JRMP 2026_Group 09
Highlights

Metric	JRMP 2026_Group 09 Achievements
Lectures	25+ Core & Guest Lectures
Workshops	4+ Practical AIoT Sessions
Assignments	12+ Continuous Assessments
Conferences	1 International Conference (with Nobel Laureate)
Competitions	1 National Competition
Publications	2 Research Publications

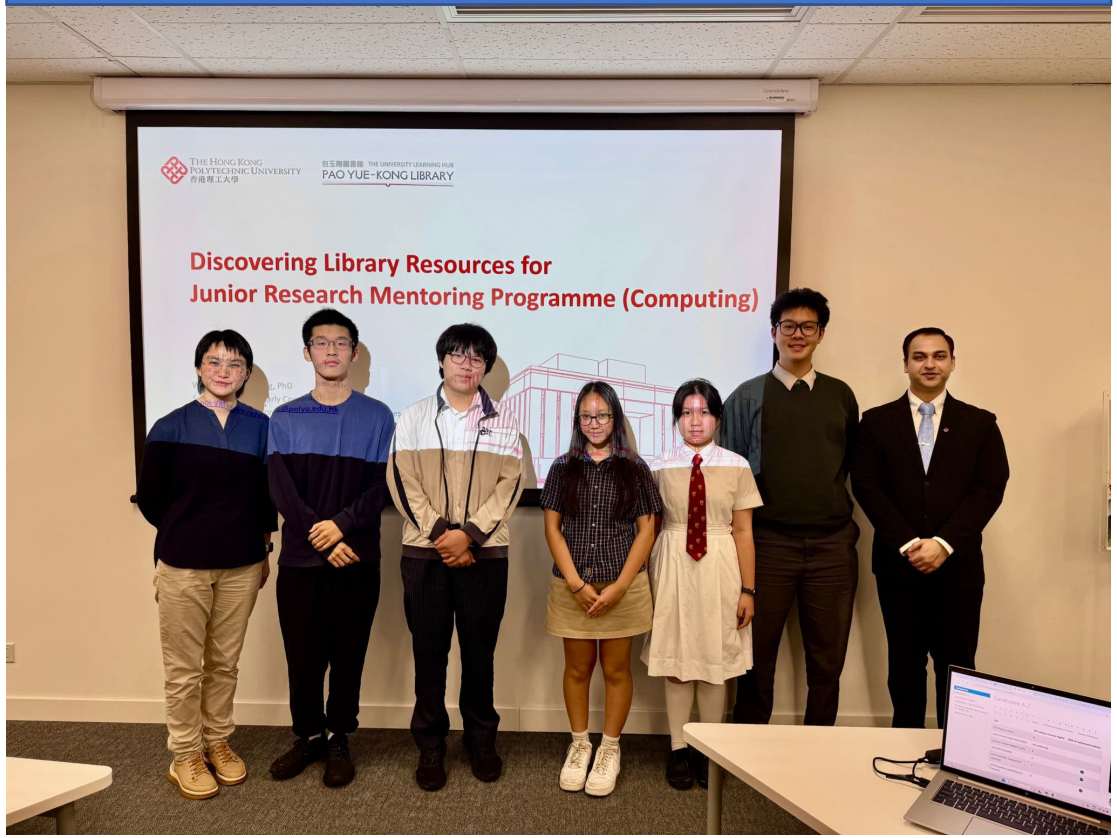
Lecture Topics

JRMP2026_09 Lectures Attendance Records				
Week	**Lecture**	**Day**	**Date**	**Topic**
1	1	Wed	Apr-01	Prootocls
	2	Fri	Apr-03	Functional Programming
	3	Sat	Apr-04	Python Programming
2	4	Tue	Apr-07	Sensors & MQTT
	5	Wed	Apr-08	Demos of Sensors & MQTT
	6	Th	Apr-09	Data Types and Assignment 1 Discussion
	7	Fri	Apr-10	Embessed Systems Environment Setup
3	8	Mon	Apr-13	How to do research?
	9	Tue	Apr-14	Programming using Microcontrollers
	10	Fri	Apr-17	Assignment 2 Discussion
