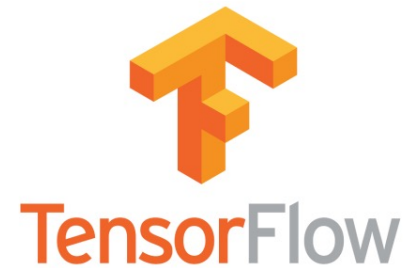
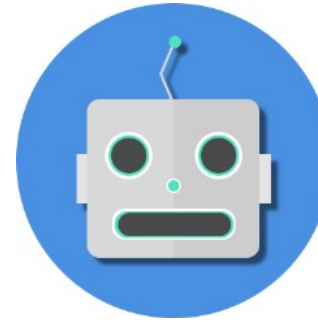
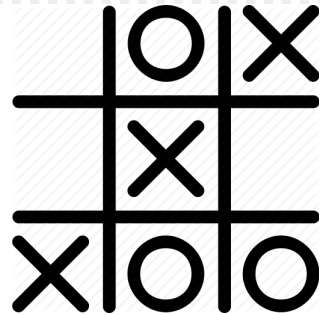
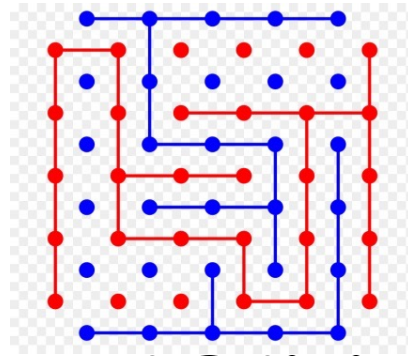
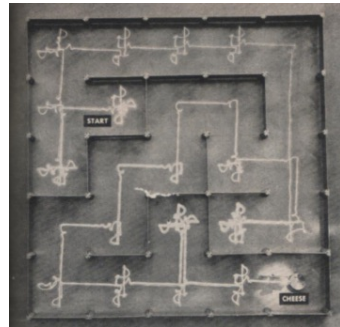
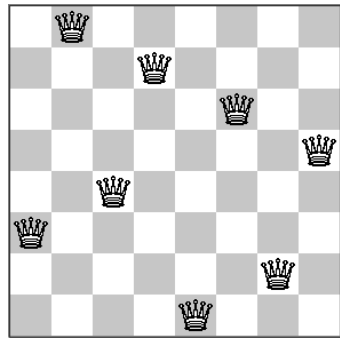


