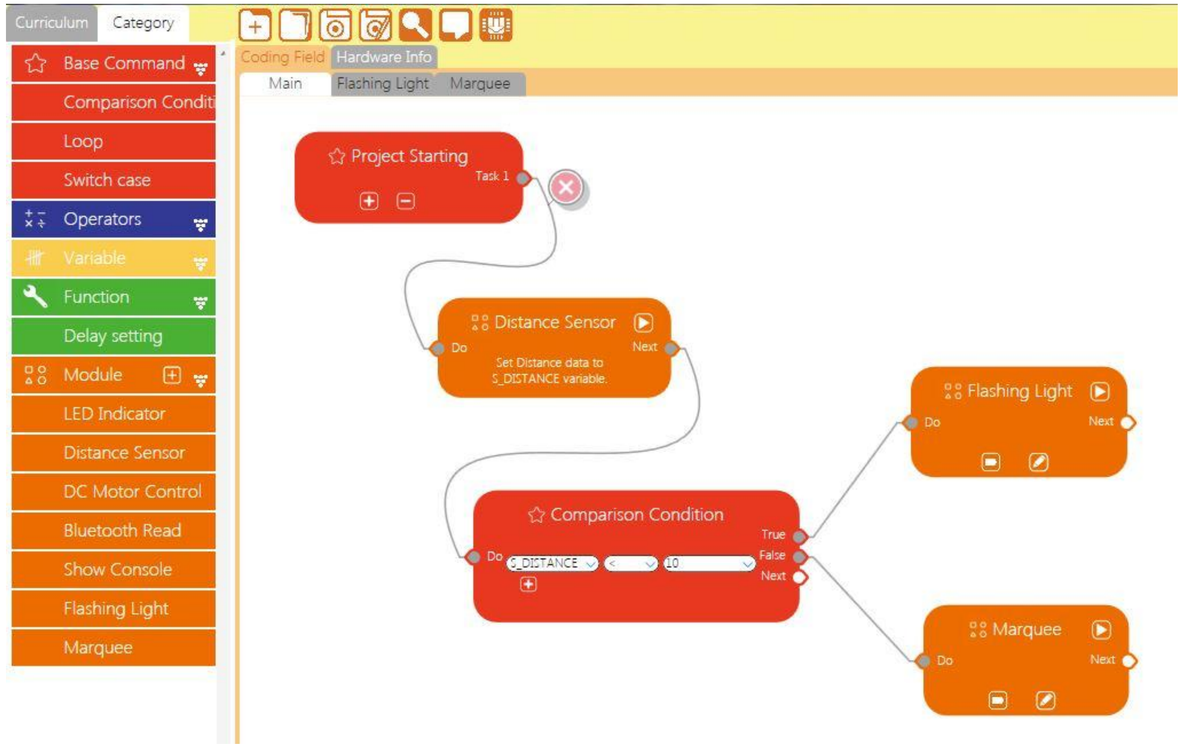


Compare command
Function：To do 2 values comparison with optional condition
Hints：Click ” +” to add multiple conditions
Results：Actions when the condition Valid/Invalid/Next Step

Example: Design phase

- Experimental design

Use distance sensing block to compare 2 situations
- When distance is less than 10cm, LED blinking,
- When distance is larger than 10cm, LED moves raindrop,