4	11	Mon	Apr-21	Propositional Logic I
	12	Tue	Apr-22	Microcontroller Programming I
5	13	Mon	Apr-28	Microcontroller Programming II
	14	Tue	Apr-29	Propositional Logic II
	15	Sat	May-02	Type Theory I & Assignment 5 Explain
6	16	Mon	May-05	Dashboard I
	17	Tue	May-06	Programming - Logic
7	18	Mon	May-18	Dashboard II & Assignment 6
	19	Tue	May-19	Programming - Natural Numbers
8	20	Mon	May-25	Setting up Rust Environment
	21	Tue	May-26	Programming - Tuples & Recursion
9	22	Wed	Jun-03	Introduction to Hotaru Framework Research
	22	Sun	Jun-07	Trouble shoot for Dashboard & Rust

JRMP2026_09 Orientation Day with Associate Director Mr. Frank Chow

ISBDAI Conference with Nobel Laureate Prof. Ferenc Krausz, Germany

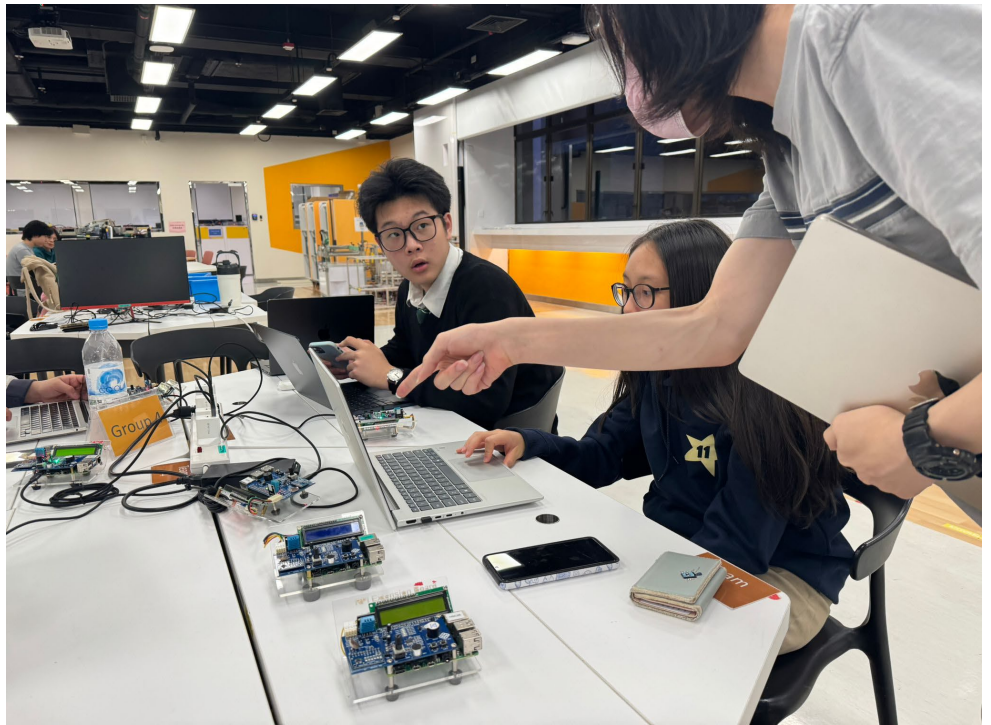
PolyU Library Tour and Resources Hands-on-Workshop by Ms. Wendy Hoi Yan (Senior AL)



