Welcome to CSE 427 Machine Learning

S M RAFIUDDIN RIFAT

Machine Learning

A Computer program is said to learn from experience E with respect to some class of tasks T and performance P, if its performance at task in T, as measured by P, improves with experience E.

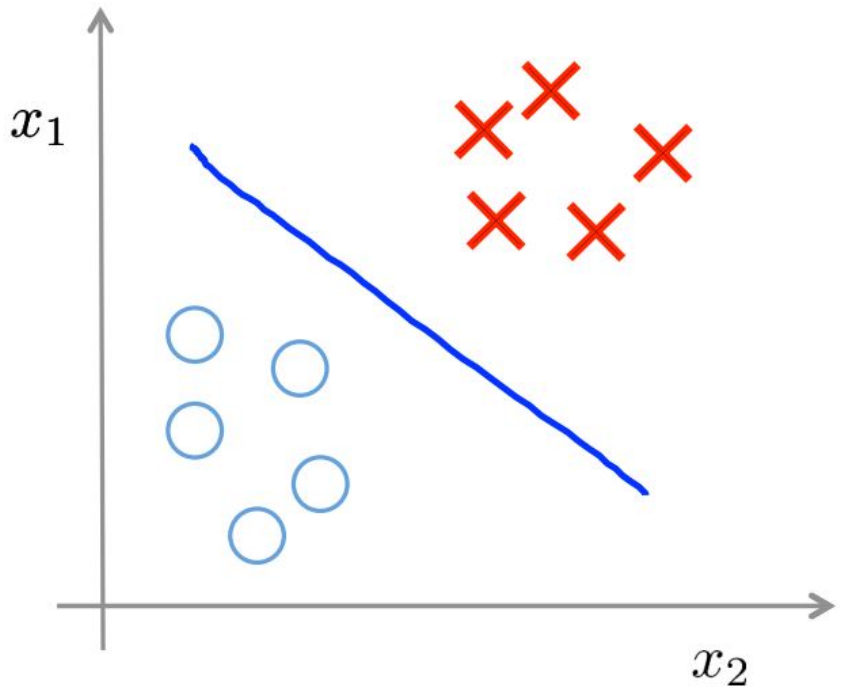
Example of playing checkers—

E = The experience of playing many games of checkers.

T = The task of playing checkers.

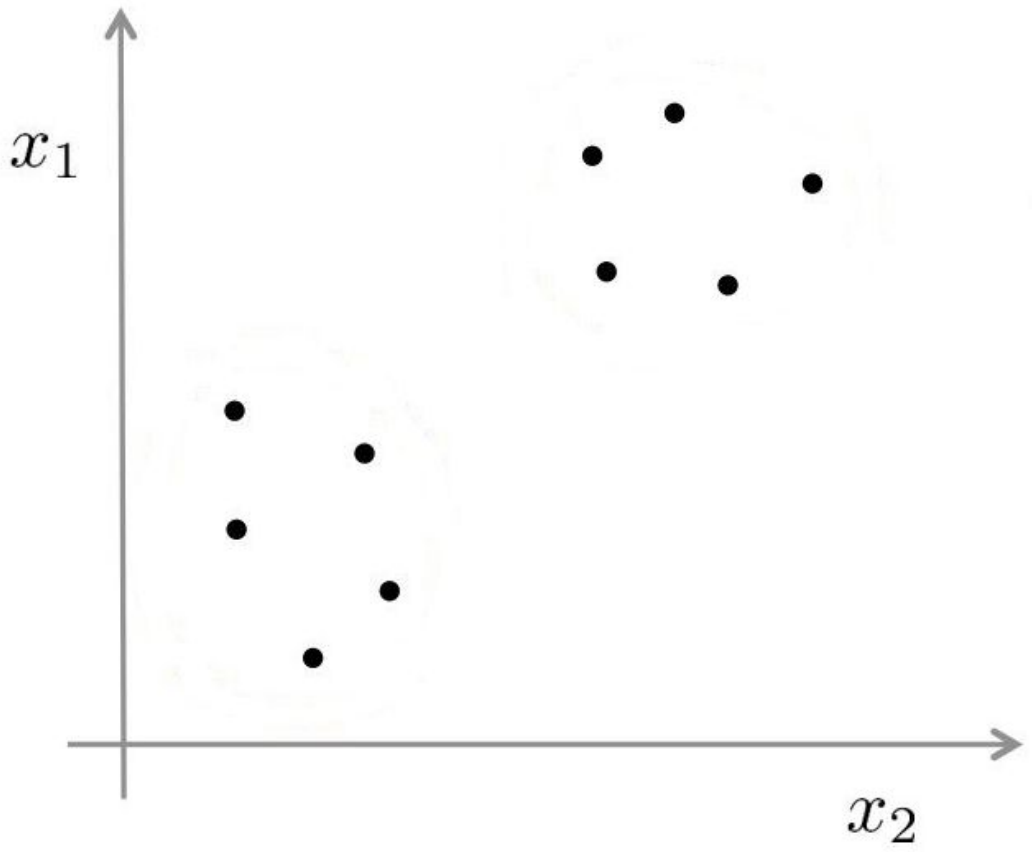
P = The probability that the program will win the next game.

