

# ML/DL for Everyone with PYTORCH

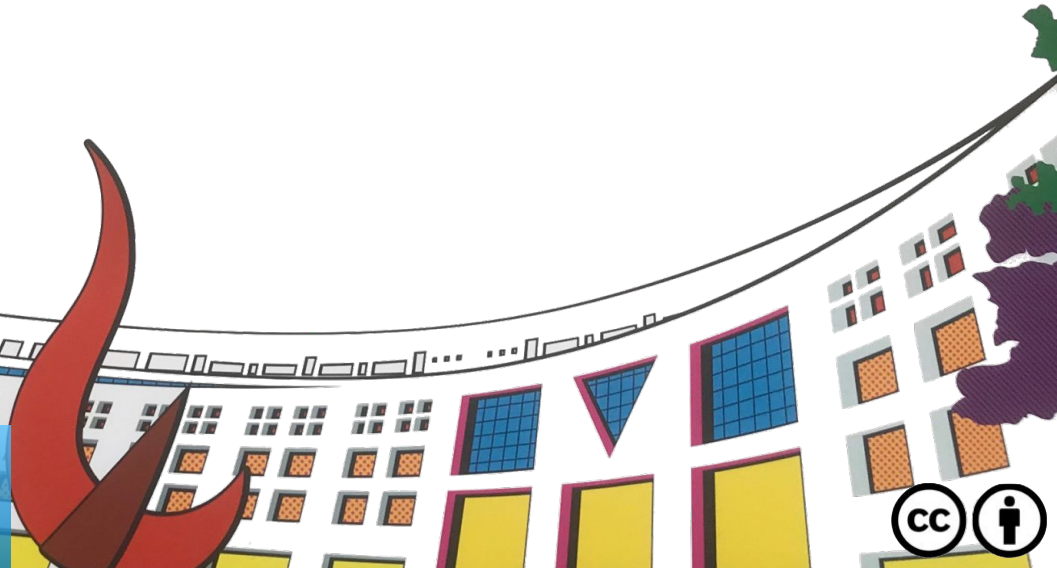
## Lecture 1: Overview



Sung Kim <[hunkim+ml@gmail.com](mailto:hunkim+ml@gmail.com)> HKUST

Code: <https://github.com/hunkim/PyTorchZeroToAll>

Slides: <http://bit.ly/PyTorchZeroAll>



# Call for Comments

Please feel free to add comments directly on these slides.

Other slides: <http://bit.ly/PyTorchZeroAll>





for your comments!

- Kyung Mo Kweon
- JooSung Yoon
- jungho choi
- 나로
- Junmo An
- Hwanhee Kim
- Stephen Lai

