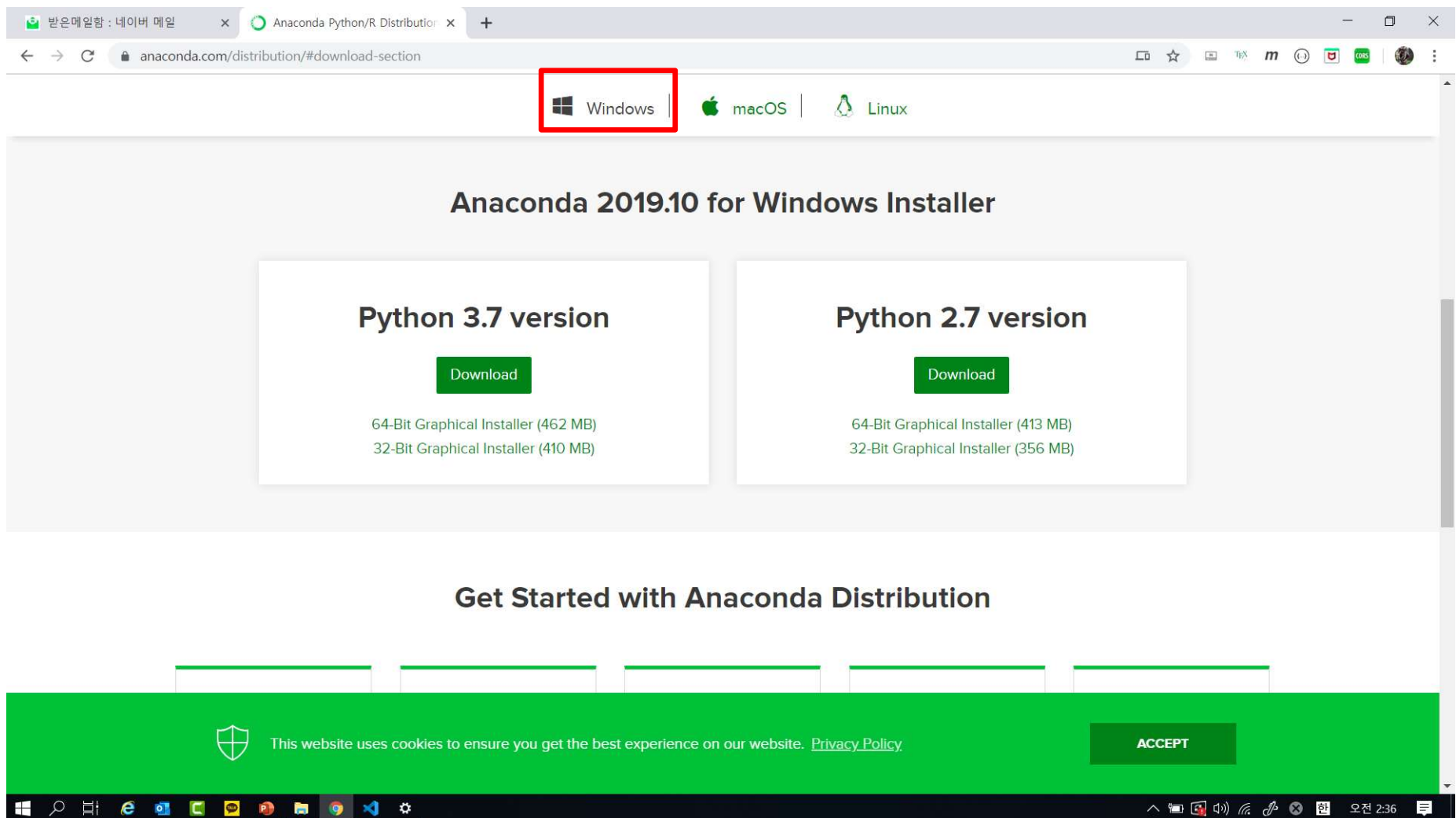


# Python 을 활용한 머신러닝 입문

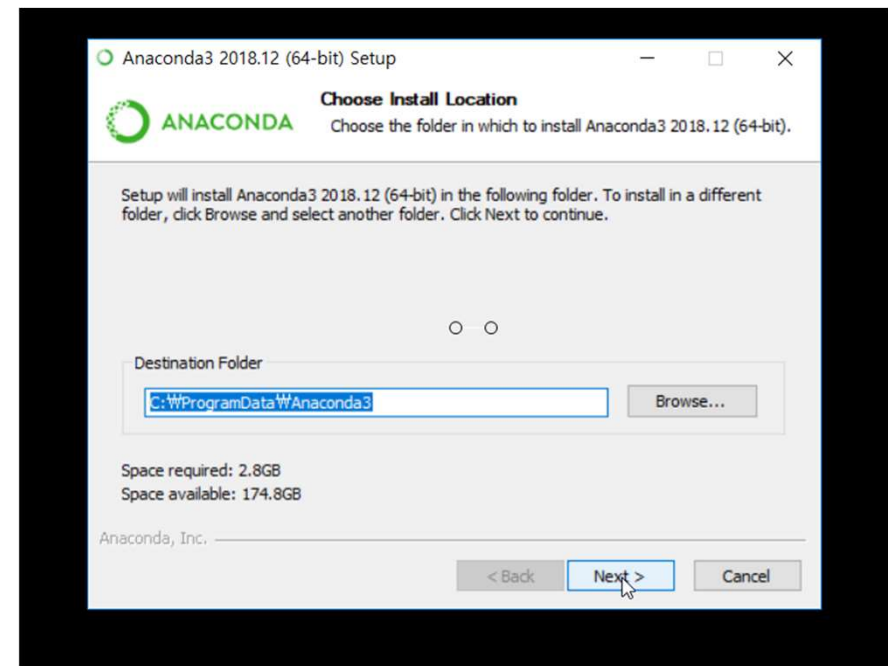
2019. 12

# Anaconda Installation

- <https://www.anaconda.com/distribution/#download-section>



# Anaconda 설치



- 개인별 작업 directory 생성
- 패키지 설치 : `pip install <package name>`
- 설치된 Python package 확인 : `pip list`



```
Anaconda Prompt
(MLwithPython) C:\Users\Recording>python
Python 3.7.1 (default, Dec 10 2018, 22:54:23) [MSC v.1915 64 bit (AMD64)] :: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()

(MLwithPython) C:\Users\Recording>pip freeze
alabaster==0.7.12
anaconda-client==1.7.2
anaconda-navigator==1.9.6
anaconda-project==0.8.2
asn1crypto==0.24.0
astroid==2.1.0
astropy==3.1
atomicwrites==1.2.1
attrs==18.2.0
Babel==2.6.0
backcall==0.1.0
backports.os==0.1.1
backports.shutil-get-terminal-size==1.0.0
beautifulsoup4==4.6.3
bitarray==0.8.3
bkcharts==0.2
blaze==0.11.3
bleach==3.0.2
bokeh==1.0.2
boto==2.49.0
Bottleneck==1.2.1
certifi==2018.11.29
cffi==1.11.5
```

# >jupyter notebook

windows how to restore virtual x Desktop/

localhost:8888/tree/Desktop

NAVER Online Photo Edito... Beginning JavaScri... The Coding Train -... Problem Solving w... OYJ GITHUB Eloquent JavaScript Personal apps | He... https://oyj-static-te... Untitled document...

jupyter Quit Logout

Files Running Clusters

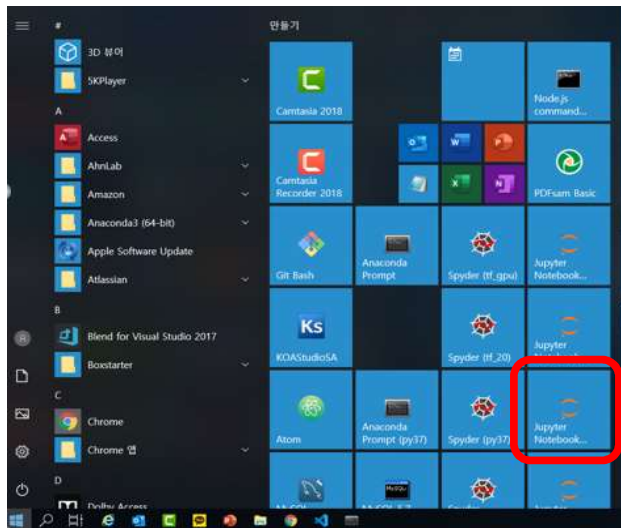
Select items to perform actions on them.

Upload New

0 / Desktop

	Name	Last Modified	File size
<input type="checkbox"/>	..	몇 초 전	
<input type="checkbox"/>	Advanced Machine Learning-Coursera	6일 전	
<input type="checkbox"/>	Algorithm JavaScript	하루 전	
<input type="checkbox"/>	Algorithm Python	2일 전	
<input type="checkbox"/>	backtrader	4달 전	
<input type="checkbox"/>	CodingChallenge	2달 전	
<input type="checkbox"/>	Coursera IoT	3달 전	
<input type="checkbox"/>	Coursera ML-Finance	6달 전	
<input type="checkbox"/>	coursera-algorithmic-python	21일 전	
<input type="checkbox"/>	DataScienceClub	6일 전	
<input type="checkbox"/>	Derivatives Analytics	9달 전	
<input type="checkbox"/>	Finance for Python	일 년 전	
<input type="checkbox"/>	GAN Udemey	20일 전	

Windows taskbar: 3:58 PM, 2019-03-26



Anaconda 로 설치한 경우 시작 icon 자동 생성

명령 prompt > jupyter notebook

```
(py37) C:\Users\trimu>jupyter notebook
[I 09:19:03.913 NotebookApp] JupyterLab extension loaded from C:\Users\trimu\Miniconda3\envs\py37\lib\site-packages\jupyterlab
[I 09:19:03.913 NotebookApp] JupyterLab application directory is C:\Users\trimu\Miniconda3\envs\py37\share\jupyter\lab
[I 09:19:03.915 NotebookApp] Serving notebooks from local directory: C:\Users\trimu
[I 09:19:03.916 NotebookApp] The Jupyter Notebook is running at:
[I 09:19:03.916 NotebookApp] http://localhost:8888/?token=cde0891905a6a5459965881382c153b4f9f5593f1cab1221
[I 09:19:03.916 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 09:19:04.085 NotebookApp]
```