Supervised Learning



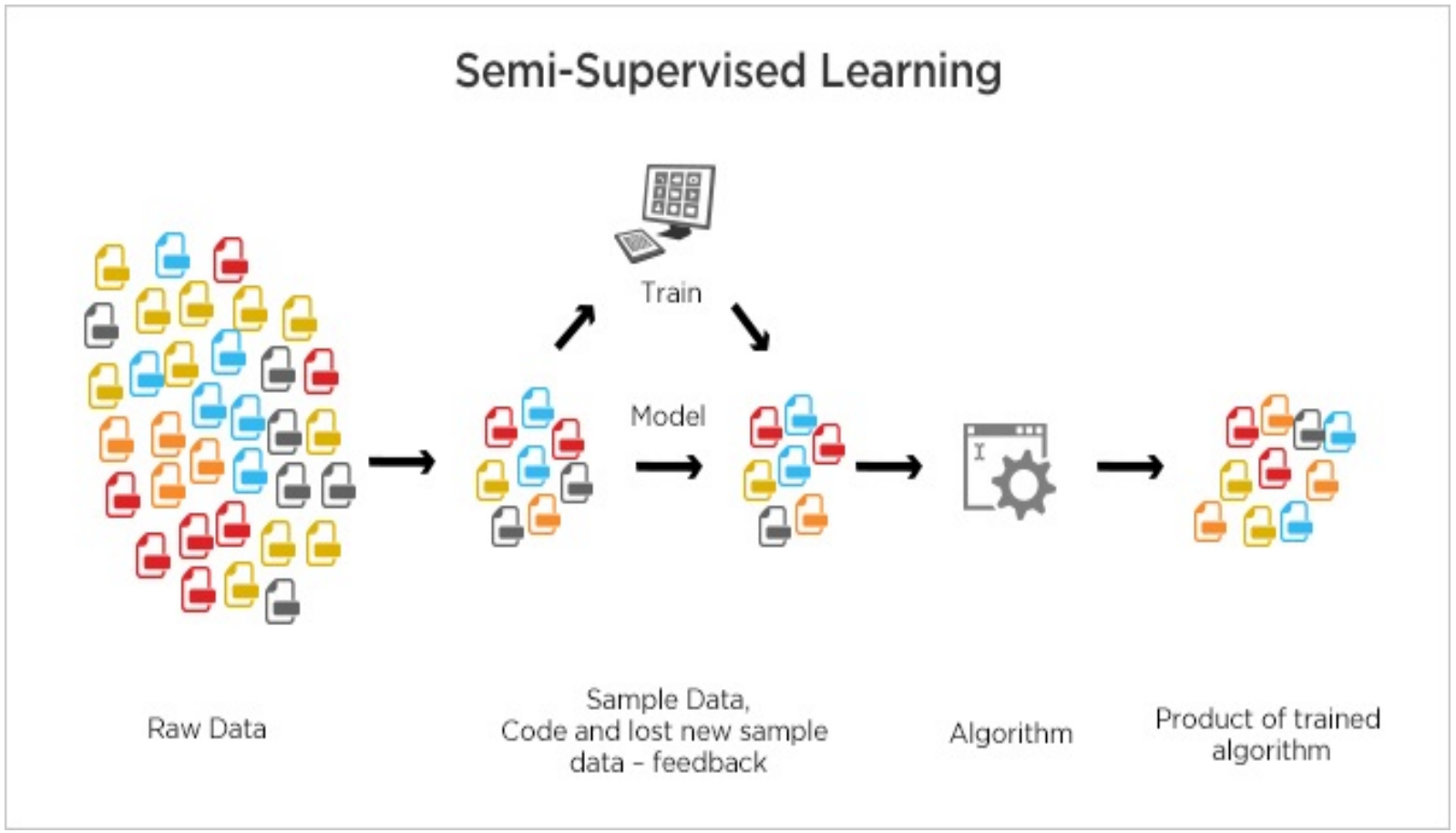
Training set: $\{(x^{(1)}, y^{(1)}), (x^{(2)}, y^{(2)}), (x^{(3)}, y^{(3)}), \ldots, (x^{(m)}, y^{(m)})\}$