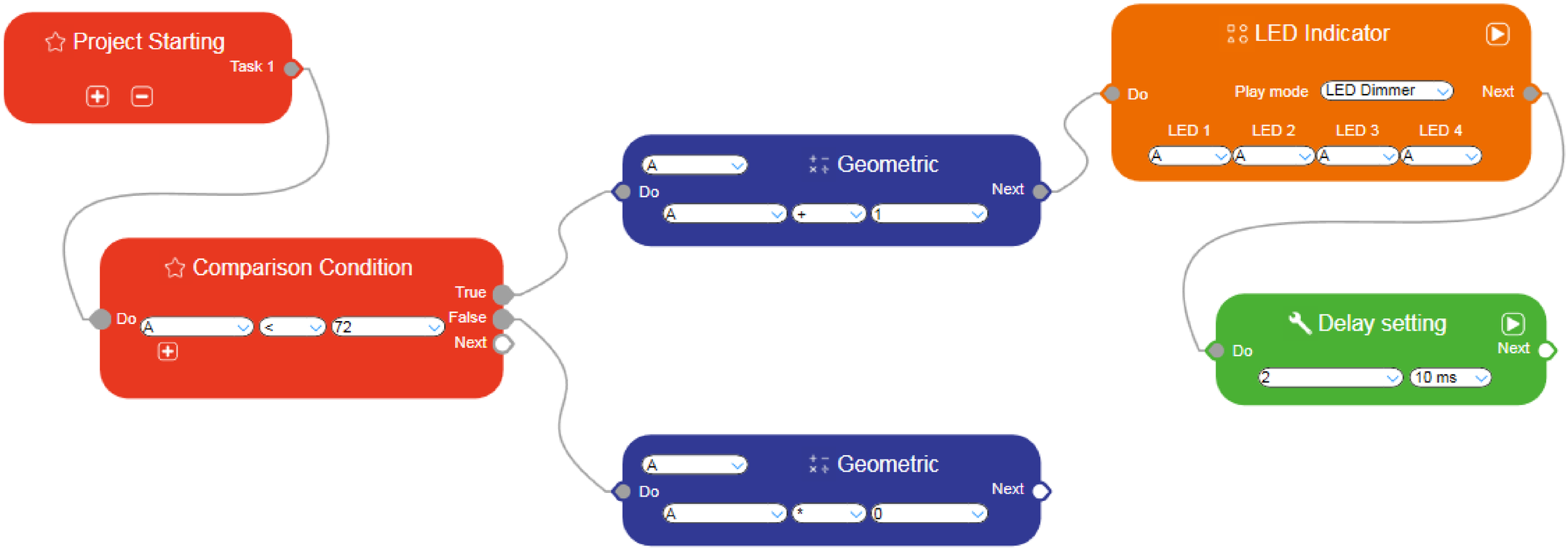


The more details on: https://tarkustech.com/en_us/curriculum/general-course-establishment-of-logical-concepts/