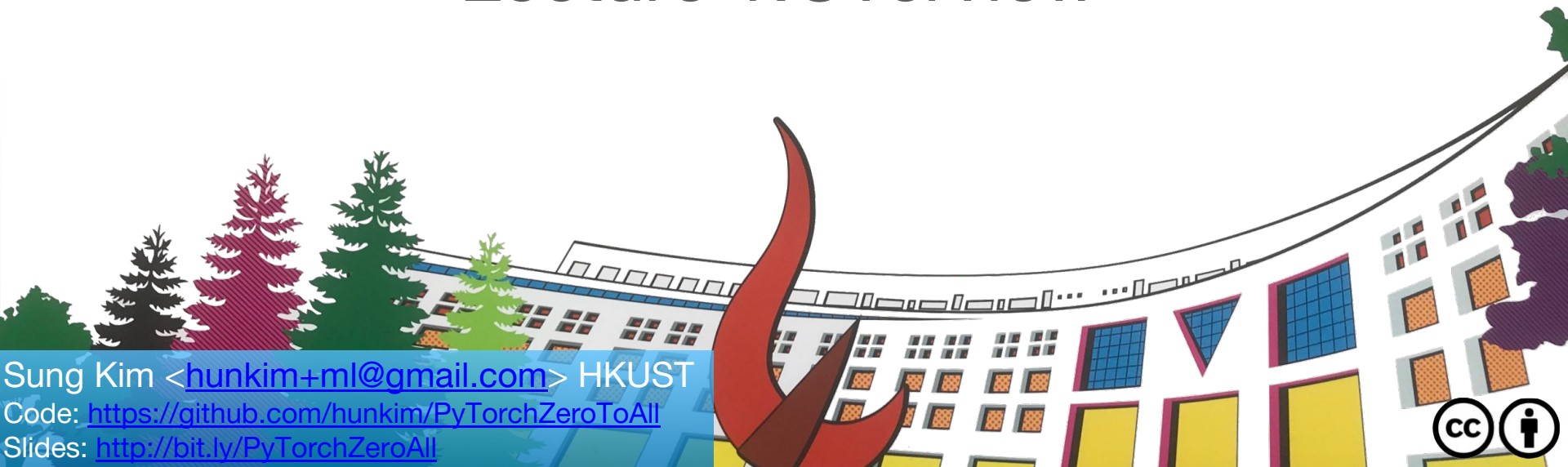
# ML/DL for Everyone with PYTORCH

## Lecture 1: Overview

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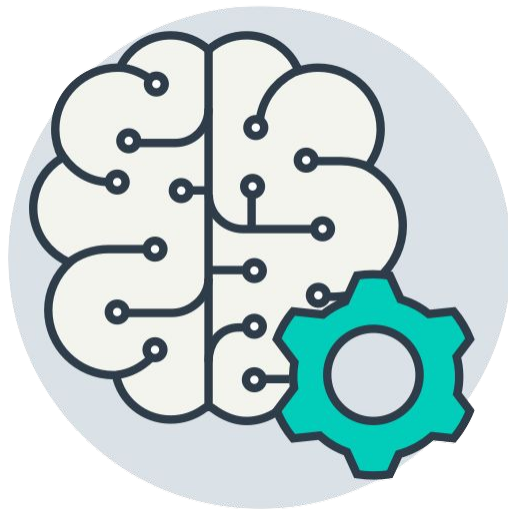
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# Goals

- Basic understanding of machine learning/deep learning
- PyTorch implementation skills
- Zero to All!

# What is ML?

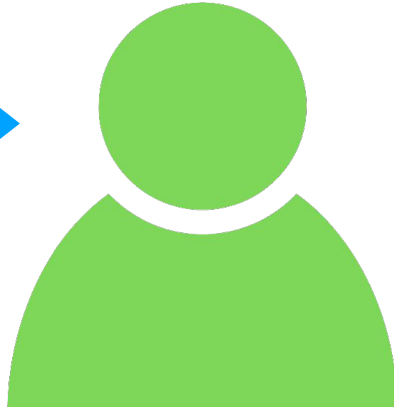
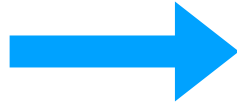