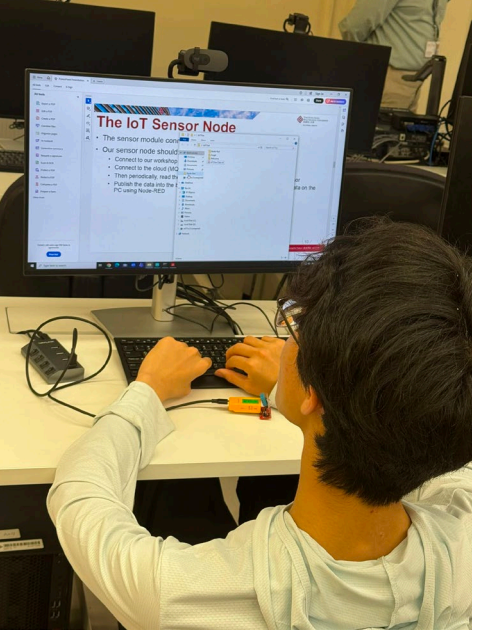
Robotics & AIoT Plenary Workshop by Sinovated Technology Limited, Hong Kong

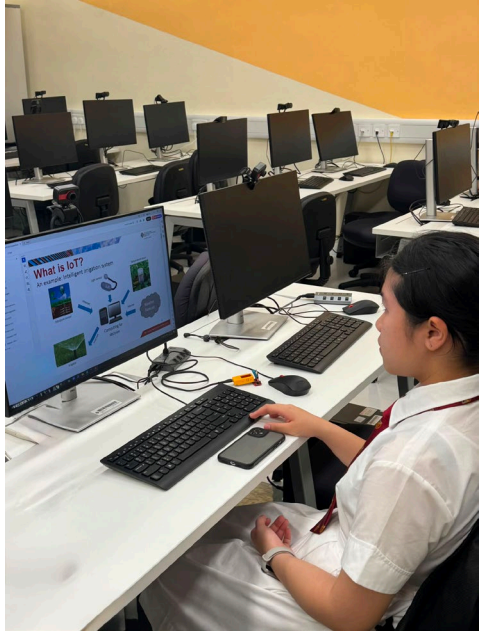
Mentee Luncheon with JRMP_09 PolyU Student Communal Canteen