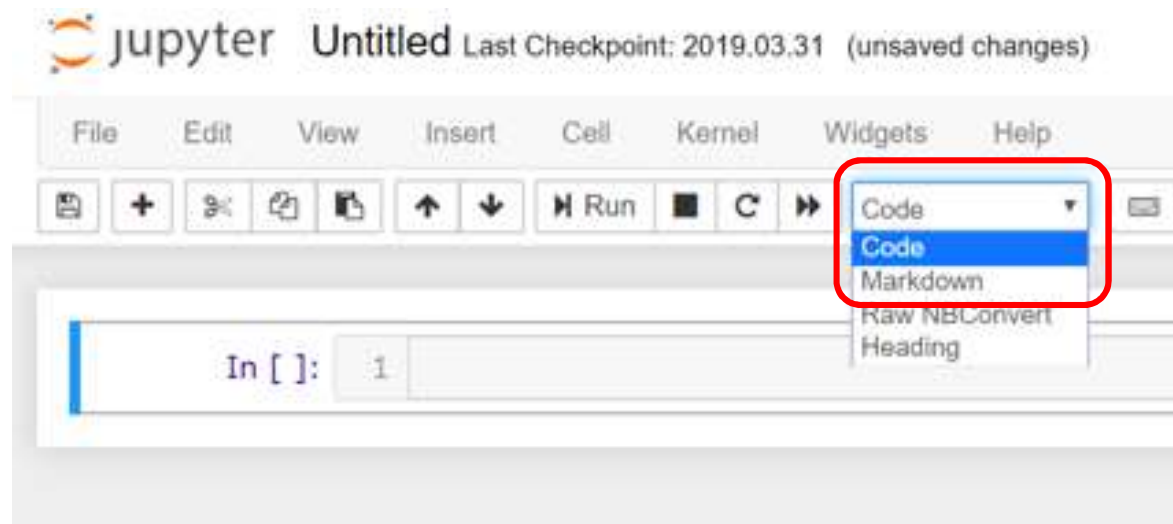
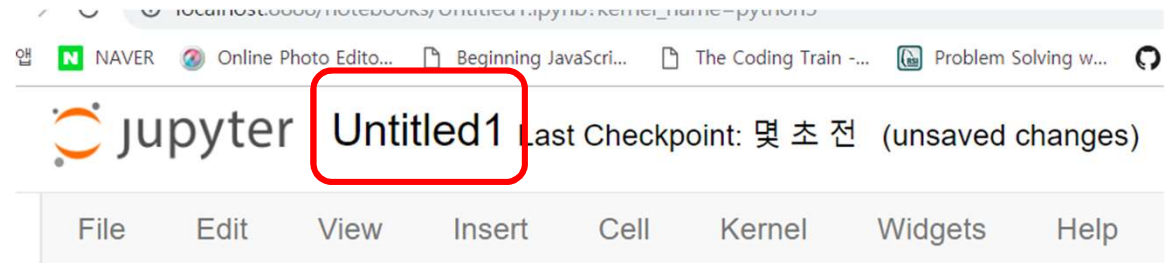
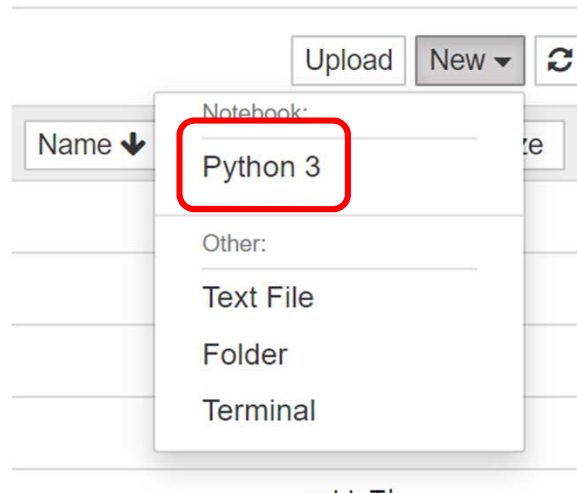
To access the notebook, open this file in a browser:  
 file:///C:/Users/trimu/AppData/Roaming/jupyter/runtime/nbserver-27684-open.html  
 Or copy and paste one of these URLs:  
<http://localhost:8888/?token=cde0891905a6a5459965881382c153b4f9f5593f1cab1221>

```
C:\Users\whoami>jupyter notebook list
```

```
Currently running servers:
```

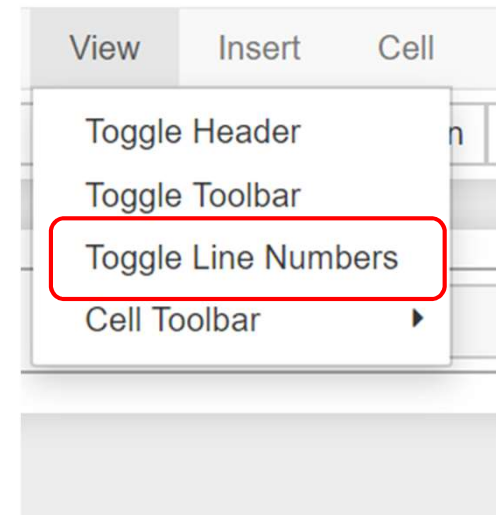
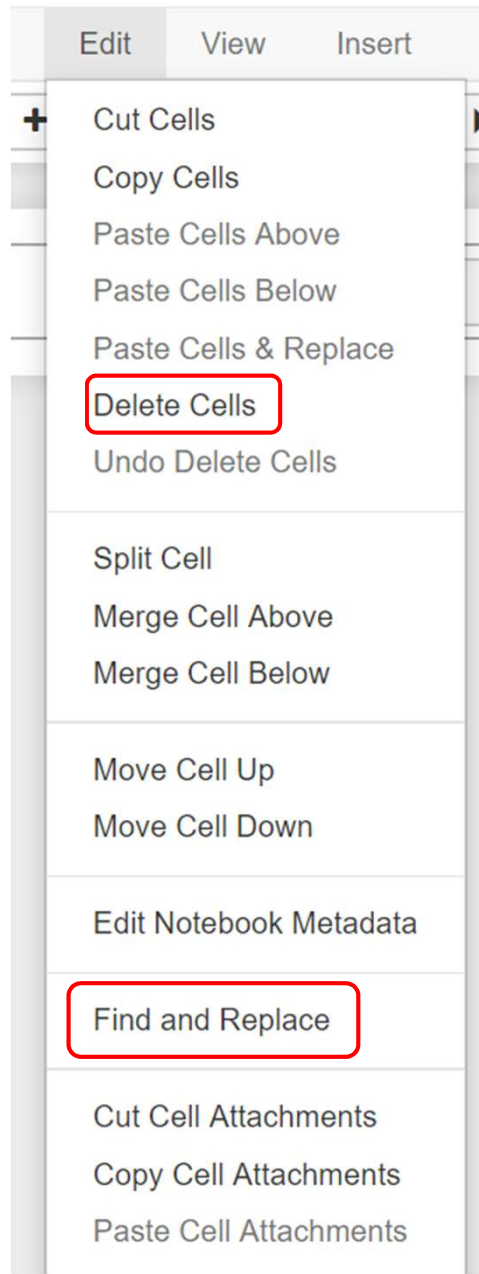
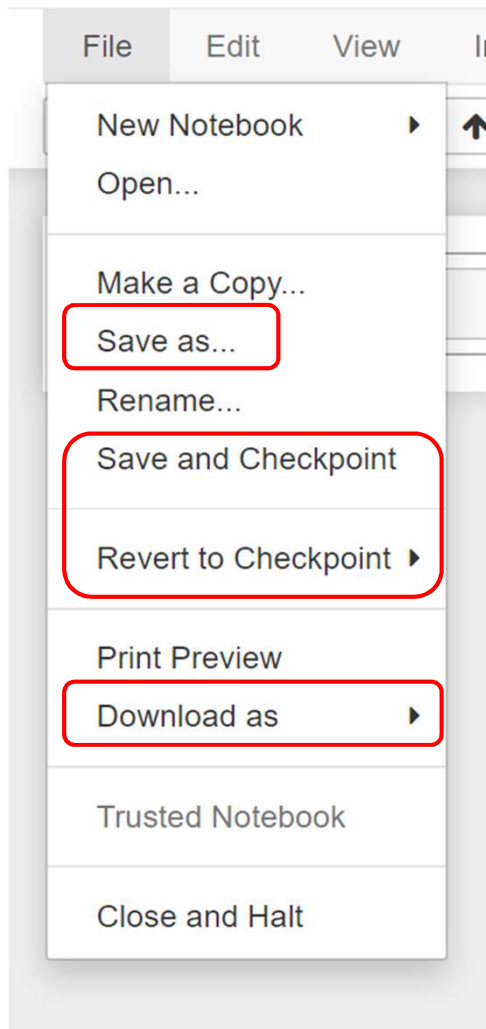
```
http://localhost:8888/?token=9381e1ec86f4ace207780ac683ab440fde7d7a4ecf65af0c ::
```