# What is Human Intelligence?



# What is Human Intelligence?

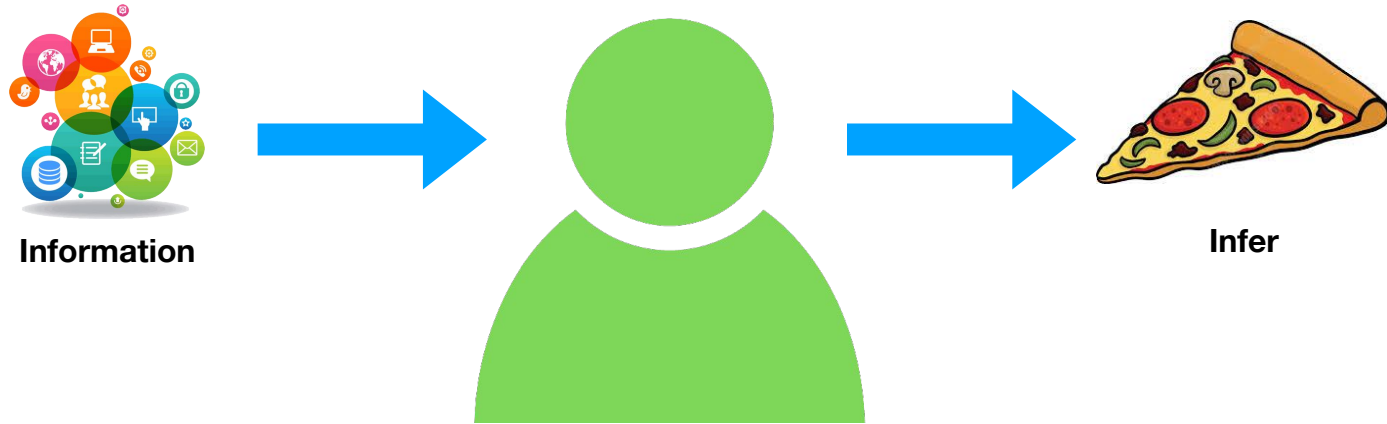
*What to eat for lunch?*





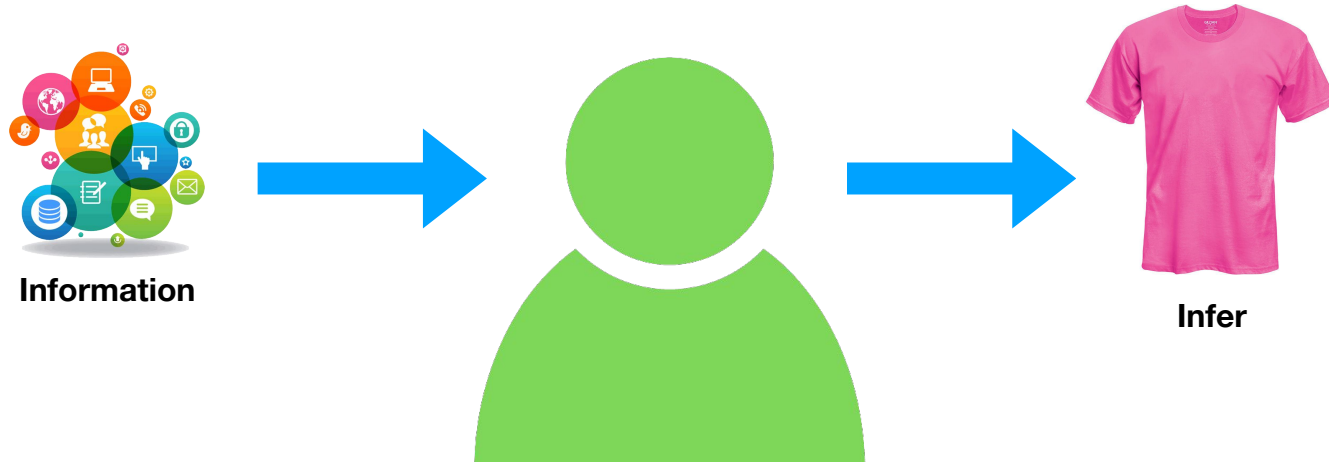
# What is Human Intelligence?