Unsupervised Learning

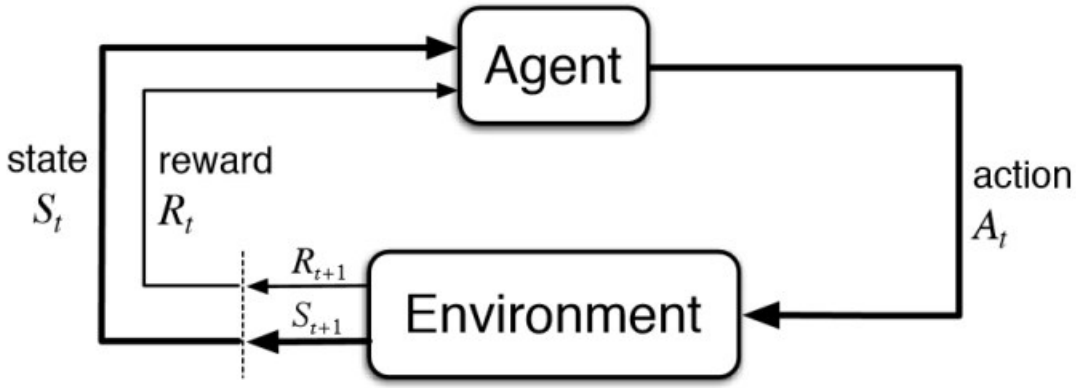


*No labeled data

Semi-supervised Learning



Reinforcement Learning



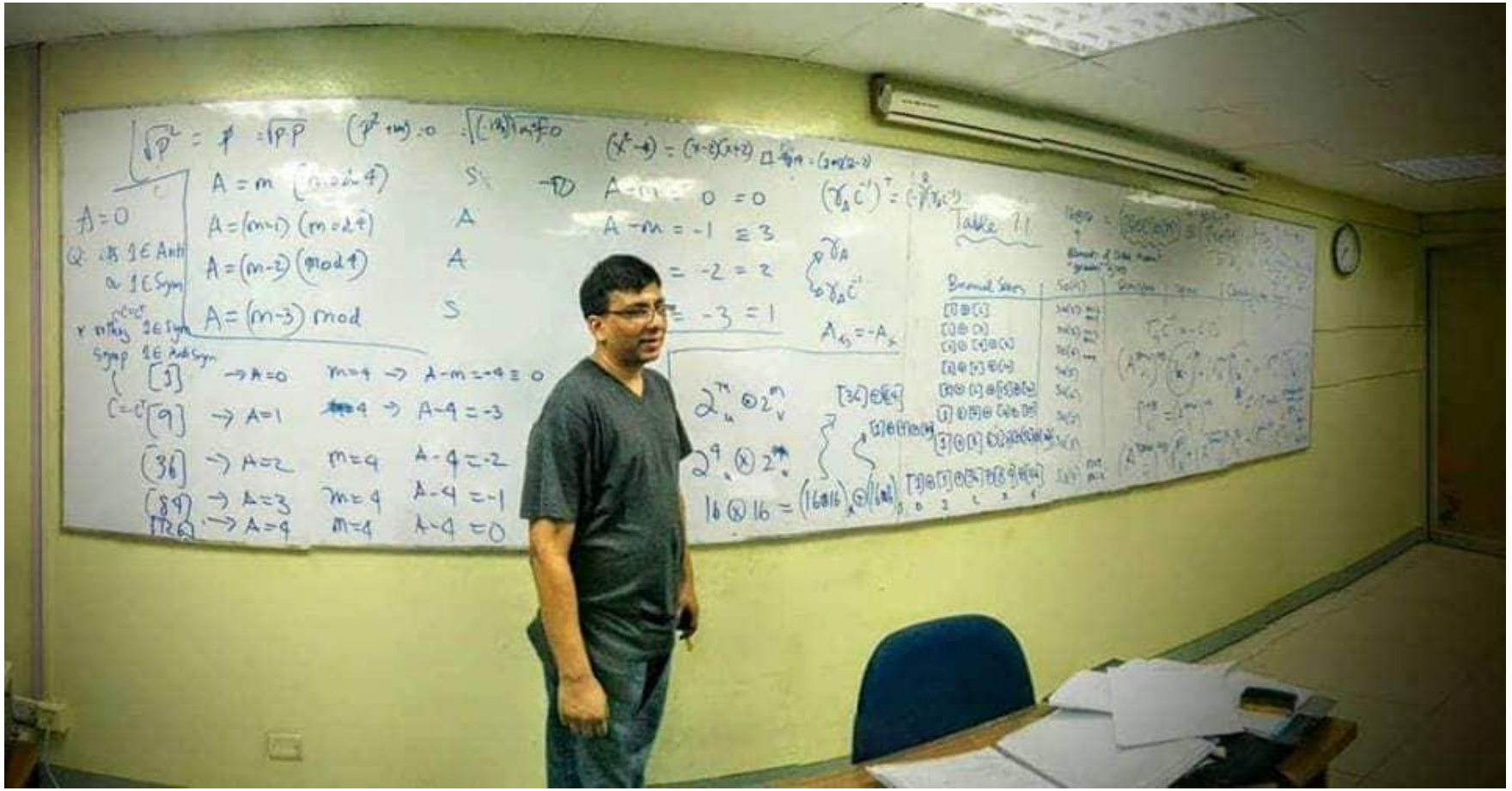
4 Litter Bucket Problem

Just for fun!

Problem:

You have unlimited supply of water. You need to obtain exactly four litter of water (not more or less). But you have two containers. One is 3 litter bucket and another is 5 litter bucket. How could you obtain exactly 4 litters of water using only these two buckets?