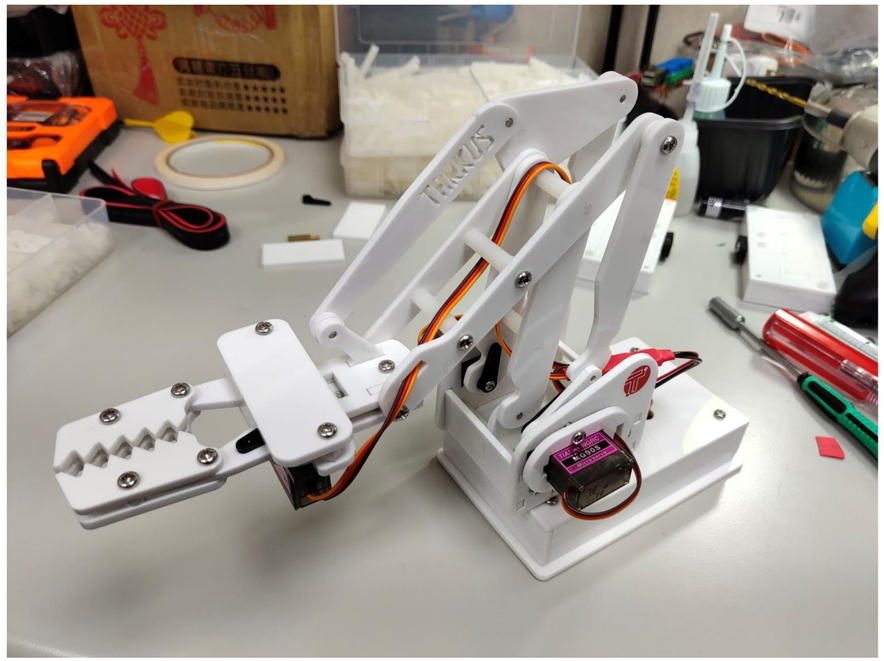
Advanced Curriculum

“Iteration” concept

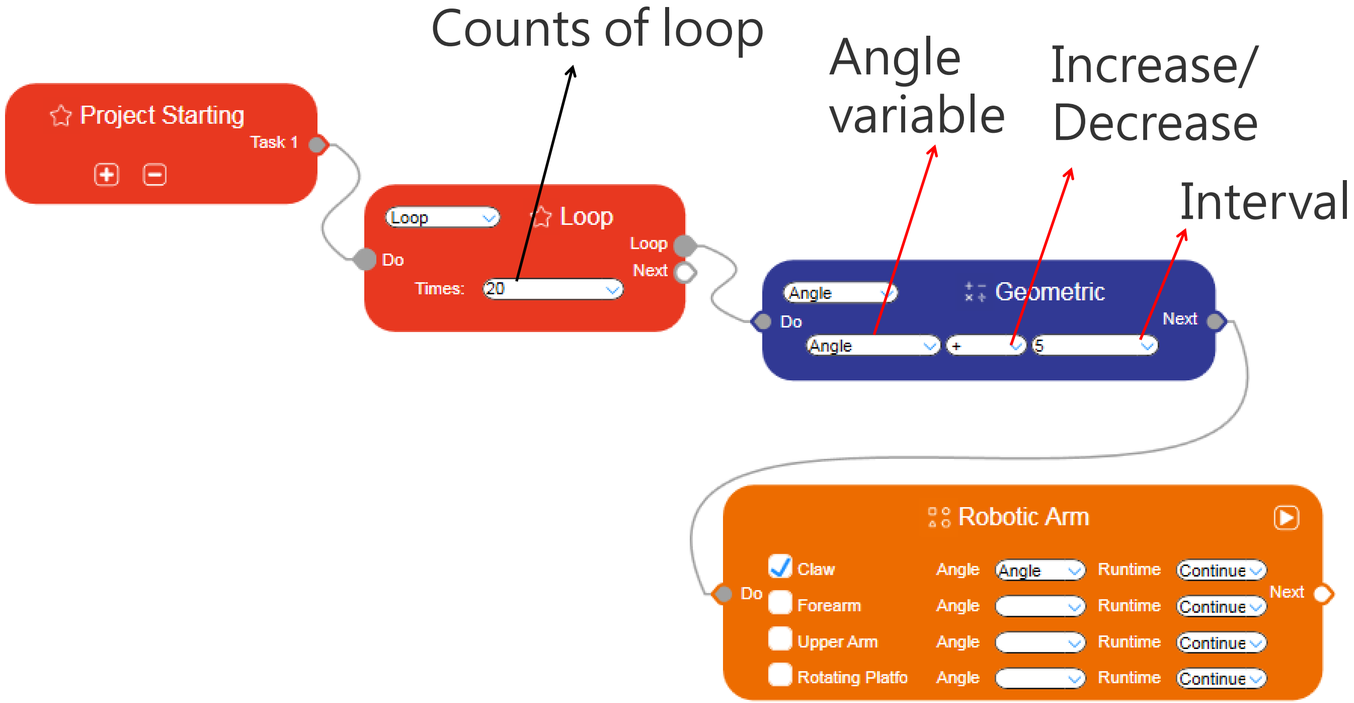
True： If value of A is less than 72, proceed new A=A+1, the LED brightness show as A value.
False： If value of A is greater than 72, proceed A=A*0 then return to starting point.