# Artificial Intelligence:

## Past, Present and Future



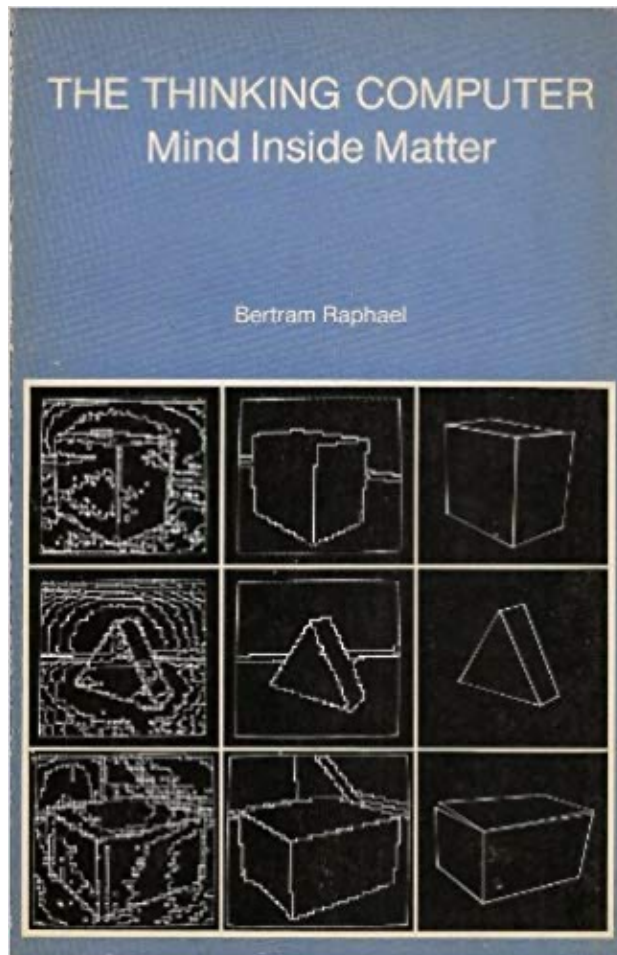
Chee Wei Tan

# Requisites and Goals

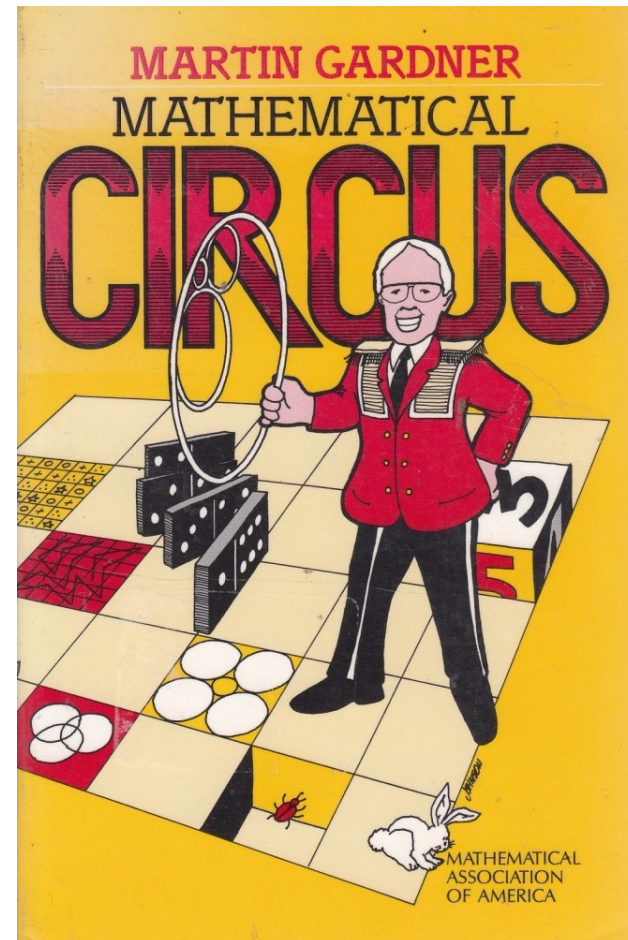
- In this course, you should have some understanding of freshman basic math (i.e., high-school math).
- Preferably, but not a must, you know some basic computer programming language (since it's useful for your coursework)
- After this course, you should know
  - Basic ideas of AI and past achievements
  - Problem solving skills
  - Critical thinking and algorithmic thinking (deep thinking)
  - Creative applications in computer science

# Reference Books

Bertram Raphael. **The Thinking Computer**. MWH Freeman and Co., 1976. ISBN: 0-7167-0723-3.



Martin Gardner. **Mathematical Circus**. The Mathematical Association of America, 1992. ISBN: 978-0883855065.