Pioneer Computer Scientist from Bangladesh



Dr. Mahbub Majumder

Pioneer Computer Scientist from Bangladesh (Cont'd)

Dr. Ragib Hasan

Pioneer Computer Scientist from Bangladesh (Cont'd)

Dr. Ehsan Haque

Pioneer Computer Scientist from Bangladesh (Cont'd)

Dr. Md. Shamsuzzoha Bayzid

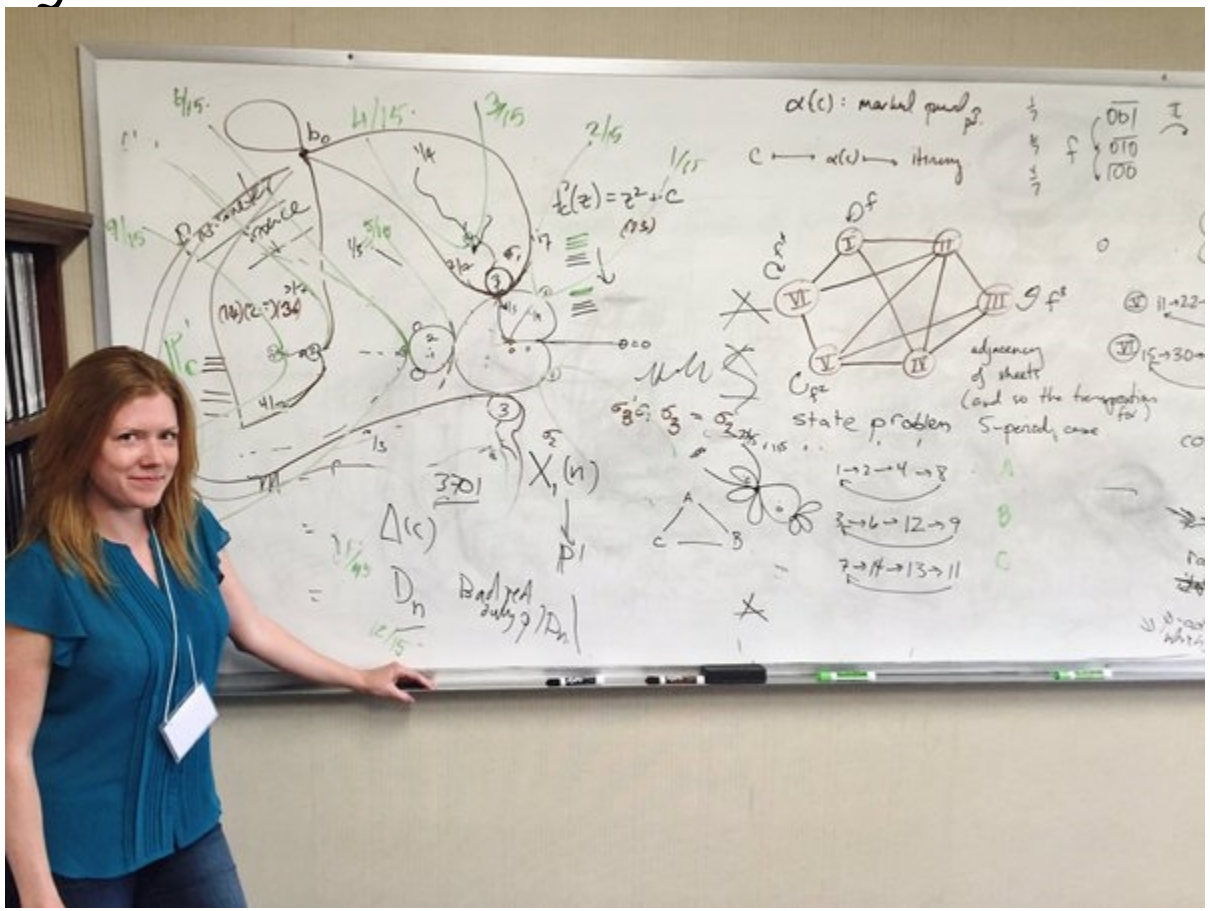
Pioneer Computer Scientist from Bangladesh (Cont'd)

