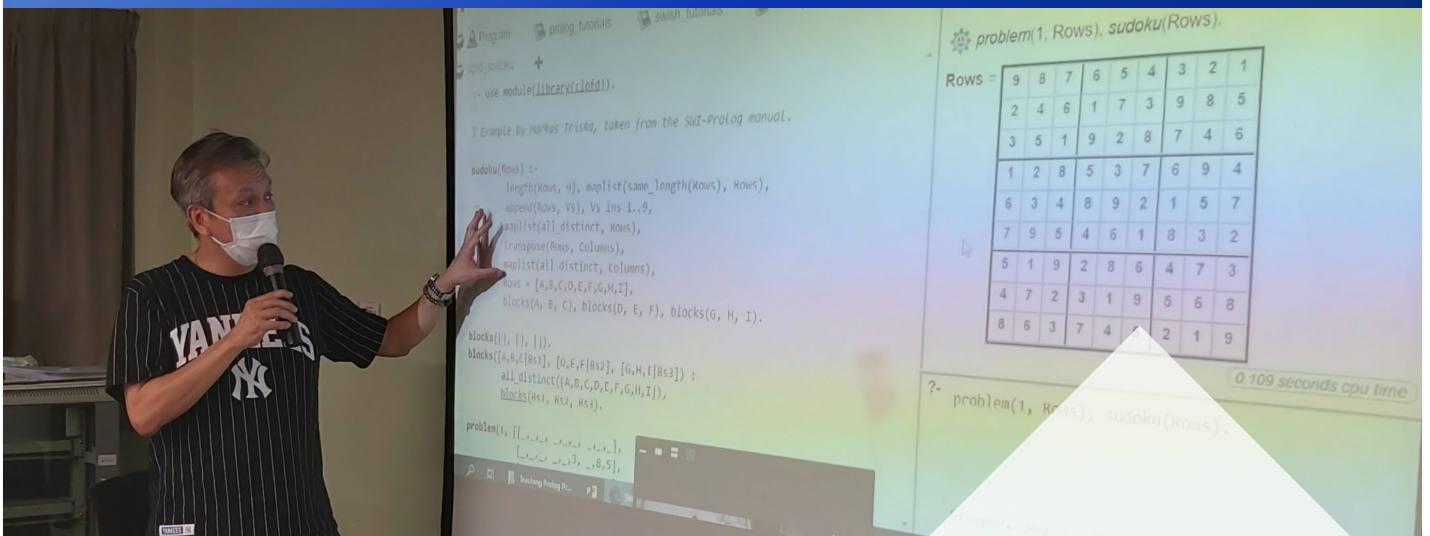




Coding Course (Level II): Introduction to Prolog (Programming in Logic) for Artificial Intelligence – Thinking as Computation

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Application Deadline

23 Sep 2022

12:00 noon

Intended Learning Outcomes

Upon completion of the programme, participants should be able to:

1. Describe the basics of Prolog, including list processing and arithmetic expressions.
2. Explain backtracking and negation in Prolog.
3. Outline logic foundations of Prolog.
4. Recognise the use of Prolog in constraint solving problem (e.g., sudoku) and simple planning problems.
5. Discuss whether AI could be a threat to human dignity.



◆ Introduction

Prolog is a widely used programming language in artificial intelligence (AI). As opposed to imperative languages (C or Python), it is a declarative language. When implementing the solution to a problem in Prolog, we simply specify what the situation (rules and facts) and the goal (query) are. Then, we let the Prolog interpreter automatically derive the solution. In this course, you will learn how to use Prolog to solve some practical problems in computer science. Its use in some AI problems will be illustrated. Besides, the logical foundations of Prolog will be briefly touched upon.

◆ Schedule

Session	Date	Time	Venue
1	7 Oct	4:30 p.m. – 6:30 p.m.	Multimedia Learning Centre (MMLC), SKH Bishop Baker Secondary School, 10 Fung Yau Street South, Yuen Long (MAP)
2	14 Oct		
3	21 Oct		
4	28 Oct		
5	4 Nov		
6	11 Nov		

◆ Target Participants

- S3 – S6 HKAGE student members only in 2022/23 school year
- Class size: 15
- * First-come, first-served

◆ Pre-requisite

- Students should be good at analytical thinking.
- Some minimal experiences in computer programming (e.g., C or Python) are required.
- Basic computer skills in Windows.

◆ Medium of Instruction

Cantonese with English Handouts

◆ Certificate


E-Certificate will be awarded to participants who have:

- attended at least 5 sessions; and
- completed all the assignments with satisfactory performance.



◆ Sample Notes

```
edge(a, b).  
edge(b, c).  
edge(b, d).  
edge(d, e).  
edge(d, f).  
  
path(X, Y) :- edge(X, Y).  
path(X, Y) :- edge(X, Z), path(Z, Y).
```

 path(b, X).

X = c

X = d

X = e

X = f

false

Prolog Program:

```
child(john,sue). child(john,sam).  
male(john). male(sam). female(sue).  
parent(Y,X) :- child(X,Y).  
father(Y,X) :- child(X,Y), male(Y).
```

This program is equivalent to a set of first-order logic formulas:

Child(John, Sue). Child(John, Sam).
Male(John). Male(Sam). Female(Sue).
 $\forall x \forall y \text{ Child}(x, y) \rightarrow \text{Parent}(y, x).$
 $\forall x \forall y \text{ Child}(x, y) \wedge \text{Male}(y) \rightarrow \text{Father}(y, x).$