Introduction

<https://archive.org/details/thinkingcomputer00raph>

<https://archive.org/details/B-001-018-093/page/n287>

# Software for Learning

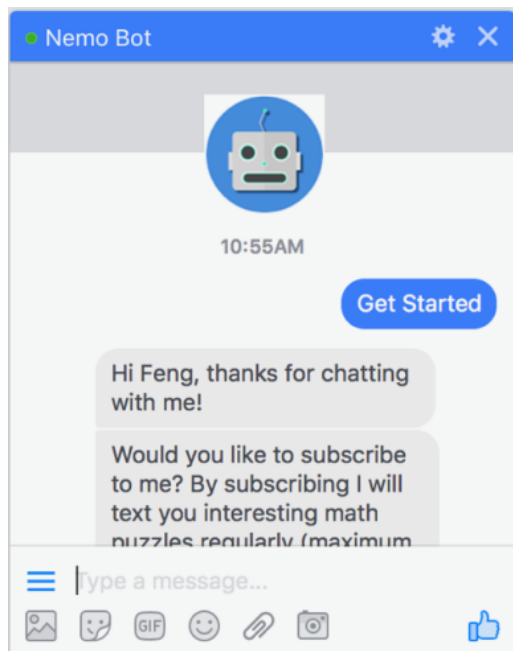
- NemoBot in Facebook Messenger

<https://www.facebook.com/Nemo-Bot-454163798317367>