# Jupyter Notebook 사용방법

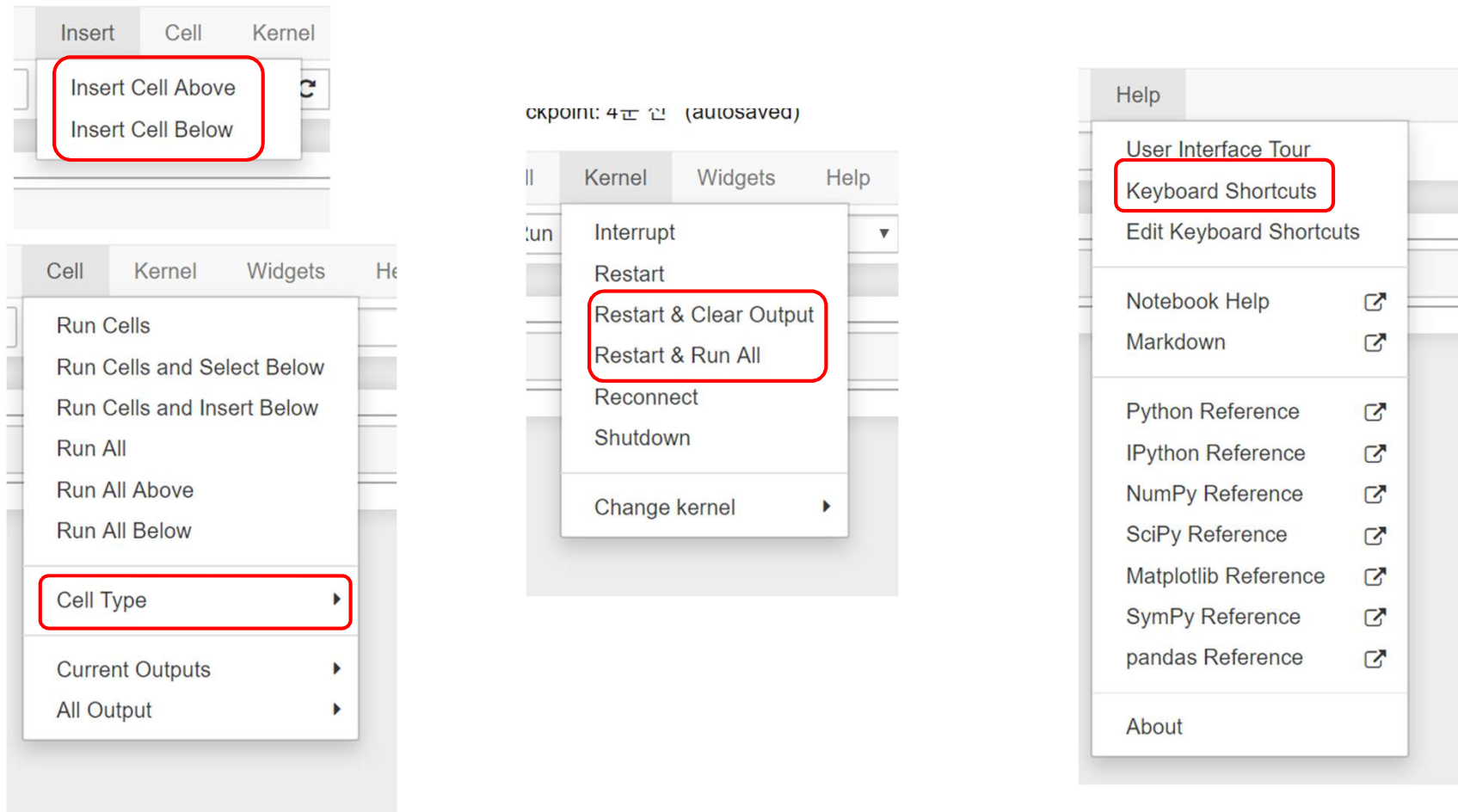




# Jupyter Notebook 사용방법



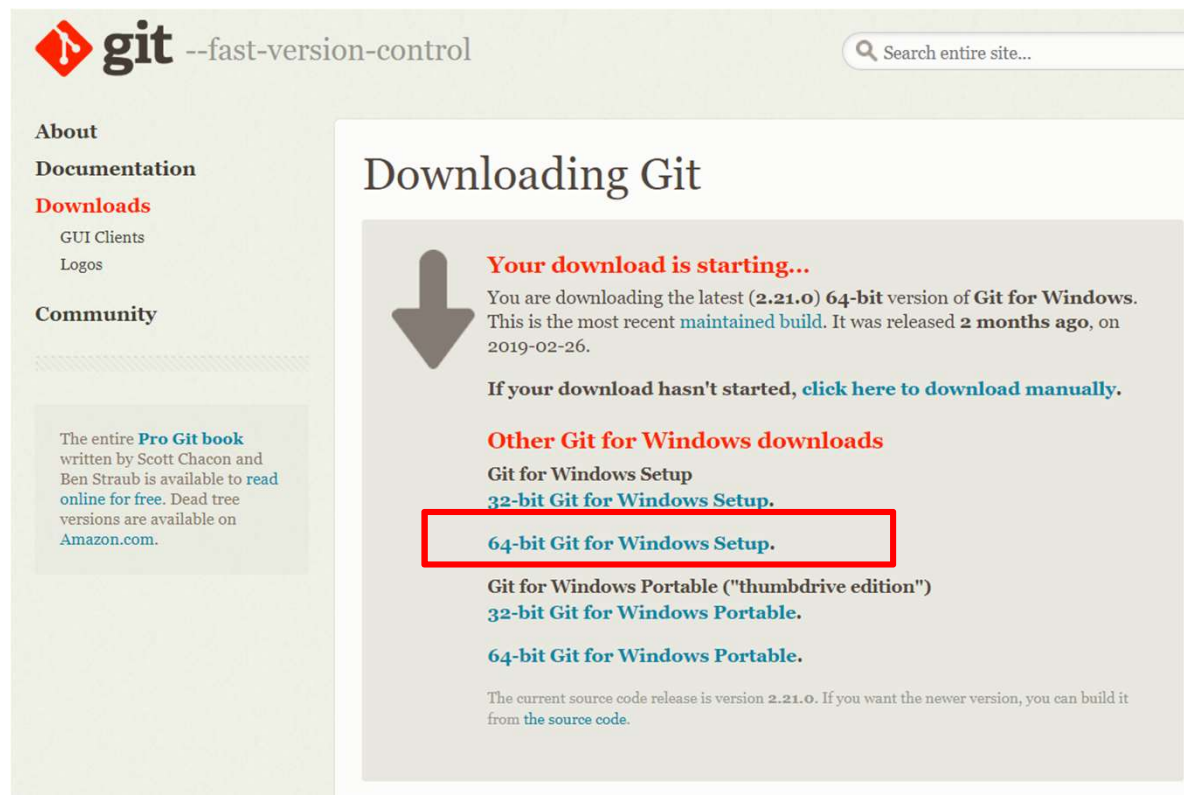
# Jupyter Notebook 사용방법



\* Login 비밀번호 요구할 경우 사용자 계정의 ~/.jupyter/jupyter\_notebook\_config.py 삭제

# git Installation

<https://git-scm.com/download/win>



The screenshot shows the Git website's download page for Windows. The page has a light green header with the Git logo and tagline "--fast-version-control". A search bar is in the top right. The left sidebar contains links for "About", "Documentation", "Downloads" (highlighted in red), "GUI Clients", "Logos", and "Community". Below these is a box about the "Pro Git book". The main content area is titled "Downloading Git" and features a large downward arrow. It states that the latest (2.21.0) 64-bit version of Git for Windows is being downloaded, which is the most recent maintained build released 2 months ago on 2019-02-26. It provides a link to download manually if the automatic download hasn't started. Under "Other Git for Windows downloads", it lists "Git for Windows Setup", "32-bit Git for Windows Setup.", and "64-bit Git for Windows Setup." (which is highlighted with a red box). It also lists "Git for Windows Portable ('thumbdrive edition')", "32-bit Git for Windows Portable.", and "64-bit Git for Windows Portable.". At the bottom, it mentions the current source code release is version 2.21.0 and provides a link to the source code.

**git** --fast-version-control

Search entire site...

**About**  
**Documentation**  
**Downloads**  
GUI Clients  
Logos  
**Community**

The entire **Pro Git book** written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

## Downloading Git

**Your download is starting...**

You are downloading the latest (**2.21.0**) **64-bit** version of **Git for Windows**. This is the most recent [maintained build](#). It was released **2 months ago**, on 2019-02-26.

If your download hasn't started, [click here to download manually](#).

### Other Git for Windows downloads

Git for Windows Setup  
[32-bit Git for Windows Setup.](#)  
**[64-bit Git for Windows Setup.](#)**

Git for Windows Portable ("thumbdrive edition")  
[32-bit Git for Windows Portable.](#)  
[64-bit Git for Windows Portable.](#)

The current source code release is version **2.21.0**. If you want the newer version, you can build it from [the source code](#).

# Github Repository

<https://github.com/ironmanciti/machineLearningBasic>

ironmanciti / machineLearningBasic

Watch 0

Star 0

Fork 0

<> Code

Issues 0

Pull requests 0

Projects 0

Wiki

Insights

Settings

파이썬을 활용한 머신러닝 입문 과정

Edit

Manage topics

1 commit

1 branch

0 releases

1 contributor

Branch: master

New pull request

Create new file

Upload files

Find File

Clone or download

ironmanciti Initial commit

README.md Initial commit

README.md

machineLearningBasic

파이썬을 활용한 머신러닝 입문 과정

Clone with HTTPS ? Use SSH

Use Git or checkout with SVN using the web URL.

https://github.com/ironmanciti/machineLe

Open in Desktop

Download ZIP

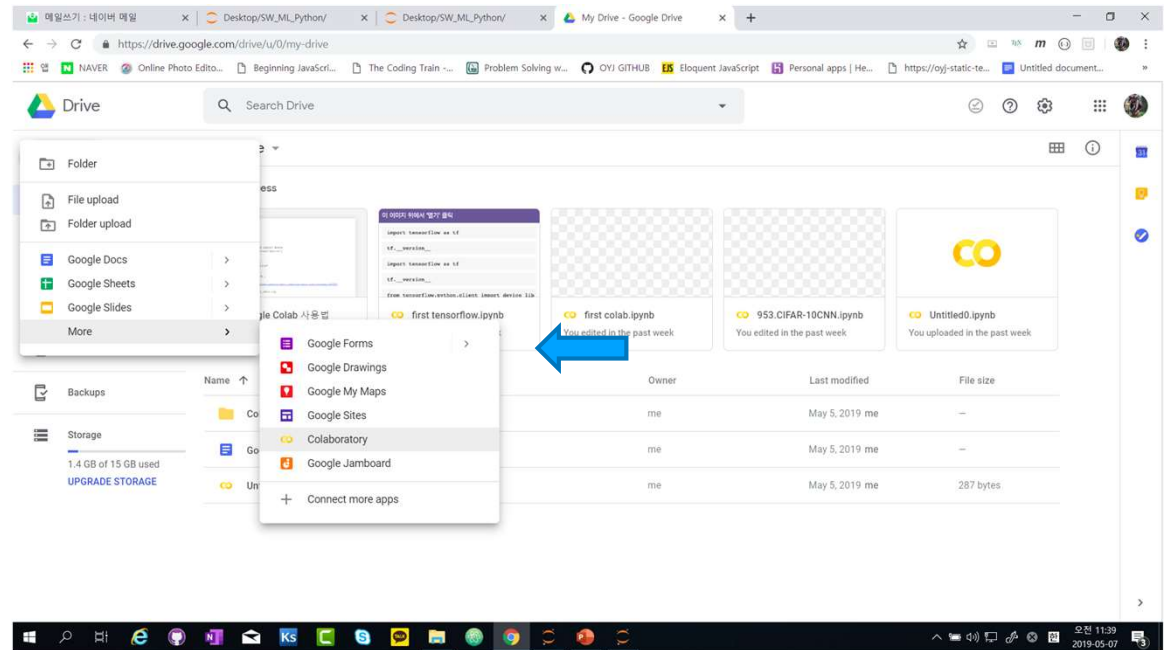
# Google Colaboratory

- Free GPU 제공
- Google Drive 와 연동
- Jupyter Notebook 환경
- Deep Learning beginner 를 위한 최적의 환경
- 각종 snippet 제공