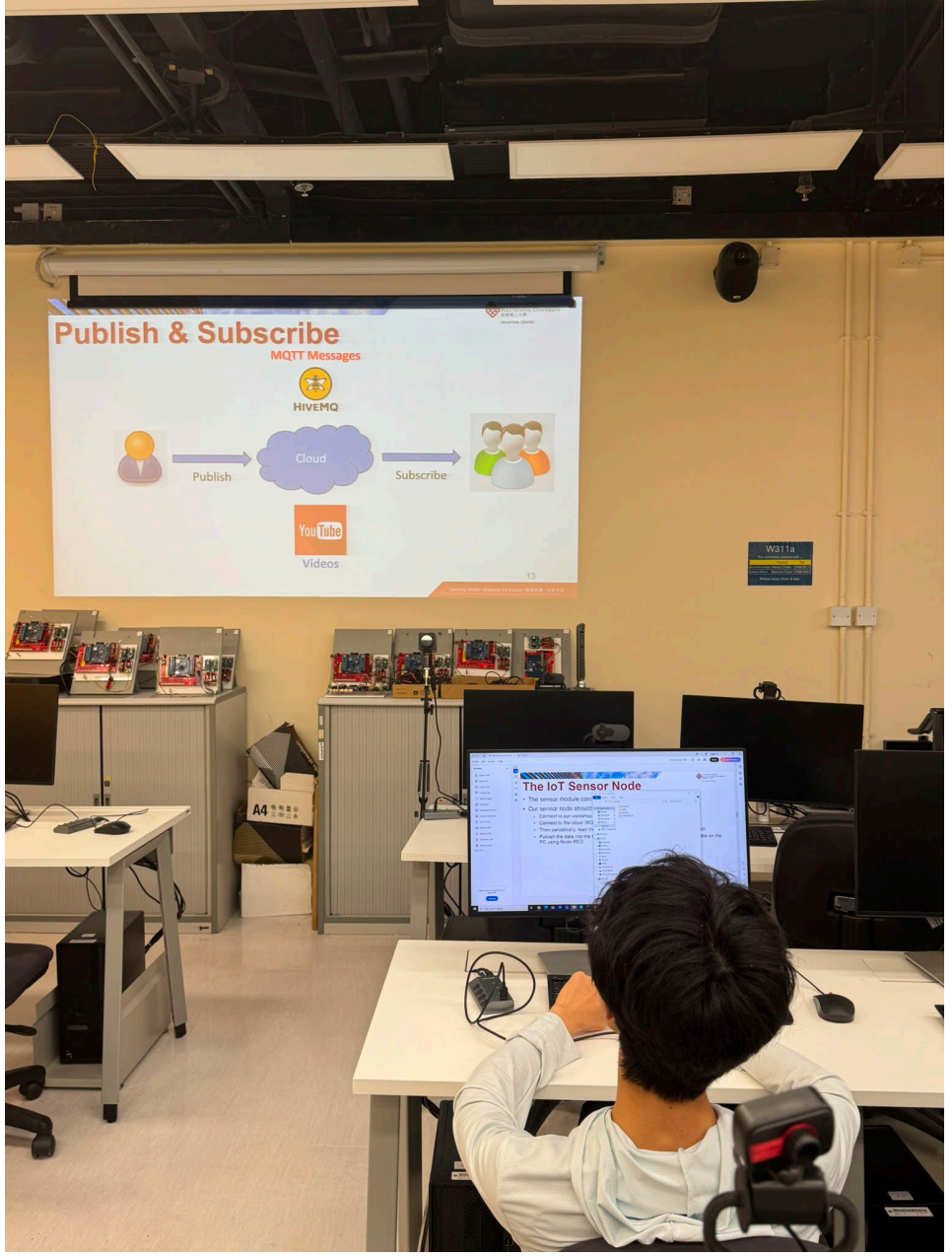
First AIoT workshop at Industrial Centre with Mr. Henry Chan, Engineering Manager