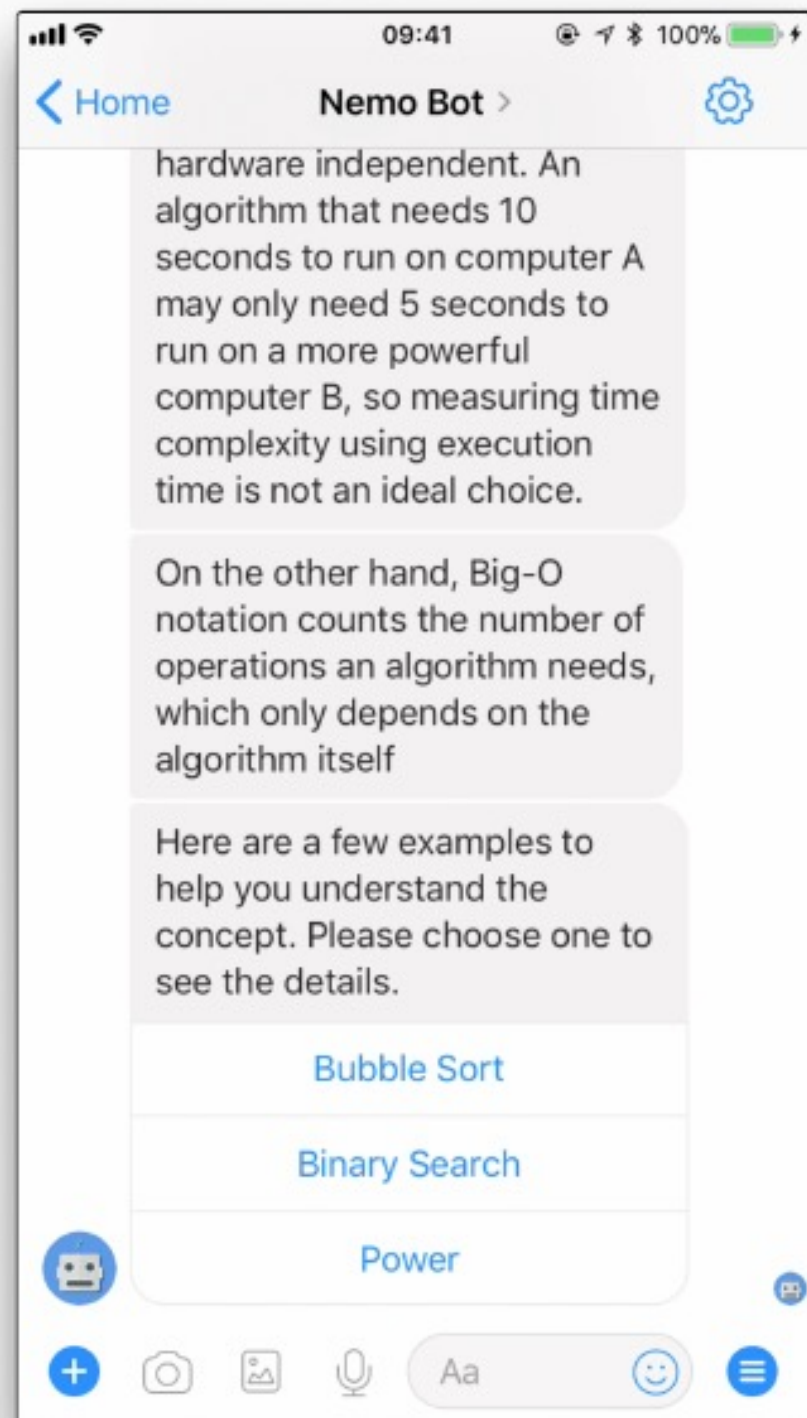
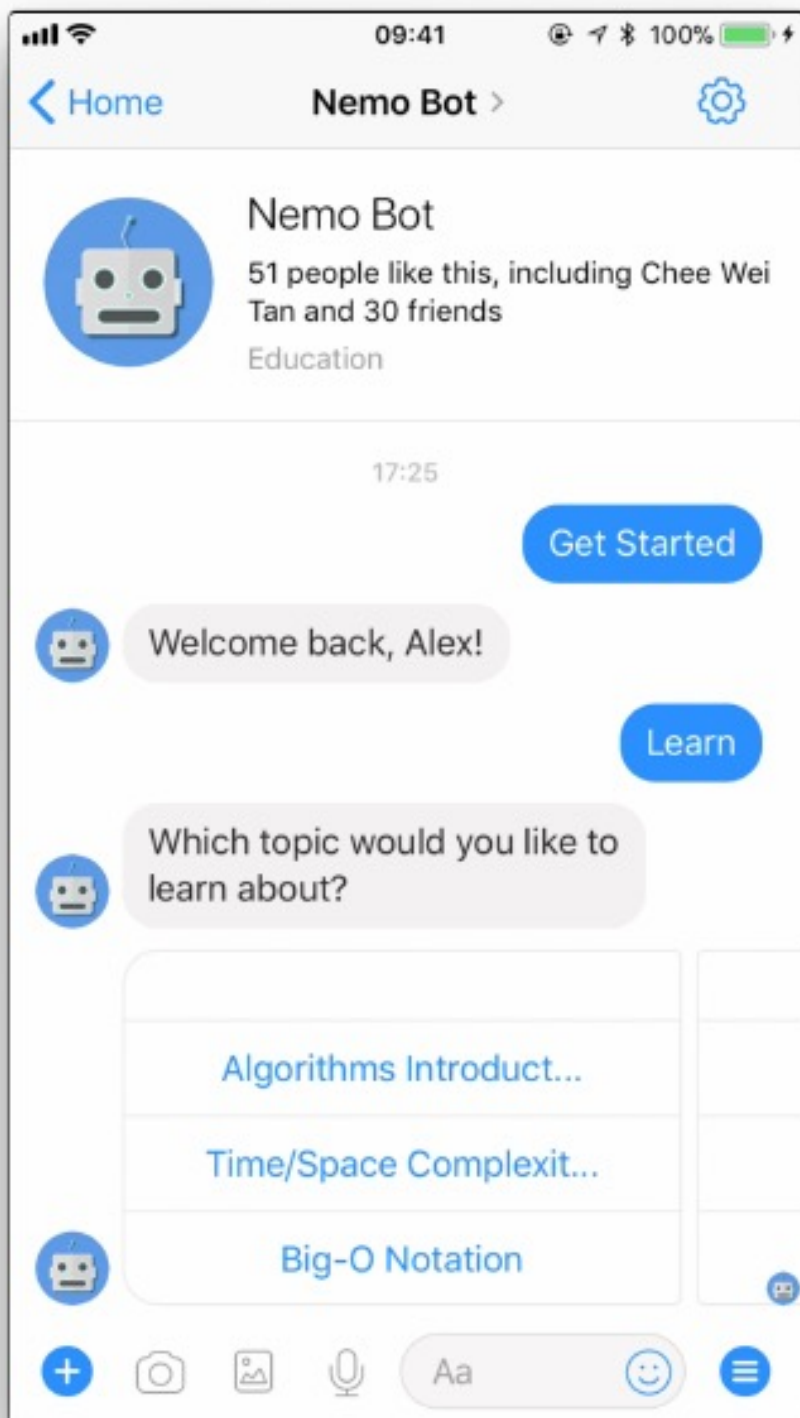
To administer pre-class and in-class quizzes that are **multiple-choice questions**

To start: Subscribe to GE2340 and select “Fetch Message” or text “fetch”!