## *What to eat for lunch?*



# What is Human Intelligence?

## *What to dress?*



# What is Human Intelligence?

*What is this picture?*



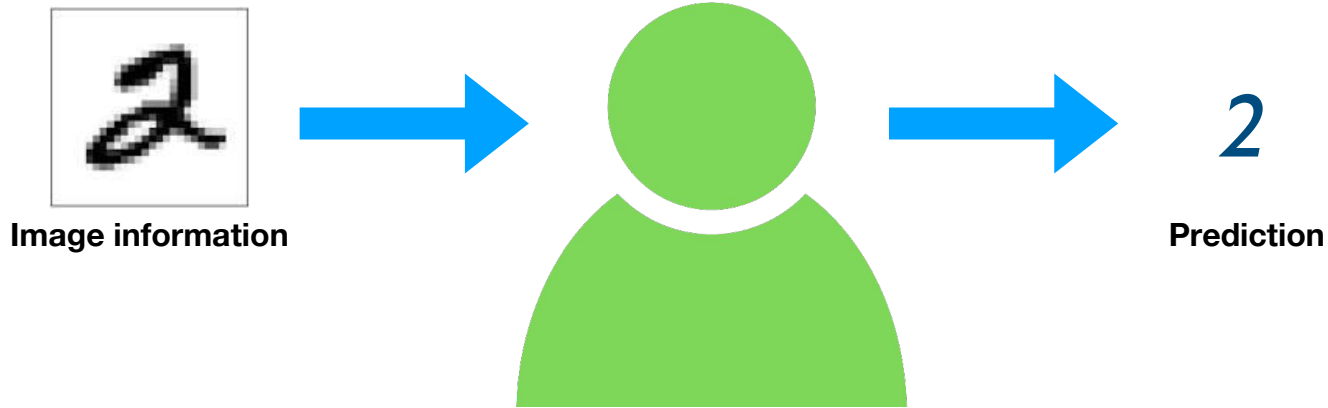
Image information



Prediction

# What is Human Intelligence?

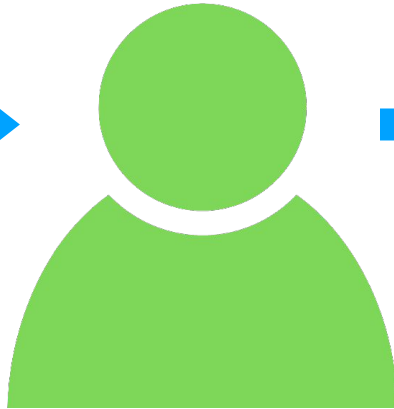
*What is this number?*



# What is Human Intelligence?

*What would be the grade if I study 4 hours?*

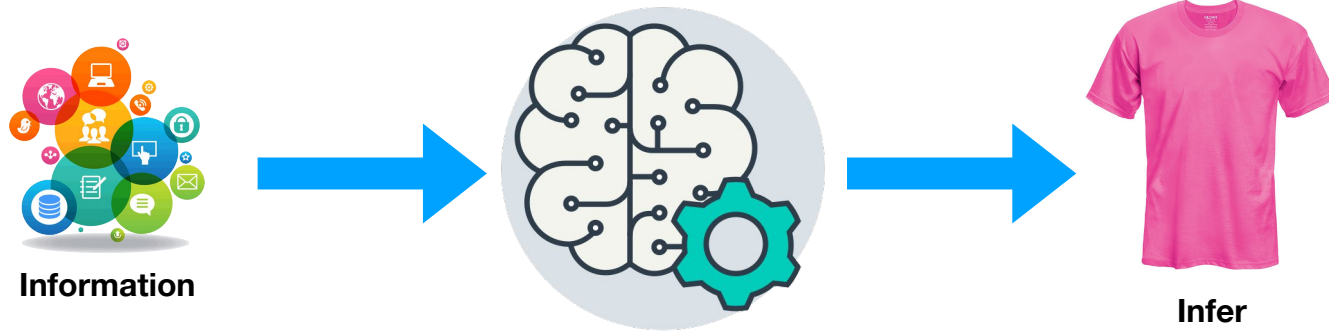
*4*  