Dr. Nova Ahmed

Some of my Idols

Abdullah al Zubaer Imran
PhD Student, UCLA

Some of my Idols



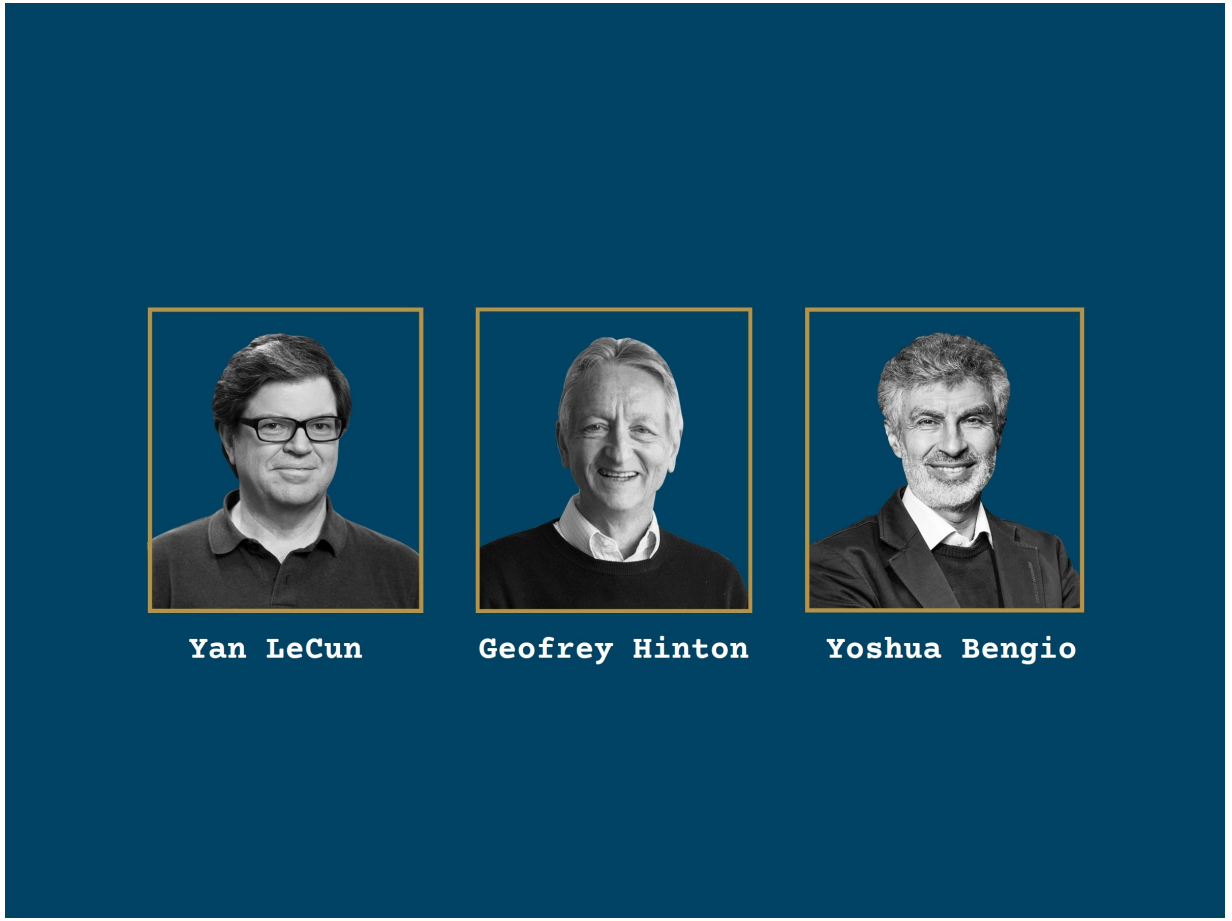
Dr. Holly Kreiger
Mathematician
Lecturer, Cambridge University