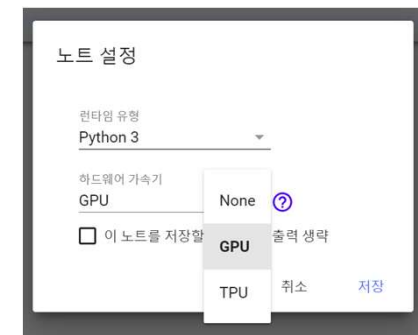
# Google Colaboratory 사용하기

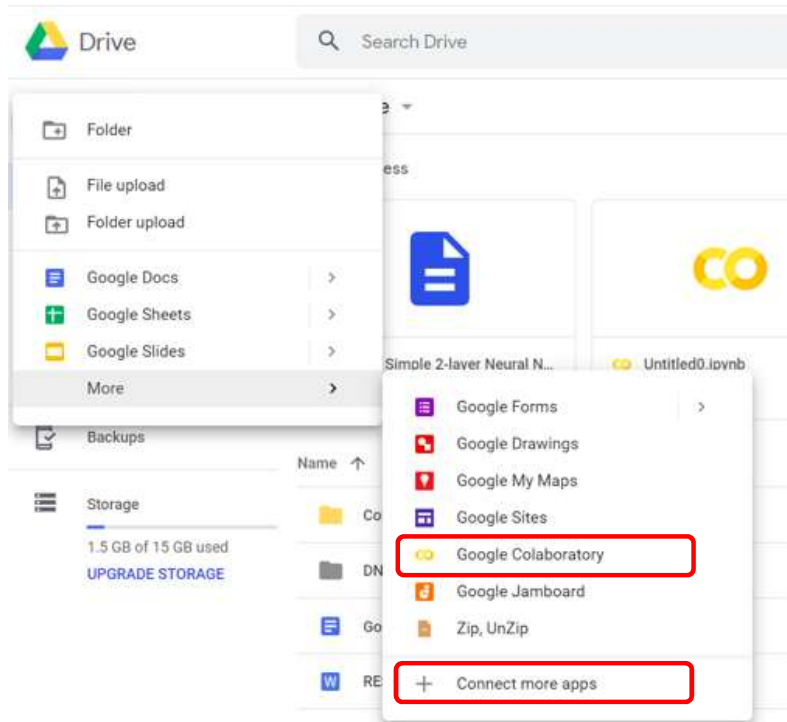
- Google drive

➔ Colaboratory 연결



- 런타임 → 런타임 유형변경 → GPU 선택





보이지 않을 경우 Colab 추가

- gpu check

```
[1] from tensorflow.python.client import device_lib
    device_lib.list_local_devices()
```

➞ The default version of TensorFlow in Colab will soon switch to TensorFlow 2.x.  
We recommend you [upgrade](#) now or ensure your notebook will continue to use TensorFlow 1.x via the `%tensorflow_version 1.x` magic: [more info](#).

```
[name: "/device:CPU:0"
 device_type: "CPU"
 memory_limit: 268435456
 locality {
 }
```

```
incarnation: 11925876377786261971, name: "/device:XLA_CPU:0"
 device_type: "XLA_CPU"
 memory_limit: 17179869184
 locality {
 }
 incarnation: 5168198067976361036
 physical_device_desc: "device: XLA_CPU device"]
```

**CPU**

```
incarnation: 1135439848827926988
 physical_device_desc: "device: XLA_GPU device", name: "/device:GPU:0"
 device_type: "GPU"
 memory_limit: 11330115994
 locality {
   bus_id: 1
   links {
   }
 }
 incarnation: 18206703667281236574
 physical_device_desc: "device: 0, name: Tesla K80, pci bus id: 0000:00:04.0, compute capability: 3.7"]
```

**GPU**



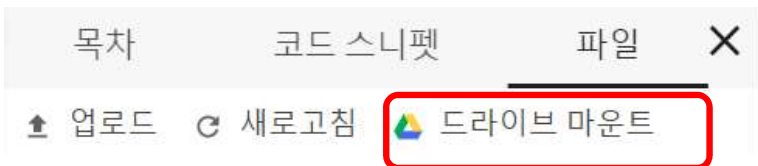
- Google Drive & Colab 연결

## 1) from google.colab import auth

```
from google.colab import drive
drive.mount('/gdrive')
%cd /gdrive
```

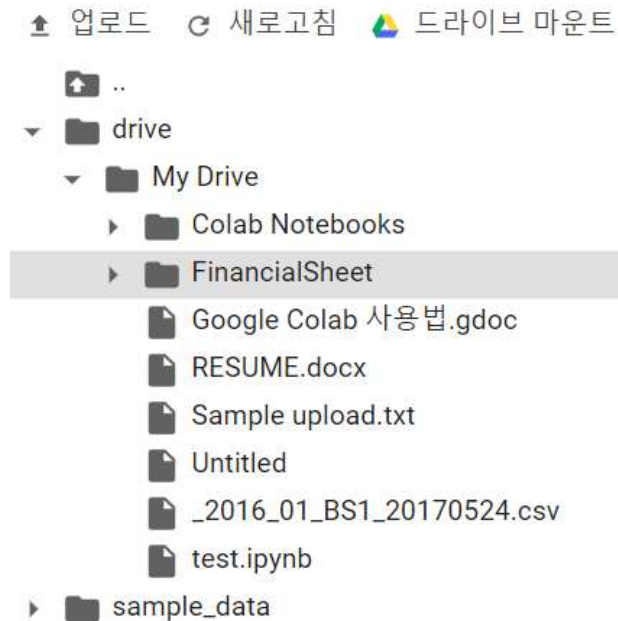
Go to this URL in a browser: [https://accounts.google.com/o/oauth2/auth?client\\_id=947318989803-6bn6qk8qdgf4n4g3pfee6491hc](https://accounts.google.com/o/oauth2/auth?client_id=947318989803-6bn6qk8qdgf4n4g3pfee6491hc)

Enter your authorization code:



```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

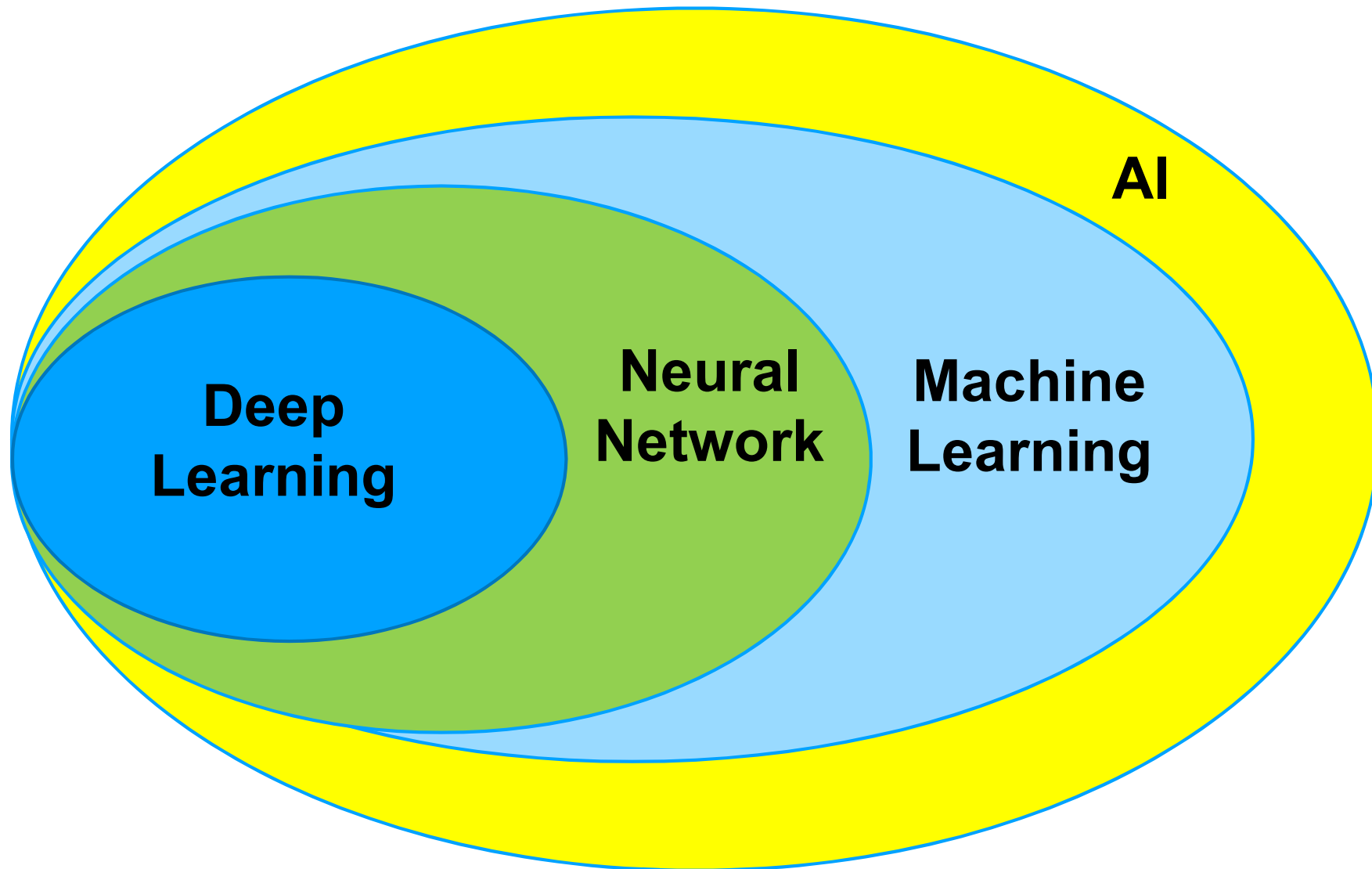


## 2) Read csv file