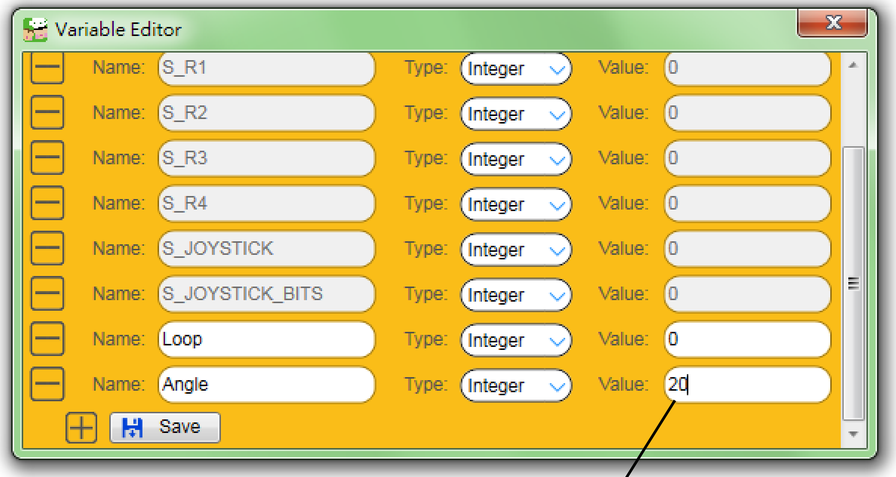


” FOR Loop” concept

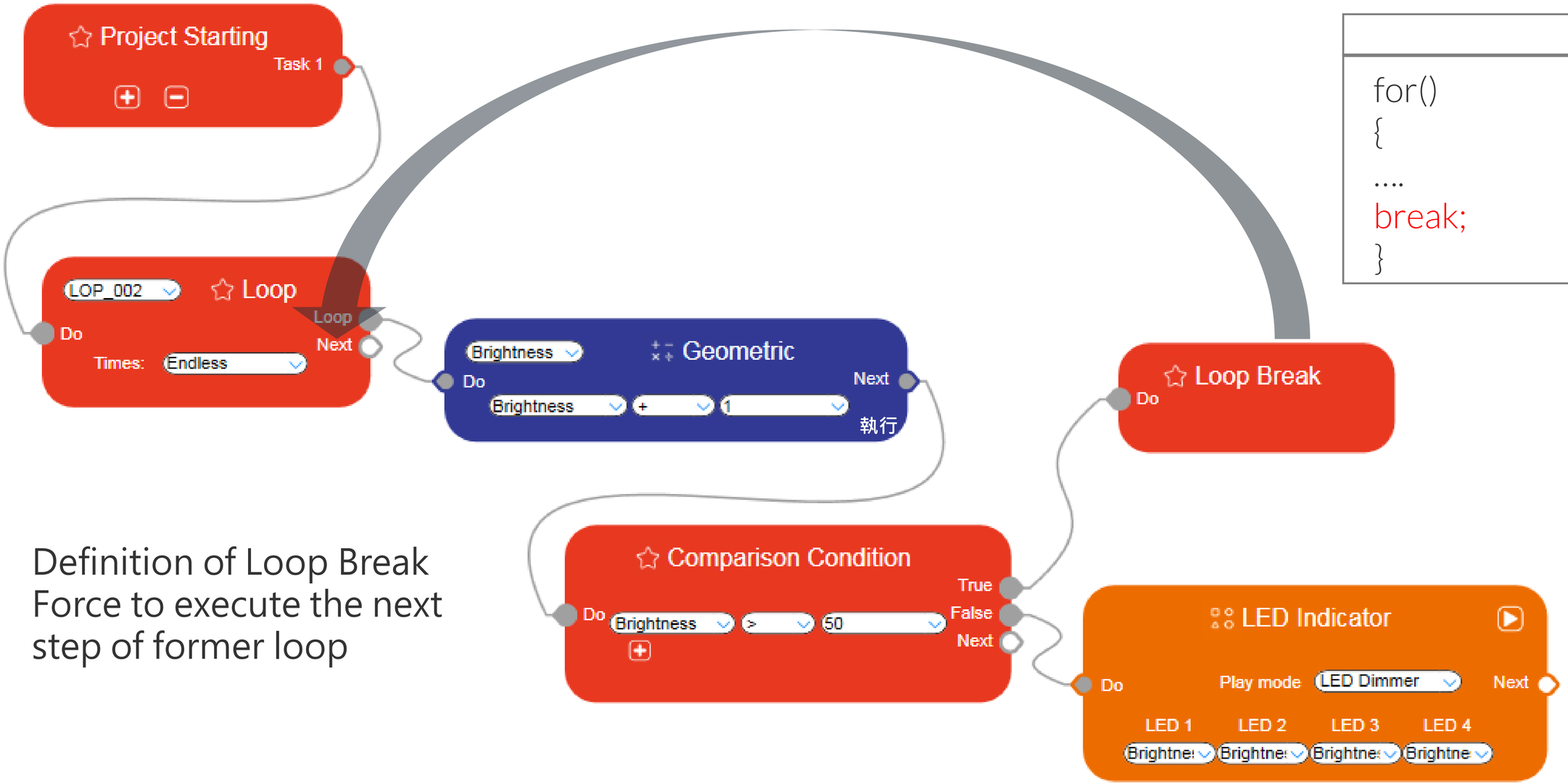


1. For loop definition
2. The Servo motor:
   - min value is 0.
   - Max value of claw is 90.
   - Max value of other parts are 180.