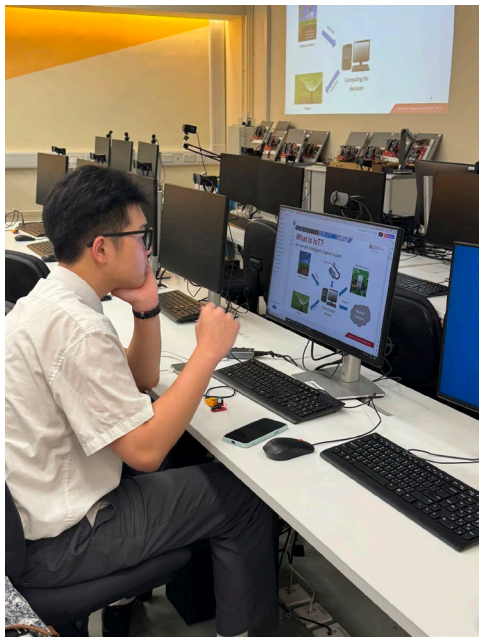


AIoT Lectures





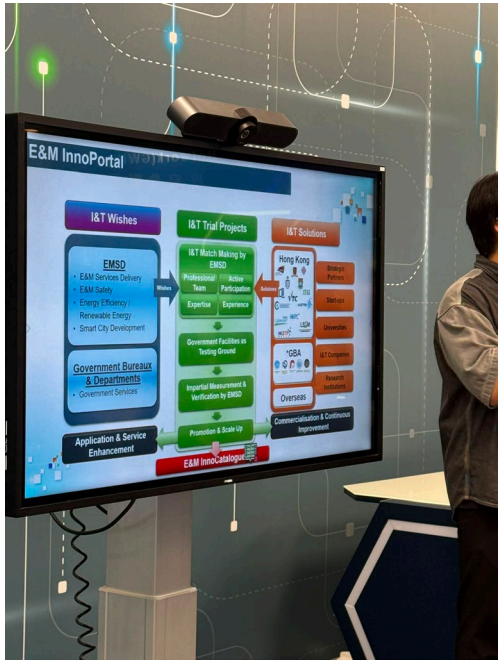


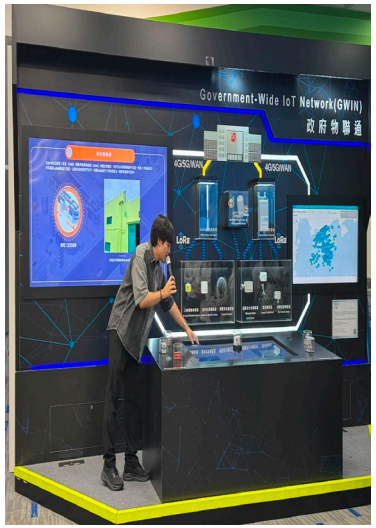


AIoT Workshop

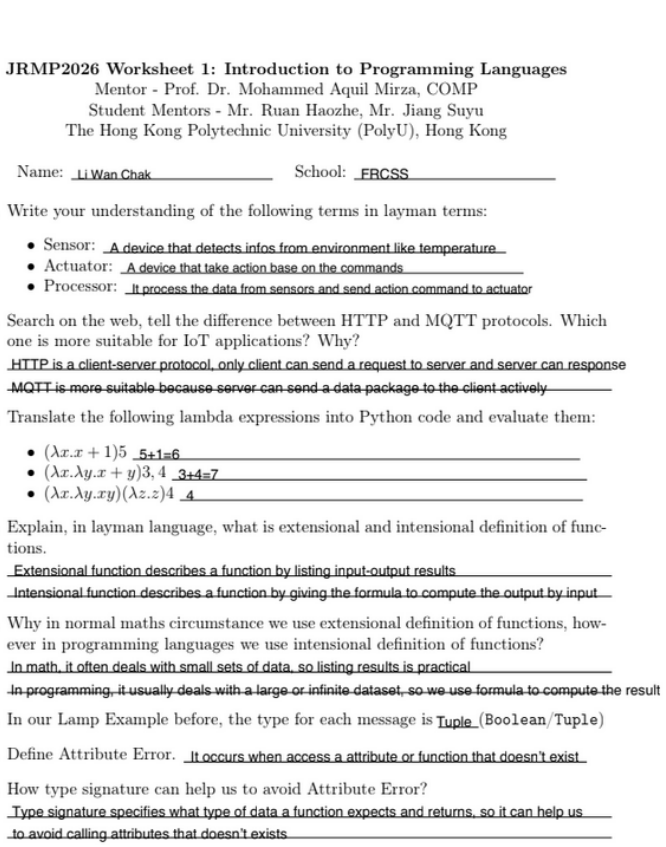
2026 IET Young Professionals Competition