And we teach you later how to **program this chatbot to demonstrate AI ideas**



<https://xkcd.com/329/>





Hi Dickson, here's a new puzzle for you!

I think you like Alice 😊  
So can you help Alice to solve this problem? 🤔  
In the Forest of Forgetfulness, Alice always met Lion and Unicorn 😊  
Lion and Unicorn, however, are strange creature 😞  
Lion lies on Mon, Tue and Wed and tells the truth on other days 😞  
Unicorn lies on Thur, Fri and Sat and tells the truth on other days 😞  
On one day Lion said: 🐱  
I lied yesterday and I will lie

Therefore the day must... ⌵

Send a message...

D

Your answer D is correct ✅!  
Well done!

Do you want a brief explanation on this puzzle?

Sure

One must take notice of difference between two separate statements and one statement which is the CONJUNCTION of the two 🤔

Given any two statements X and Y, if the statement: "X and Y" = true, then X, Y = true 🤖

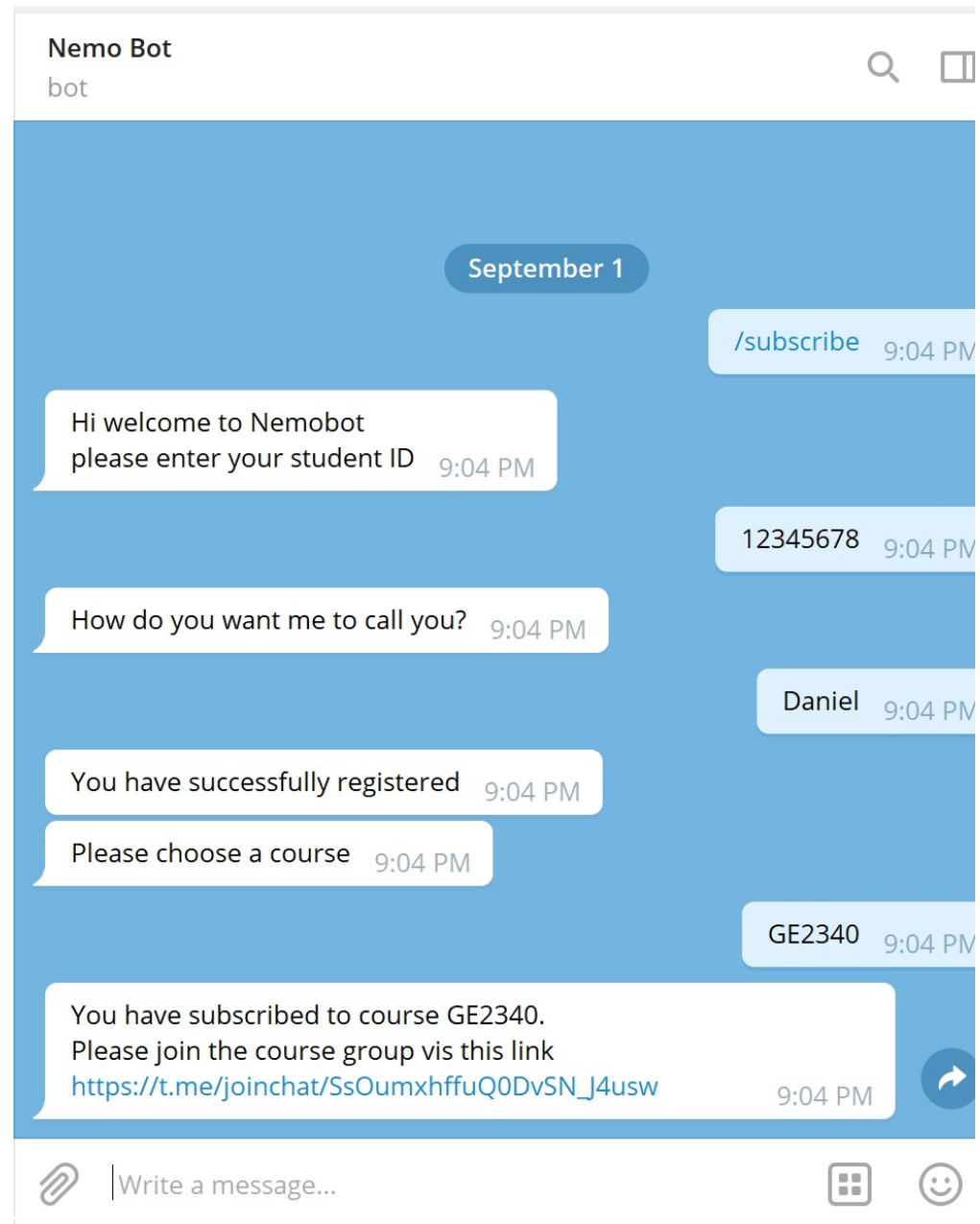
But if "X and Y" = false, at least one of X, Y = false  
Therefore the day must... ⌵