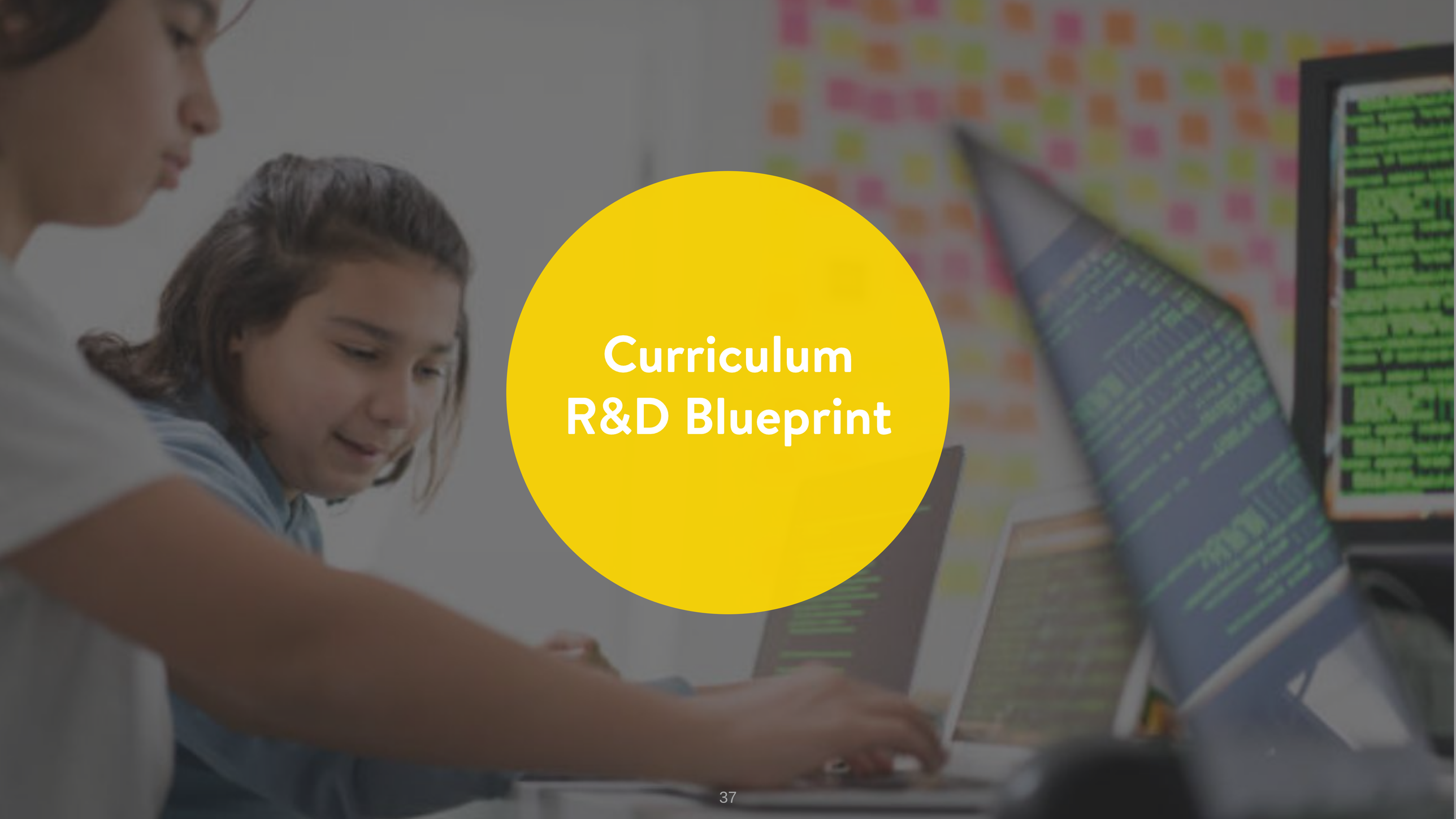


“While Loop” concept



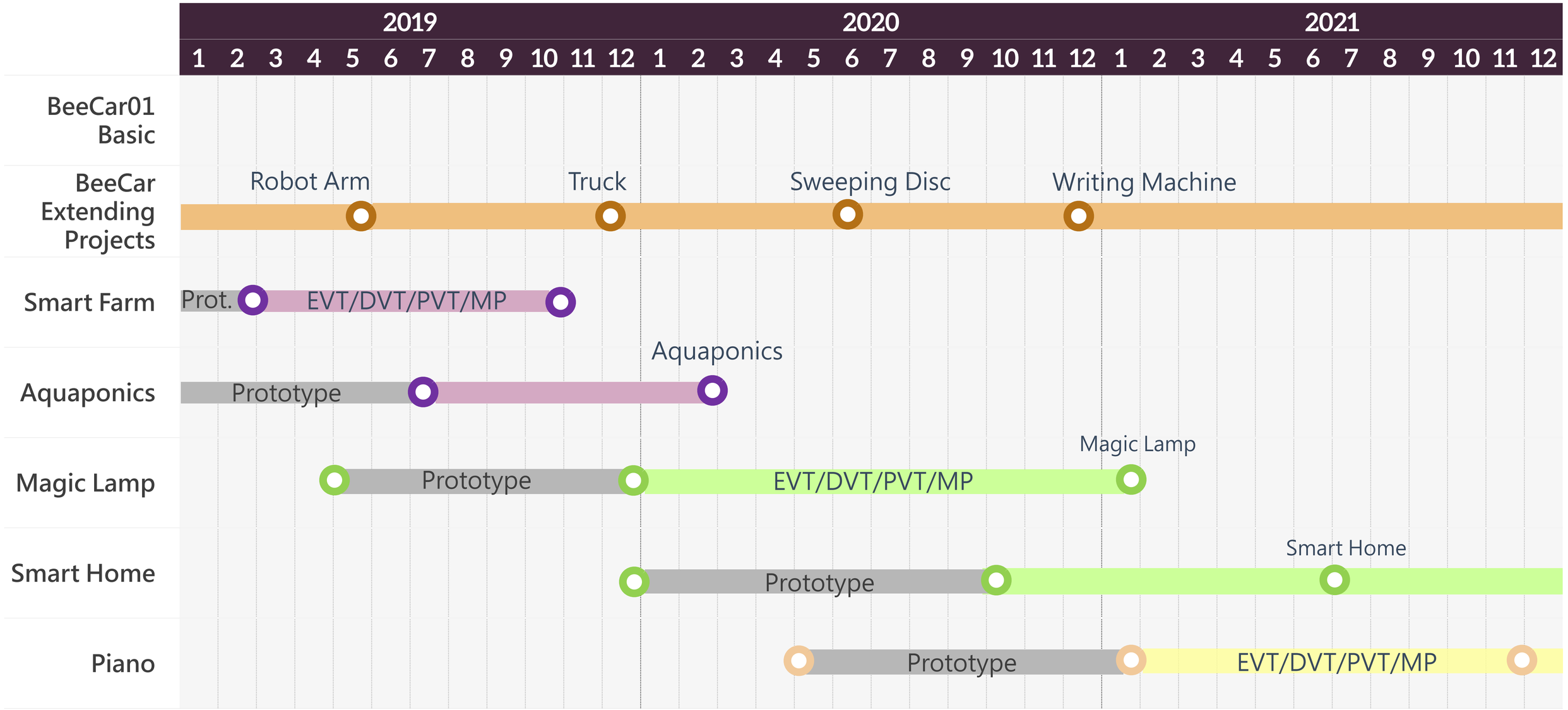

```
for()
{
....
break;
}
```

Definition of Loop Break
Force to execute the next step of former loop



Curriculum R&D Blueprint

Curriculum Roadmap – 2019~2021

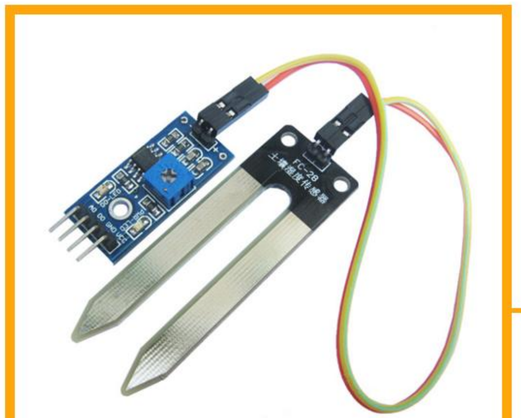


Learning Map & Application Links

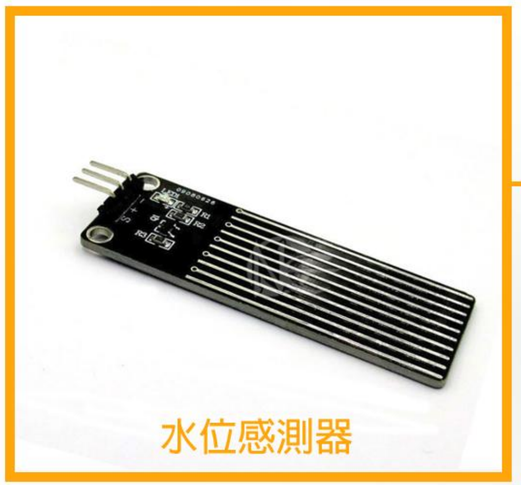
	Stage 1 Basic Foundations	Stage 2 Multiple Systems	Stage 3 Communications	Stage 4 AI & IoT Beginners
Automobile	BeeCar & HC-06 →	CMUCAM5 →	ESP32-CAM →	Raspberry Pi
Learning Field	Mechanics & Sensors Robotic Foundations	Color Recognition Video Recognition	Video Streaming & Face Recognition	Machine learning Deep Learning
Link Language	Arduino IDE	Arduino IDE/ Python	Arduino IDE/ MicroPython	Processing & OpenCV Tensorflow
Smart Farm	Basic Smart Farm →	QuickBLE(nRF 51822) →	ESP32-CAM →	Raspberry Pi
Learning Field	Automated Farm Sensors Foundations	Aquaponics	Photo Capture & Object Recognition	Cloud Computing Big data fundamental
Link Language	Arduino IDE	Arduino IDE	Arduino IDE/ MicroPython	Node-Red
Smart Home	Basic Magic Lamp →	CubexUS(ESP8266) →	ESP32-CAM →	Raspberry Pi
Learning Field	Mix-Color Bulb & Sensor Chromatics Foundations	WiFi Mesh Network	Voice Recognition/ Video Streaming	Voice Translation
Link Language	Arduino IDE	Arduino IDE	MicroPython	Python