*hours*  
information



*?*  
*points*  
Prediction

# Machine Learning

## *What to dress?*

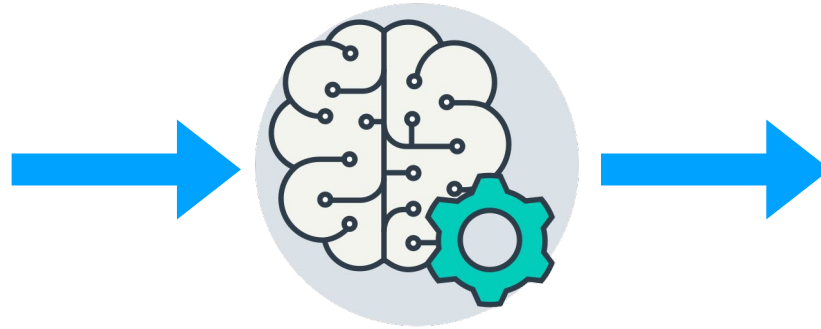


# Machine Learning

*What is this picture?*



Image information

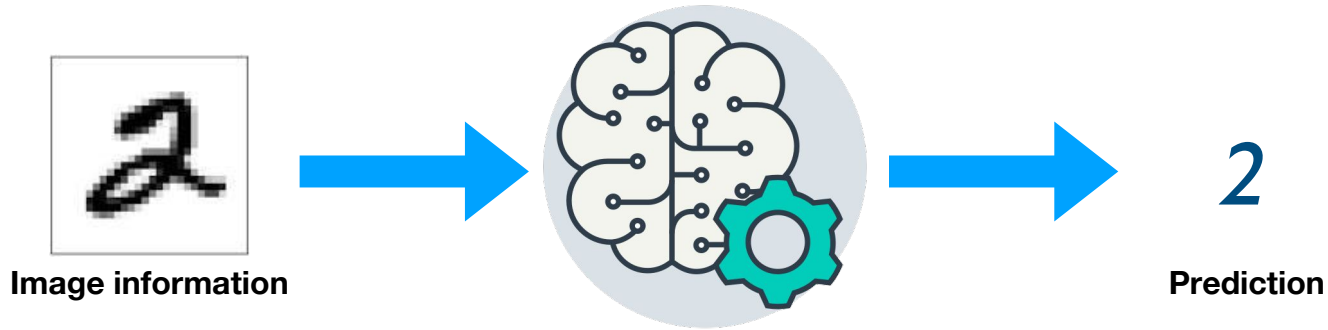


*CAT*

Prediction

# Machine Learning

*What is this number?*

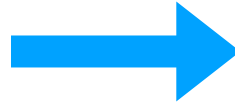
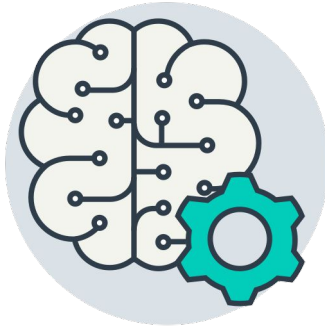
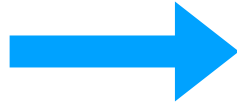