```
[8] import pandas as pd
pd.read_csv("/content/gdrive/My Drive/FinancialSheet/2015_4Q_FS/_2015_04_CF2_20160601.csv")
```

# Machine Learning 개요

# AI vs Machine Learning vs Deep Learning



# History of Machine Learning

- **탄생 [1950년대]**

1958년 코넬대 심리학자 프랭크 로센블라트가 인간의 뇌신경을 본떠 Perceptron 고안. 신경망 기반 인공지능 연구의 부흥기 시작

- **AI의 첫번째 암흑기 [1970년대]**

Marvin Minsky가 Perceptron은 XOR 문제를 해결할 수 없음을 수학적으로 증명. 인공지능에 대한 대규모 연구 지원 중단

- **중흥기 [1980년대]**

산업계에 전문가 시스템(Expert System)이 도입되며 본격적으로 확산

- **AI 의 두번째 암흑기 [1987 – 1993]**

투자대비 효용성의 한계가 노출. 슈퍼컴퓨터와 시뮬레이션 분야로 연구방향을 전환

\* Jeffery Hinton (Toronto 대학) back-propagation algorithm 개발  
→ 민스키가 틀렸다는 것을 증명

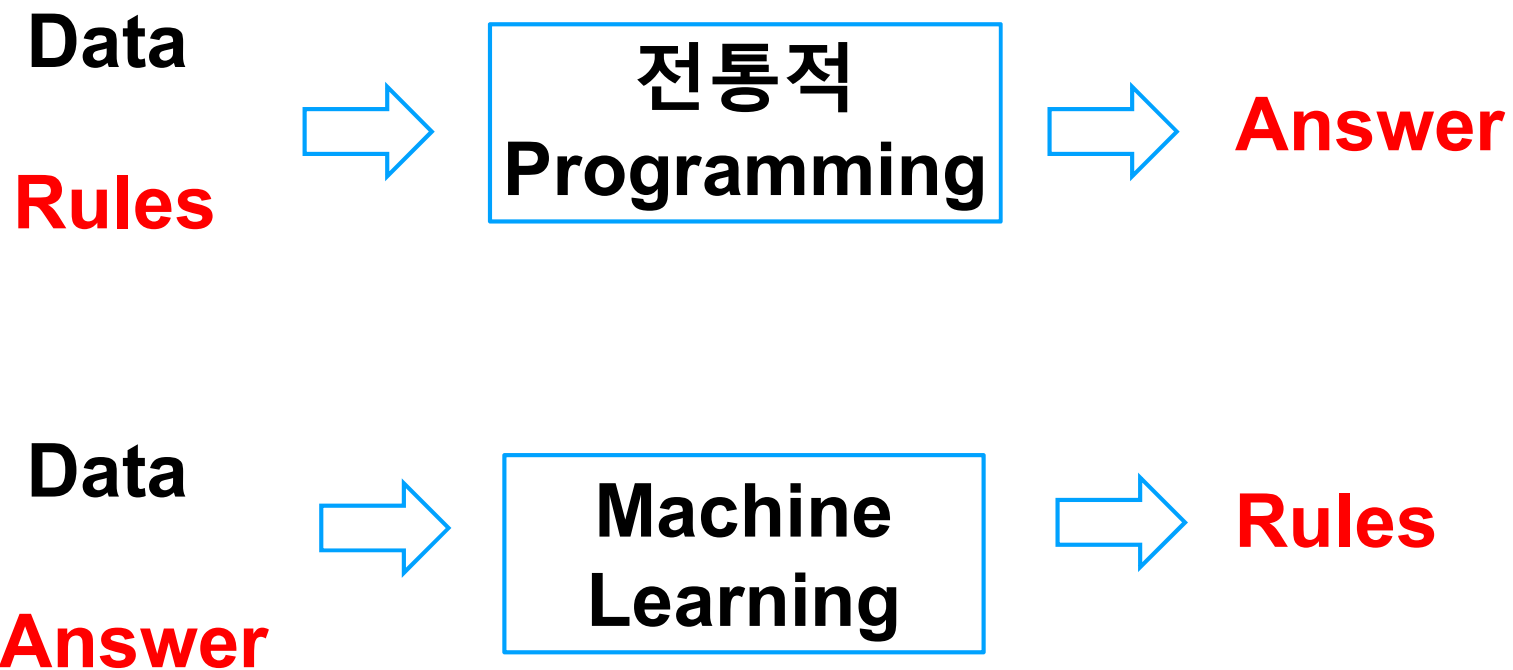
- **IBM Deep Blue 가 Garry Kasparov 에 승리 - 1996**

- **Google Brain 이 최초로 인간 얼굴 인식 - 2012**

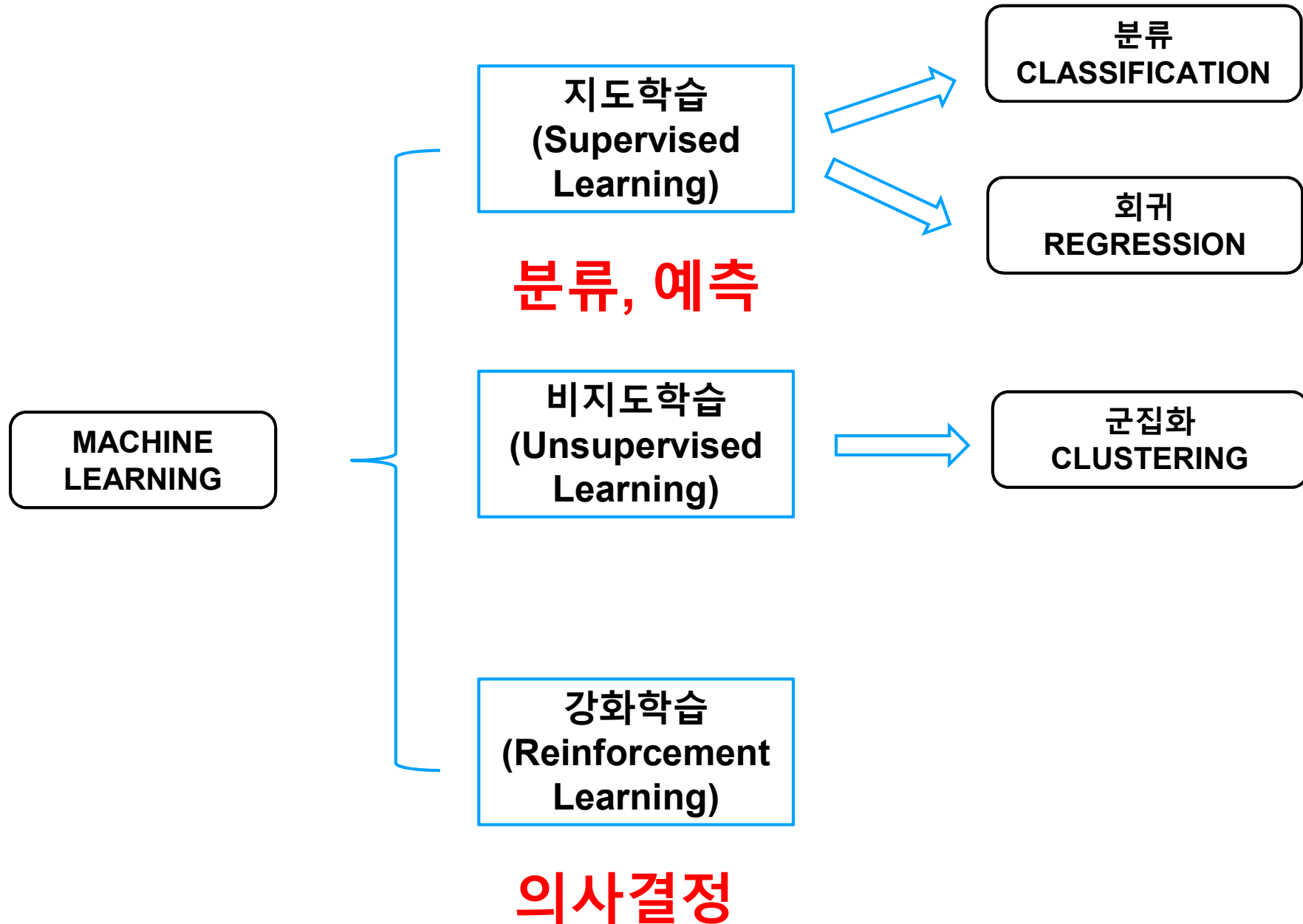
