# 머신러닝/딥러닝을 위한 Python

## 강의개요

본 강의는 머신러닝, 딥러닝을 배우기 위해 기본적으로 이해해야하는 Python을 다룹니다. 빠른 시간 내에 Python 기초 문법을 복습하고 머신러닝, 딥러닝의 근간을 이루는 Numpy, Pandas와 친숙해지고 싶은 분에게 추천합니다. 참고 - 머신러닝/딥러닝을 위한 Python

## 강의정보

- 강좌명: 머신러닝/딥러닝을 위한 Python
- 강의자명: 가천대학교 산업경영공학과 최성철 교수 (sc82.choi@gachon.ac.kr, Director of TEAMLAB)
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## 강의구성

## Chapter 0 - Environment setup

- 파이썬 설치 - 강의영상
- Atom 설치
  - windows - 강의영상, 설치문서
  - Mac - 강의영상, 설치문서
- Python Ecosystem for Machine Learning - 강의영상

#### Package installation

```
conda create -n ml_python python=3.5
conda install numpy seaborn scikit-learn jupyter
conda install nltk gensim matplotlib
```

## Chapter 1 - Pythonic Code

- Pythonic Code Overview
- Split & Join
- List Comprehension

- Enumerate & Zip
- Map & Reduce
- Asterisk
- Lab: Simple Linear algebra concepts
- Lab: Simple Linear algebra codes
- Assignment: Linear algebra with pythonic code
- Assignment: 연산자 끼워넣기
- Assignment: 톱니바퀴

## Chapter 2 - Numpy section

- Numpy overview
- ndarray
- Handling shape
- Indexing & Slicing
- Creation functions
- Opertaion functions
- Array operations
- Comparisons
- Boolean & fancy Index
- Numpy data i/o
- Assignment: Numpy in a nutshell

## Chapter 3 - Pandas section

- Pandas overview
- Series
- DataFrame
- Selection & Drop
- Dataframe operations
- lambda, map apply
- Pandas builit-in functions
- Lab Assignment: Build a matrix
- Groupby I
- Groupby II
- Casestudy
- Pivot table & Crosstab
- Merg & Concat
- Database connection & Persistance

## Chapter 4 - OOP section

- Objective oriented programming overview
- Objects in Python
- Lab: Note and Notebook
- OOP characteristics
- Decorators, Static And Class Methods
- Abstract Classes

## Chapter 5 - Linear regression

- Linear regression overview
- Cost functions
- Linear Equality
- Gradient descent approach
- Linear regression wtih gradient descent
- Linear regression wtih Numpy
- Multivariate linear regression models
- Multivariate linear regression with NumPy
- - Regularization - L1 and L2
- Implementation of generalization with NumPy
- Linear regression with sklearn

## Chapter 6 - Logistic regression

- Logistic regression overview
- Sigmoid function
- Cost function
- Logistic regression implementation with Numpy
- Maximum Likelihood estimation
- Regularization problems
- Logistic regresion with sklearn
- Softmax fucntion for Multi-class classification
- Cross entropy loss function
- Softmax Logistic Regression
- Performance measures for classification

# References


- K-MOOC: 데이터 과학을 위한 파이썬 입문
- Operation Research with Python Programming