Briefing & EMSD Tour





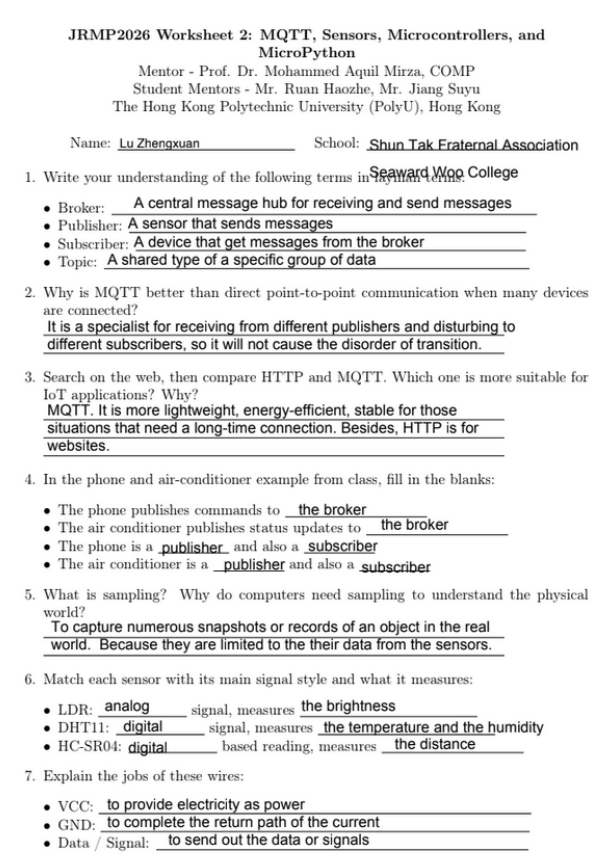
Student Assignment Submissions



JRMP2026 Worksheet 1: Introduction to Programming Languages
Mentor - Prof. Dr. Mohammed Aquil Mirza, COMP
Student Mentors - Mr. Ruan Haozhe, Mr. Jiang Suyu
The Hong Kong Polytechnic University (PolyU), Hong Kong

Name: Li Wan Chak School: FRCSS

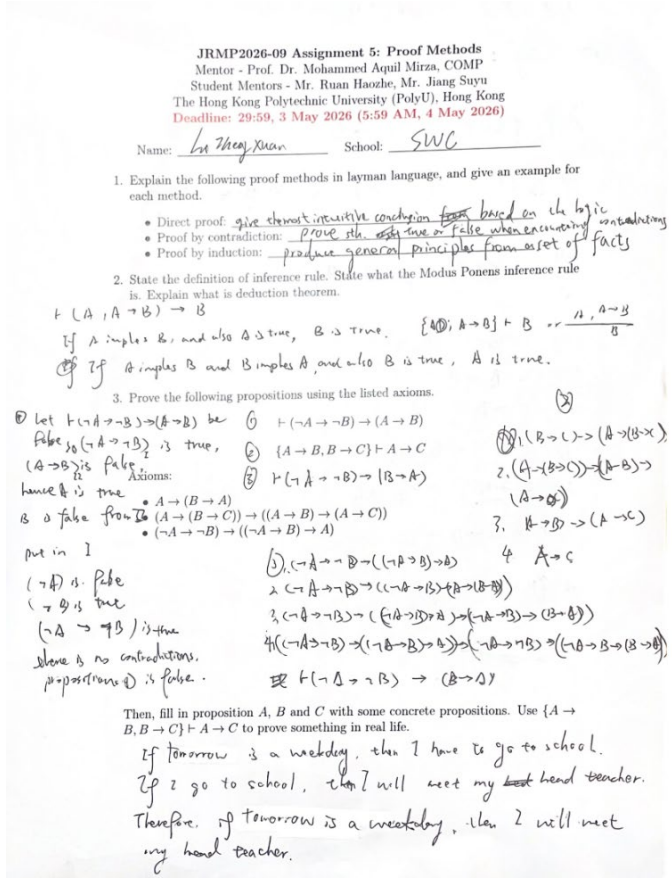
1. Write your understanding of the following terms in layman terms:
   - Sensor: A device that detects infos from environment like temperature
   - Actuator: A device that take action base on the commands
   - Processor: It process the data from sensors and send action command to actuator
2. Search on the web, tell the difference between HTTP and MQTT protocols. Which one is more suitable for IoT applications? Why?
   HTTP is a client-server protocol, only client can send a request to server and server can response
   MQTT is more suitable because server can send a data package to the client actively
3. Translate the following lambda expressions into Python code and evaluate them:
   - $(\lambda x.x + 1)5$ 5+1=6
   - $(\lambda x.\lambda y.x + y)3, 4$ 3+4=7
   - $(\lambda x.\lambda y.xy)(\lambda z.z)4$ 4
4. Explain, in layman language, what is extensional and intensional definition of functions.
   Extensional function describes a function by listing input-output results
   Intensional function describes a function by giving the formula to compute the output by input
5. Why in normal maths circumstance we use extensional definition of functions, however in programming languages we use intensional definition of functions?
   In math, it often deals with small sets of data, so listing results is practical
   In programming, it usually deals with a large or infinite dataset, so we use formula to compute the result
6. In our Lamp Example before, the type for each message is Tuple (Boolean/Tuple)
7. Define Attribute Error. It occurs when access a attribute or function that doesn't exist
8. How type signature can help us to avoid Attribute Error?
   Type signature specifies what type of data a function expects and returns, so it can help us to avoid calling attributes that doesn't exists