- **~ 상업적 대 폭발기**

- **AlphaGo 이세돌에 승리 – 2016**

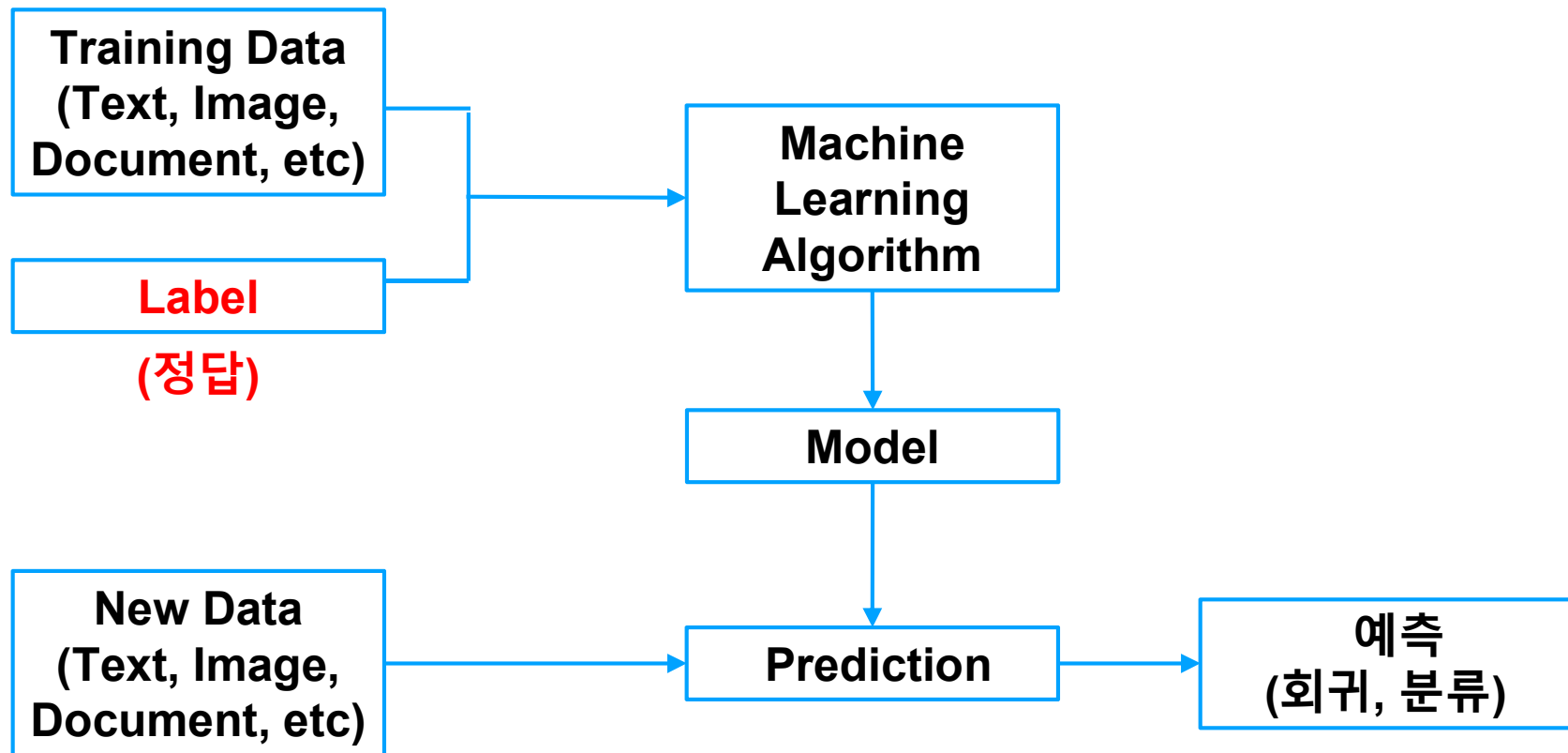
# 전통적 Programming VS Machine Learning



# Machine Learning 의 종류

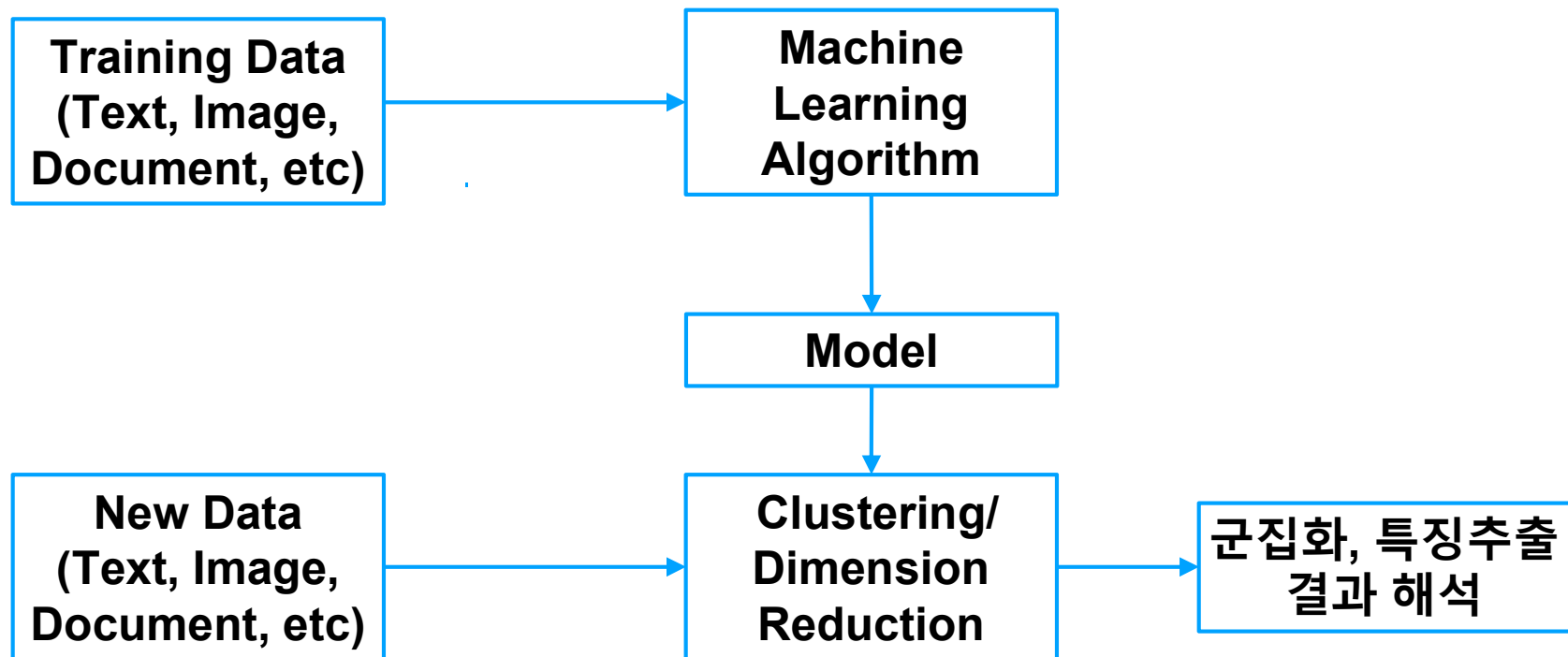


# Supervised Learning (지도학습)

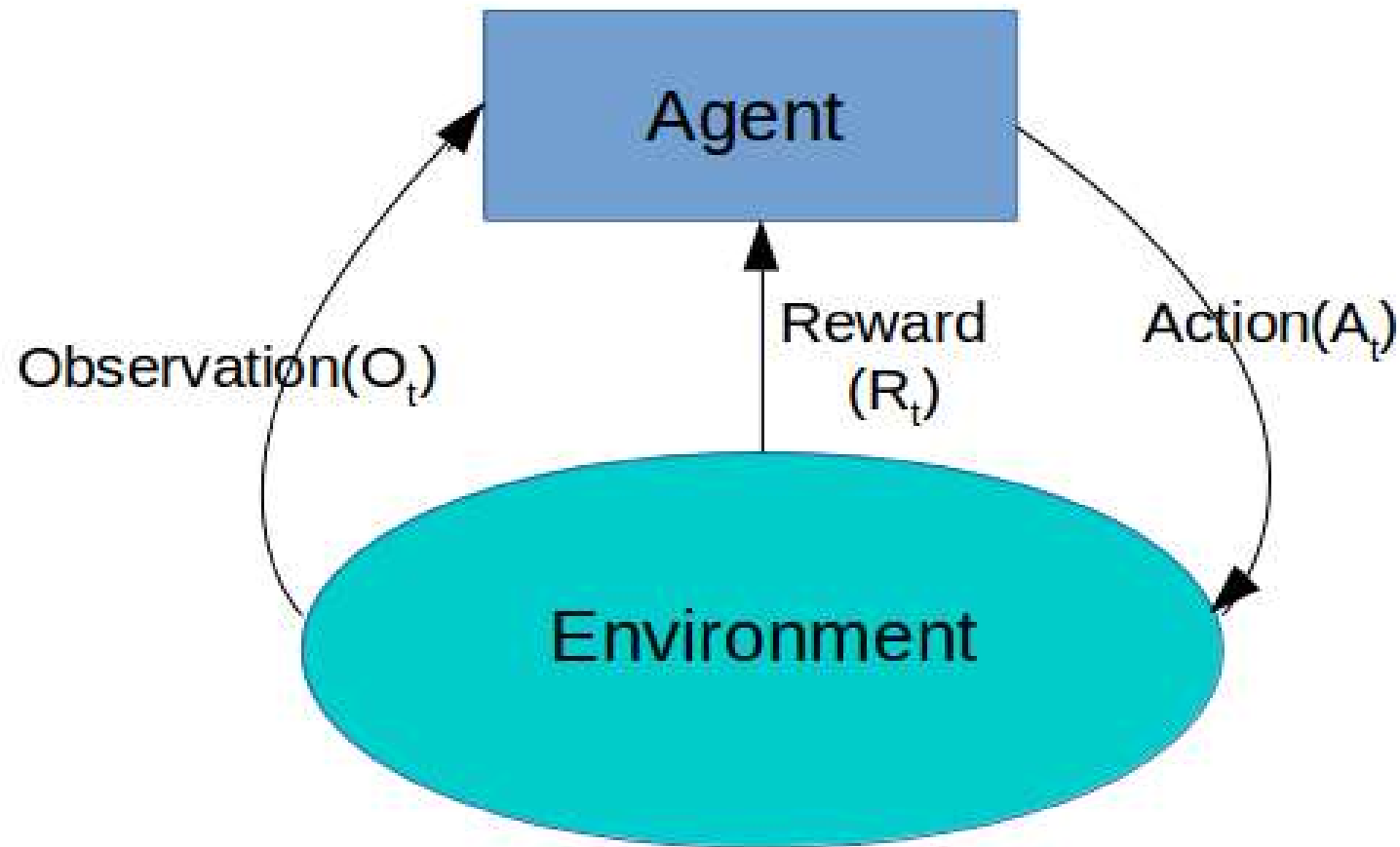




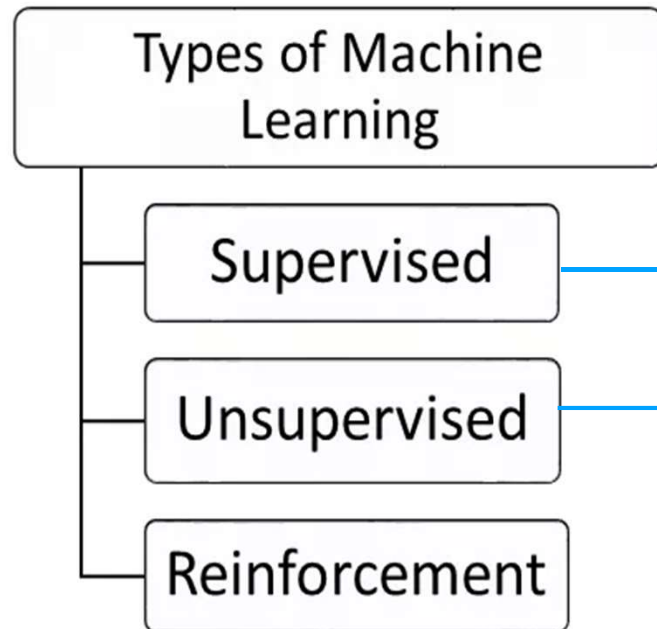
# Unsupervised Learning (비지도학습)



# Reinforcement Learning (강화학습)



# Machine Learning 기법의 종류



전통적 ML	<ul style="list-style-type: none"><li>• Linear &amp; Logistic Regression</li><li>• KNN</li><li>• Decision Tree</li><li>• SVM</li><li>• Ensembles</li><li>• K-Means Clustering</li><li>• PCA</li></ul>
Deep Learning (Neural Network)	<p>FC</p> <p>CNN</p> <p>RNN</p> <p>Auto Encoder</p> <p>GAN</p>

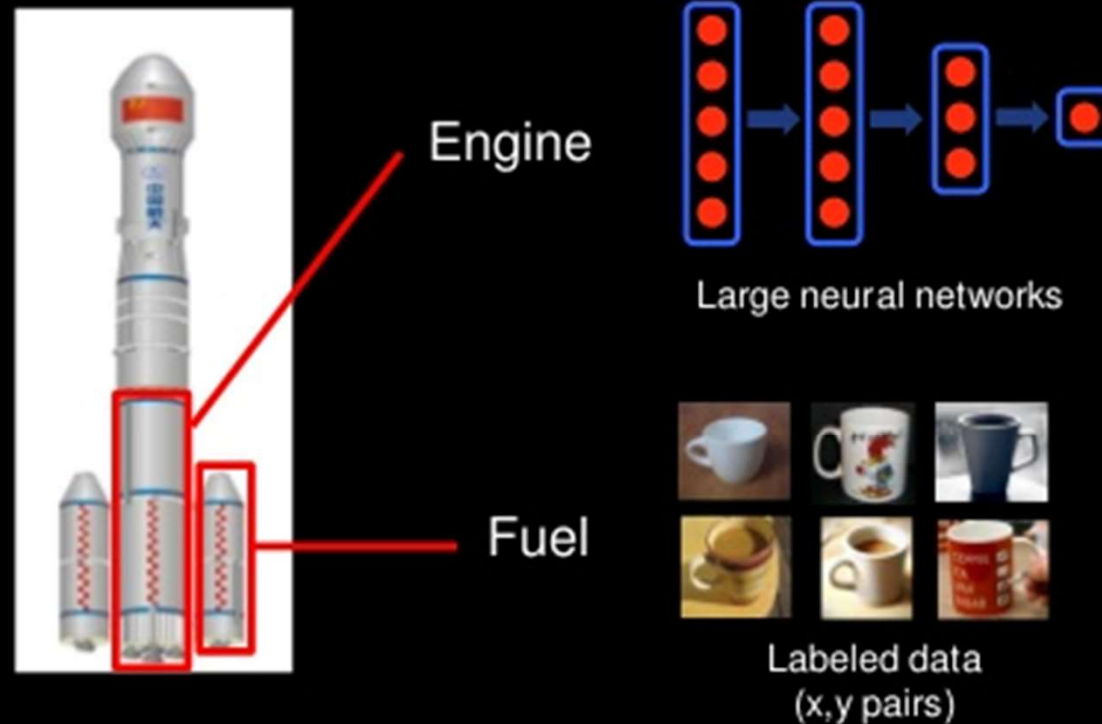
# 전통적 ML의 기법

종류	용도
Linear / Logistic Regression	선형회귀/분류
KNN (K-Nearest Neighbor)	분류/회귀