Nobel Prize of Computer Science

Alan Mathison Turing

ACM A M TURING AWARD

Turing Award 2018



Definition of Machine Learning

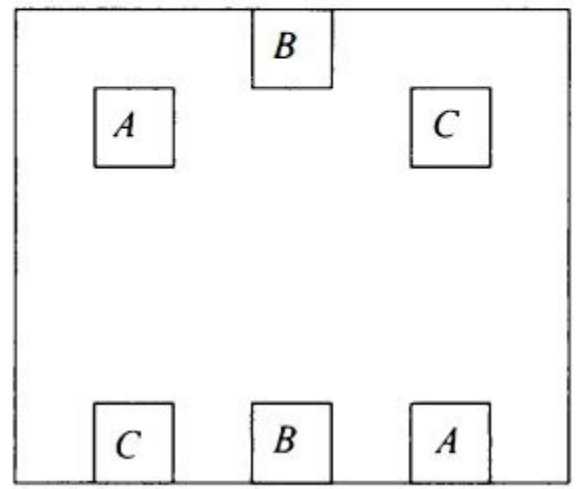
A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E.

Example

Suppose your email program watches which emails you do or do not mark as spam, and based on that learns how to better filter spam. What is the task T in this setting?

- ◯ Classifying emails as spam or not spam.
- ◯ Watching you label emails as spam or not spam.
- ◯ The number (or fraction) of emails correctly classified as spam/not spam.
- ◯ None of the above—this is not a machine learning problem.

Example Consider the following diagram. Can you connect each small box on the top with its same-letter mate on the bottom with paths that do not cross one another, nor leave the boundaries of the large box?



Google Class

- Everyone must join google class.
- All class lectures, notes, announcement, class test marks will be given through Google class.
- Assignment submission may be collected from Google class submission.

Do’s and Don’ts

Do’s

- Try to attend every class and took the lectures on your notebook.
- Ask questions without any hesitation on topics.

Don’ts

- Never talk with your fellow classmates while I’m giving lectures. It is very annoying.
- Never ask one question – “**What will be the questions from this lecture in exams**”?

Evaluation

- Quiz – 15%
- Assignment – 15%
- Midterm – 20%
- Final – 50%

N.B.: Quiz and Assignment marks may vary on situations.

Consultation Hour

Given on Course Outline file.

Find a Research Topic

- Necessity of Standard Dataset.
- Literature Review.
- Try to learn $L_A T_E X$ or try to use it at least.
- Your conception must be clear!
- Try to sketch your imagination.

Reference Books

- Pattern Recognition and Machine Learning – Christopher Bishop.
- Introduction to Machine Learning – Tom Mitchel.
- Youtube – Best source ever!
- Kdnuggets – Blog on Data Science!
- Medium.com – Handful of resources on Pattern Recognition.
- MITOpenCourseWare
- Coursera Machine Learning – Andrew Ng.
- মেশিন লার্নিং অ্যালগরিদম – নাফিস নিহাল!

Thank you!
Hope we'll have a great journey recognizing how a machine learn!