Send a message...

# NemoBot in Telegram



- As Telegram is popular nowadays in Hong Kong and worldwide, we have just added Telegram support!
- To use Nemobot in Telegram, search for @city\_nemo\_bot in telegram or visit link ([https://t.me/city\\_nemo\\_bot](https://t.me/city_nemo_bot))
- Then send “/subscribe” in Nemobot who will guide you through the subscription process



# Pre-Class and In-Class Quizzes

- Pre-class Quiz
  - MCQ and *sent out before each Lecture*, typically on Thursday
  - Related to pre-class reading, video watching
  - Around 2-3 Quiz questions and **no time limit**
- In-class Quiz
  - MCQ and *sent out during each Lecture in-class*
  - A warm-up poll first, then peer discussions and then quiz sent
  - Around 2-3 Quiz questions and **are time-limited**
- Grading of Pre-class and In-class Quizzes
  - **Typically 1 point for each correct quiz answer, and for some of the Pre-class quizzes, more points may be given (e.g., 2 points or 3 points for a more challenging one)**
  - Final score is normalized to the highest overall score, the difficulty level of the quiz and the difficulty-level spread
  - Try not to miss in-class quiz, as they are not re-issued



# Motivation

- “the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.”

– John McCarthy,

When he coined the term “artificial intelligence” in a proposal:

McCarthy, J., Minsky, M., Rochester, N., and Shannon, C., A proposal for the Dartmouth Summer Research Project in Artificial Intelligence, August 31, 1955

Reprint in AI Magazine, Vol 27, Number 4, pp 12-14, 2016.

<https://doi.org/10.1609/aimag.v27i4.1904>

A Proposal for the  
DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

*June 17 - Aug. 16*

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.

The following are some aspects of the artificial intelligence problem:

1) Automatic Computers

If a machine can do a job, then an automatic calculator can be programmed to simulate the machine. The speeds and memory capacities of present computers may be insufficient to simulate many of the higher functions of the human brain, but the major obstacle is not lack of machine capacity, but our inability to write programs taking full advantage of what we have.

2) How Can a Computer be Programmed to Use a Language

It may be speculated that a large part of human thought consists of manipulating words according to rules of reasoning

# Motivation

- Deep learning - The hottest **AI idea** in town

## Learning From Experience

Deep neural networks learn by adjusting the strengths of their connections to better convey input signals through multiple layers to neurons associated with the right general concepts.