Decision Tree (결정나무)	분류
SVM (Support Vector Machine)	분류, 회귀
Ensemble (Random Forest, XGBoost, etc)	분류, 회귀
K-Means Clustering (K-평균 군집화)	군집화
PCA (Principal Component Analysis)	차원 축소

# Neural Network 의 종류

종류	용도
FC (Fully Connected Neural Network)	분류, 회귀
CNN (Convolutional Neural Network)	Image 인식
RNN (Recurrent Neural Network)	시계열 인식, 자동번역, 감성분석 등
AE (Auto Encoder)	비지도 학습, 차원축소
GAN (Generative Adversarial Nets)	적대적 생성모델, 이미지 위조

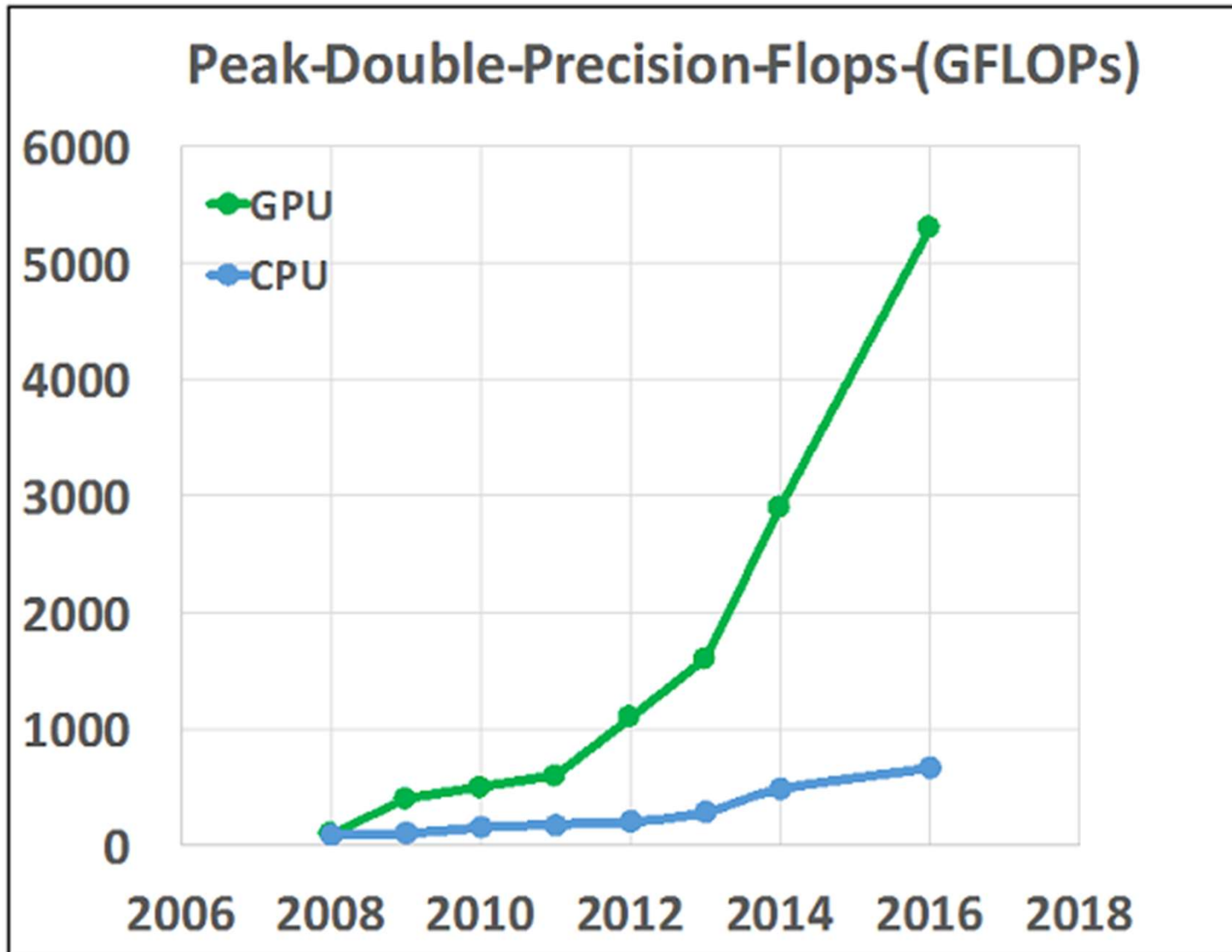
## Why is Deep Learning taking off?



**Rocket Engine : NVIDIA + Deep Learning Algorithm**

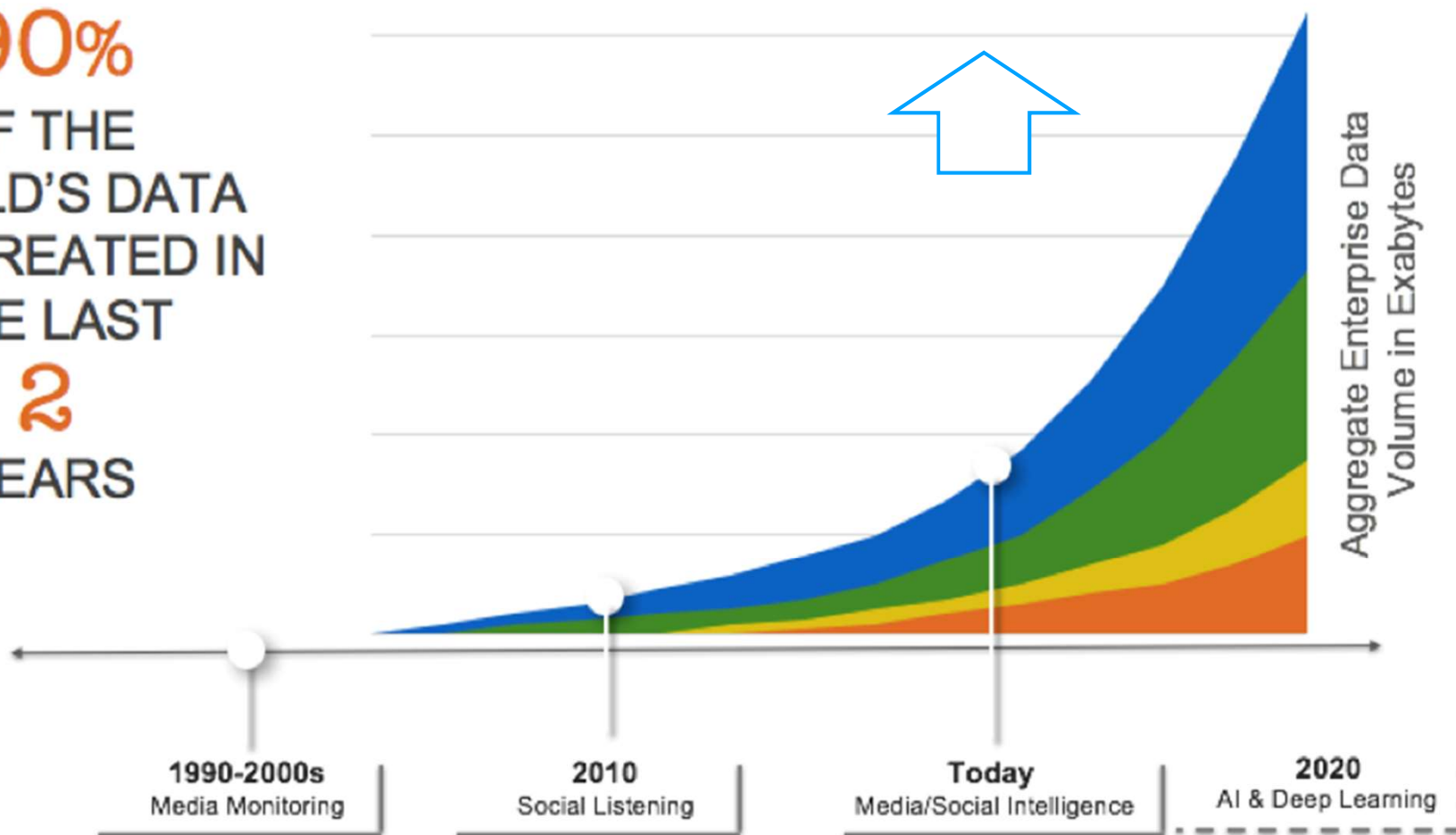
**Fuel : Data (25,000 pictures for cat)**

# CPU vs GPU Performance



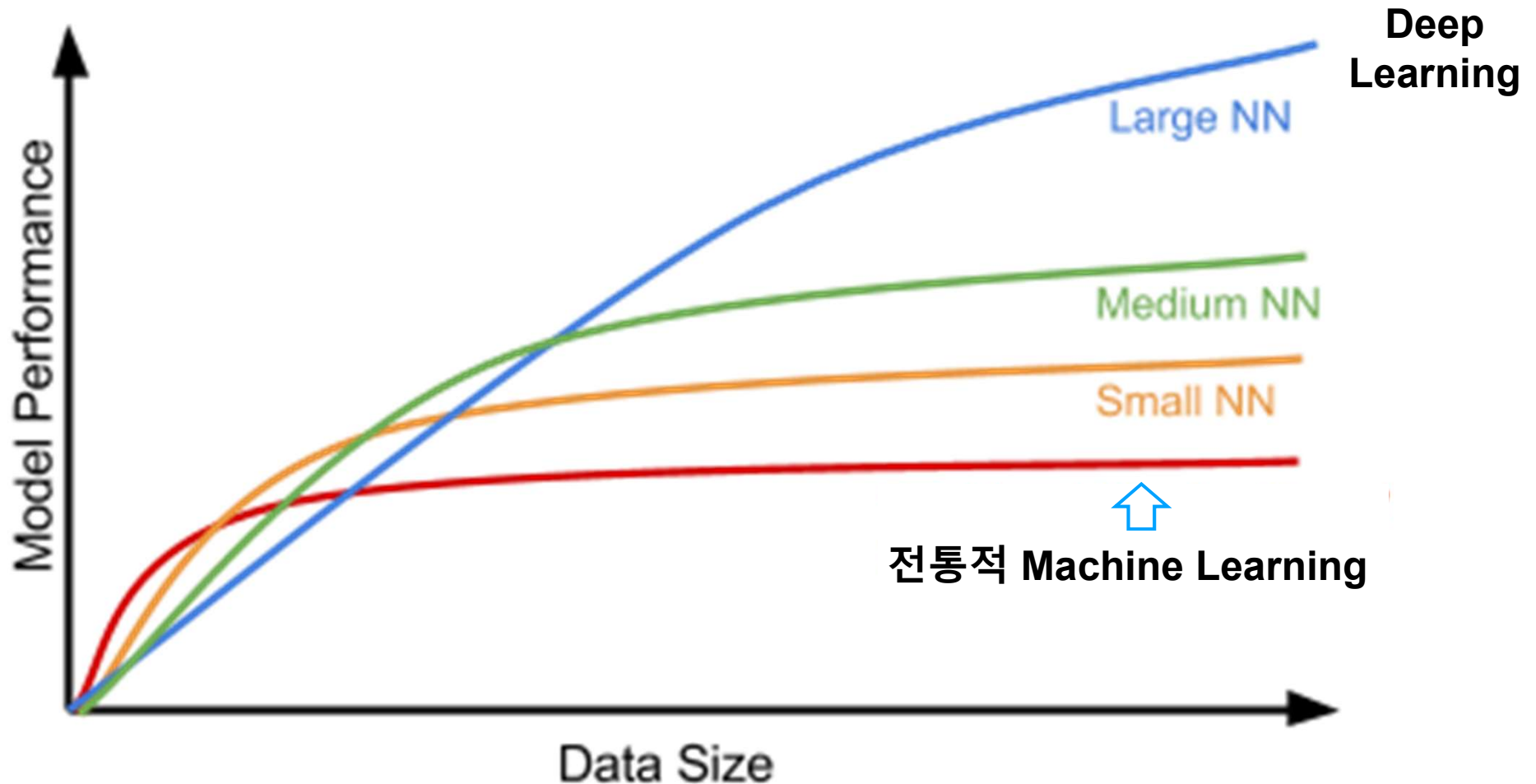
## 지도학습 모델의 획기적 성공 이유

**90%**  
OF THE  
WORLD'S DATA  
WAS CREATED IN  
THE LAST  
**2**  
YEARS