JRMP2026 Worksheet 2: MQTT, Sensors, Microcontrollers, and MicroPython
Mentor - Prof. Dr. Mohammed Aquil Mirza, COMP
Student Mentors - Mr. Ruan Haozhe, Mr. Jiang Suyu
The Hong Kong Polytechnic University (PolyU), Hong Kong

Name: Lu Zhengxuan School: Shun Tak Fraternal Association Seaward Woo College

1. Write your understanding of the following terms in layman terms:
   - Broker: A central message hub for receiving and send messages
   - Publisher: A sensor that sends messages
   - Subscriber: A device that get messages from the broker
   - Topic: A shared type of a specific group of data
2. Why is MQTT better than direct point-to-point communication when many devices are connected?
   It is a specialist for receiving from different publishers and disturbing to different subscribers, so it will not cause the disorder of transition.
3. Search on the web, then compare HTTP and MQTT. Which one is more suitable for IoT applications? Why?
   MQTT. It is more lightweight, energy-efficient, stable for those situations that need a long-time connection. Besides, HTTP is for websites.
4. In the phone and air-conditioner example from class, fill in the blanks:
   - The phone publishes commands to the broker
   - The air conditioner publishes status updates to the broker
   - The phone is a publisher and also a subscriber
   - The air conditioner is a publisher and also a subscriber
5. What is sampling? Why do computers need sampling to understand the physical world?
   To capture numerous snapshots or records of an object in the real world. Because they are limited to the their data from the sensors.
6. Match each sensor with its main signal style and what it measures:
   - LDR: analog signal, measures the brightness
   - DHT11: digital signal, measures the temperature and the humidity
   - HC-SR04: digital based reading, measures the distance
7. Explain the jobs of these wires:
   - VCC: to provide electricity as power
   - GND: to complete the return path of the current
   - Data / Signal: to send out the data or signals



JRMP2026-09 Assignment 5: Proof Methods
Mentor - Prof. Dr. Mohammed Aquil Mirza, COMP
Student Mentors - Mr. Ruan Haozhe, Mr. Jiang Suyu
The Hong Kong Polytechnic University (PolyU), Hong Kong
Deadline: 29:59, 3 May 2026 (5:59 AM, 4 May 2026)

Name: Lu Zhengxuan School: SWC

1. Explain the following proof methods in layman language, and give an example for each method.
   - Direct proof: give the most intuitive conclusion from based on the logic
   - Proof by contradiction: prove sth. is true or false when encountering contradictions
   - Proof by induction: produce general principles from a set of facts
2. State the definition of inference rule. State what the Modus Ponens inference rule is. Explain what is deduction theorem.
   If A implies B, and also A is true, B is true.
   If A implies B and B implies A, and also B is true, A is true.
3. Prove the following propositions using the listed axioms.
   Axioms:
   - $A \to (B \to A)$
   - $(A \to (B \to C)) \to ((A \to B) \to (A \to C))$
   - $(\neg A \to \neg B) \to ((\neg A \to B) \to A)$

   Then, fill in proposition A, B and C with some concrete propositions. Use $\{A \to B, B \to C\} \vdash A \to C$ to prove something in real life.
   If tomorrow is a weekday, then I have to go to school.
   If I go to school, then I will meet my head teacher.
   Therefore, if tomorrow is a weekday, then I will meet my head teacher.

Smart Classroom Implementation