TARKUS innovation

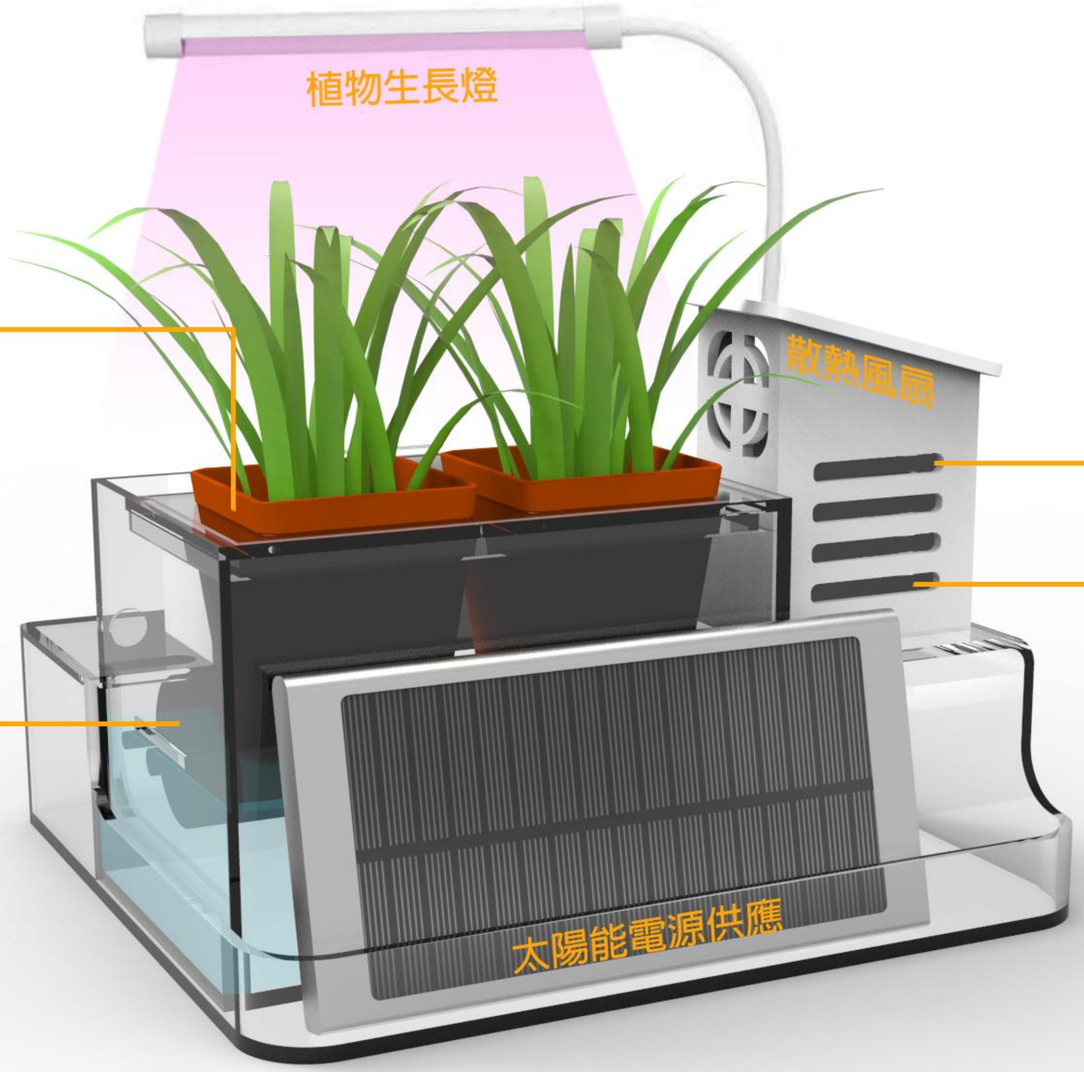
Smart farm in progress

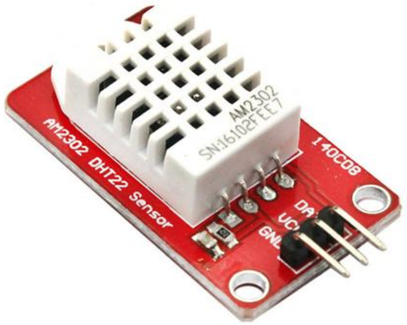


土壤溼度感測器

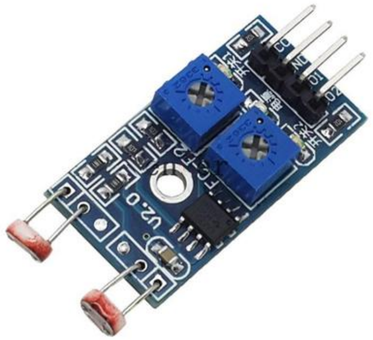


水位感測器





溫溼度感測器



光敏感測器

The more reference & videos in class

Advanced Curriculum intro
https://reurl.cc/vr96l

Recent Activities
https://tarkustech.com/zh_tw/%e6%b4%bb%e5%8b%95%e8%b3%87%e8%a8%8a/