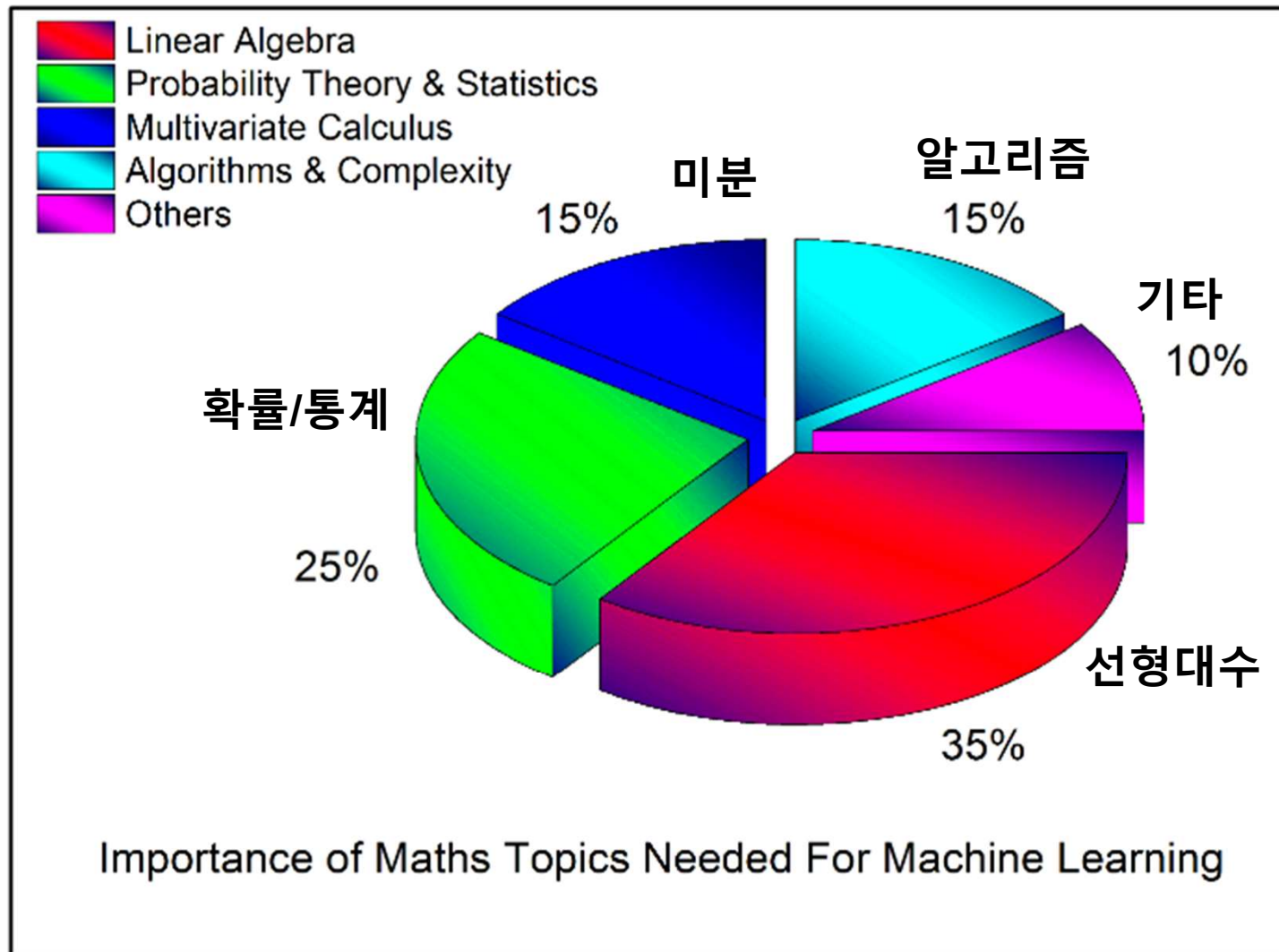




# 전통적 Machine Learning vs. Deep Neural Network



# Machine Learning 학습에 필요한 수학 지식



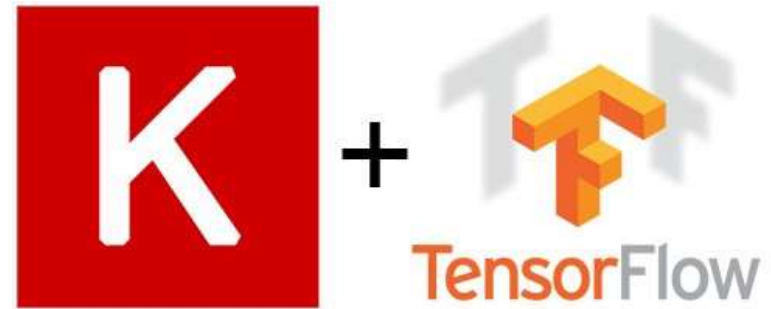
# Machine Learning



전통적 Machine Learning Tool:

- 벤치마크용 데이터셋 예제
- 데이터 전처리(preprocessing)
- 지도 학습(Supervised learning)
- 비지도 학습(Unsupervised learning)
- 모형 평가 및 선택 (evaluation and selection)

# Deep Learning



Deep Learning Tool:

- Pre-train model, Sample Dataset 제공
- Deep Learning 에 필요한 각종 함수 제공
- GPU support
- 각종 language 지원 API 제공

# 과정 SCOPE

- Crash Course – Numpy, Pandas, Matplotlib
- Linear Regression (선형회귀)
- non-Linear Regression (비선형회)
- KNN (K-Nearest Neighbor)
- Decision Tree
- Logistic Regression
- SVM (Support Vector Machine)
- Random Forest

- K-Means Clustering
- Tensorflow/Keras
- Simple Neural Network
- CNN
- RNN
- GAN(Optional)
- 실습문제