

LECTURE 1

MACHINE LEARNING BASICS

Sung Kim <hunkim+ml@gmail.com>
<http://hunkim.github.io/ml>

Basic Concepts

01. What is ML?

02. What is Learning?

- Supervised
- Unsupervised

03. What is Regression?

04. What is Classification?

Machine Learning

01. Limitations of Explicit Programming

- Spam Filter: Many Rules
- Automatic Driving: Too Many Rules

02. Machine Learning

“Field of study that gives computers the ability to learn without being explicitly programmed” Arthur Samuel (1959)

Supervised/Unsupervised Learning

01. Supervised Learning

- Learning with Labeled Examples - Training Set

Supervised Learning

An Example Training Set for Four Visual Categories.



Supervised/Unsupervised Learning

01. Supervised Learning

- Learning with Labeled Examples

02. Unsupervised Learning : Un-labeled Data

- Google News Grouping
- Word Clustering

Supervised Learning

Most Common Problem Type in ML

- **Image Labeling** : Learning from Tagged Images
- **Email Spam Filter** : Learning from Labeled (Spam or Ham) Email
- **Predicting Exam Score** : Learning from Previous Exam Score and Time Spent

Training Data Set

AlphaGo

Types of Supervised Learning

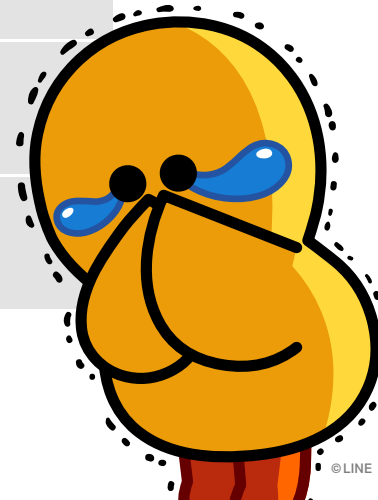
01. Predicting Final Exam Score Based on Time Spent
 - Regression
02. Pass/non-pass Based on Time Spent
 - Binary Classification
03. Letter Grade (A, B, C, D and F) Based on Time Spent
 - Multi-label Classification

Predicting Final Exam Score Based on Time Spent

X (hours)	Y (score)
10	90
9	80
3	50
2	30

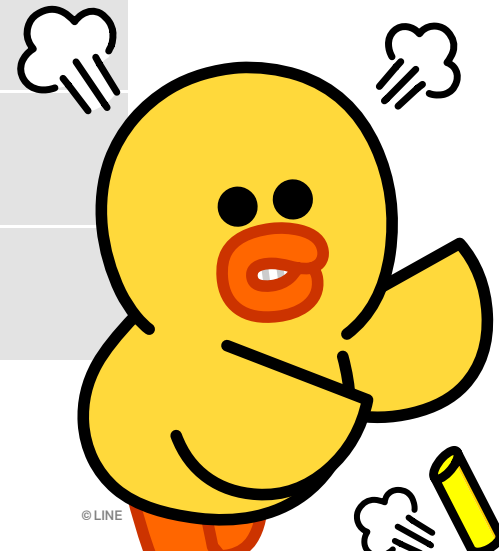
Pass/non-pass Based on Time Spent

X (hours)	Y (pass/fail)
10	P
9	P
3	F
2	F



Letter Grade (A,B,...) Based on Time Spent

X (hours)	Y (grade)
10	A
9	B
3	D
2	F



NEXT LECTURE

LINEAR REGRESSION