Summer camp for MelaCake

https://reurl.cc/57xm7 Course records

https://reurl.cc/7Z8a1 Videos

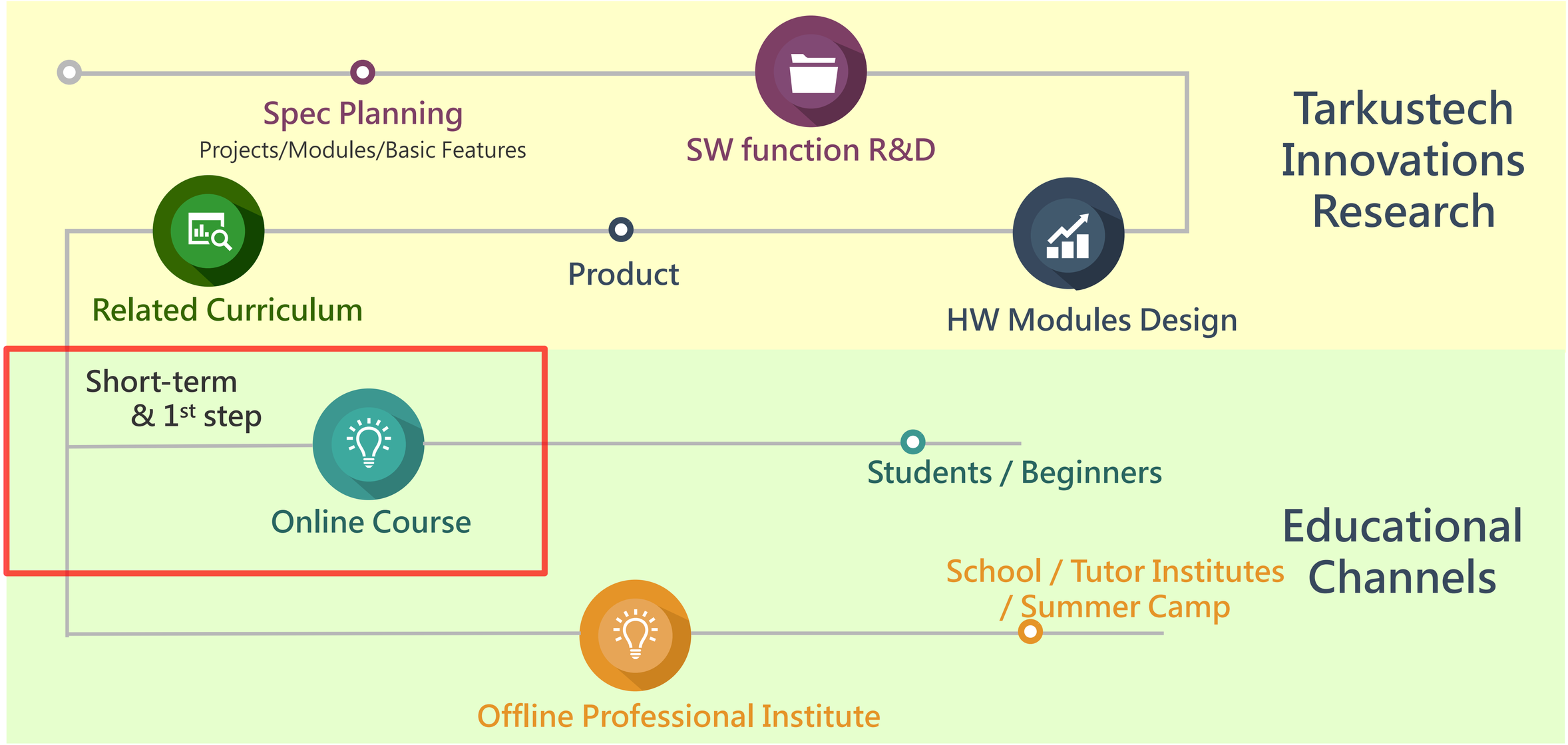
WE ARE LOOKING FOR PARTNER WHO IS…

1. Required
   - Focus on operations of online education platform and interesting in education of K4~K9 coding and programming fields.

2. Better
   - Experience in conducting to ES and MS international schools in Vietnam.
   - Offline service site to provide product inquiries, and entity course in advance

Partners Cooperation

B2B/O2O Cooperation



Resource arrangement

	Curriculum on official website	Support on official website	Online Course (Students/Beginners)	Online Course (Teachers Resources)	Cloud resource for Channels
Slides	√	√	√	√	√
Videos	√		√	√	√
Demo Files		√	√	√	√
Course gadgets & Instructions		√		√	√
Course Guiding & Introduction			√		
Course Outline	√			√	√
Reference of Course planning				√	√
Reference plan of teaching steps				√	√
Textbook and Handouts				√	√
Project Sharing				√	
Advanced Examination			√	√	√

Opportunity to co-operate in…

	Short term	Middle	Longterm goals
Online Courses / Service	• We provide a full package of curriculum needs including the teach aids, lessons plan, videos, slides and handouts. The tools of demonstration file, test and homework, course gadgets are prepared as well.		• Combine to course in international school • Certificate related to progression and career
Offline service	• Provide after-sales inquiries/repair service • A site for spare parts storage and refurbish	• Offline service site for demos, general course, and activities • Training professional seed teachers /Sales • One-on-one private classes business is possible	• Competitions and activities link to TW and HK • Provide the teachers qualification certificate • Tutoring institute alliance

Opportunity to get profits from…

	Revenue Streams	Costs
Online Courses / Service	• Revenue from online courses and learning certificate	• Course developments and field verifications • Material cost and Shipping • Online system maintenance • After-sale service • Promotion and Marketing
Offline service site for general course, camps, and activities	• Registration fee from course, camps, and activities	• Field • Teachers • Admissions activities
one-on-one private classes	• Extracting profit share from one-on-one private classes	• Teachers salary, rewards, and bonus
Teachers qualification certificate	• Registration fee	• Development and field verifications • Online system maintenance

THANK YOU!

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