# Machine Learning

*What would be the grade if I study 4 hours?*

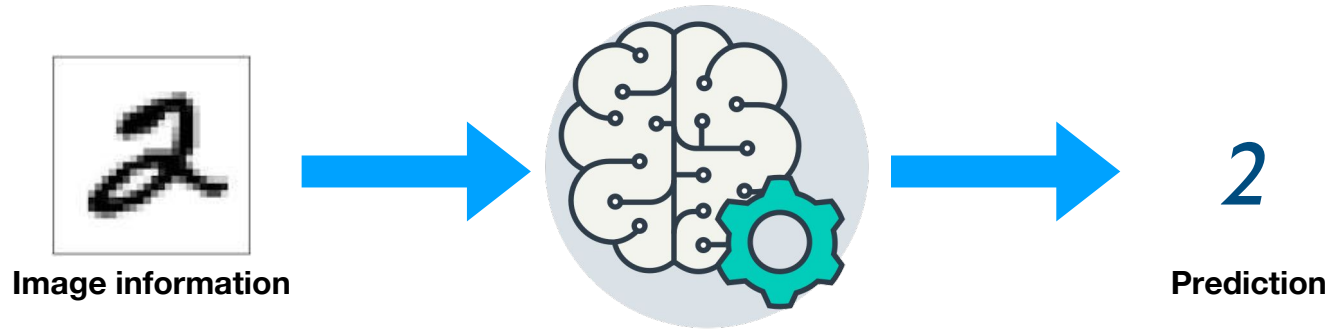
**4**  
*hours*  
information



**?**  
*points*  
Prediction

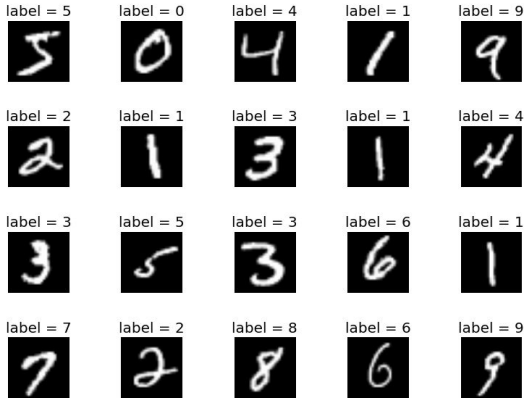
# Machine Learning

*Machine needs lots of training*

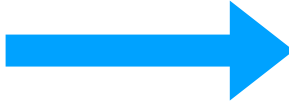


# Machine Learning

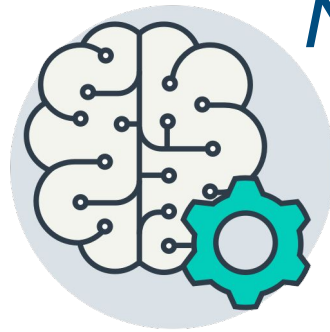
*Machine needs lots of training*



*Labeled  
dataset*



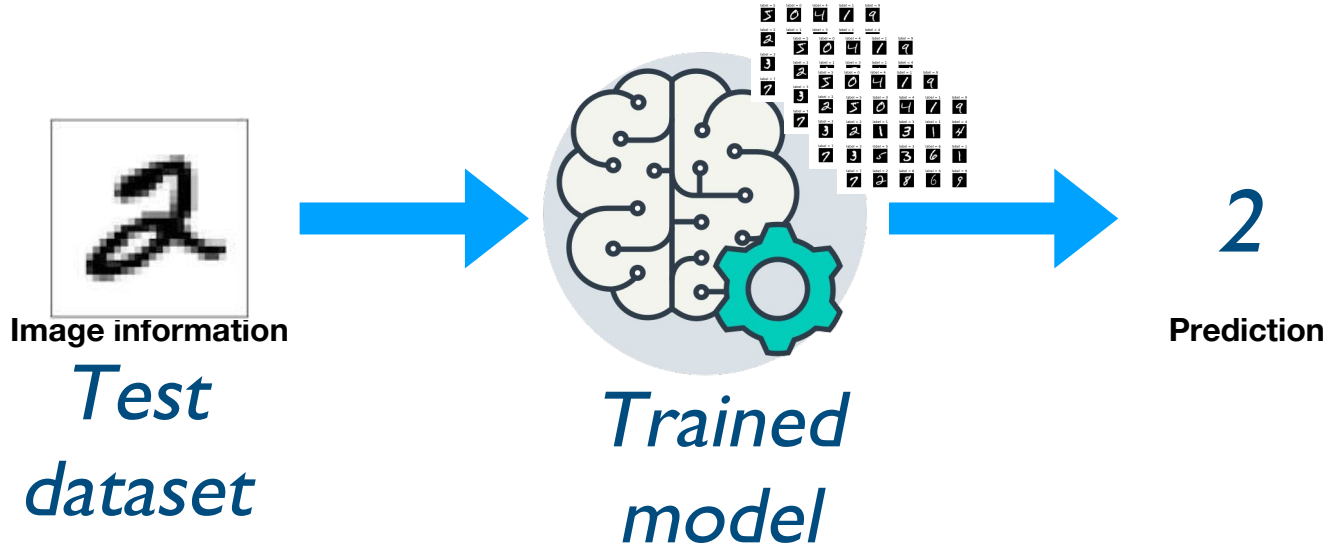
*training*



*Model*

# Machine Learning

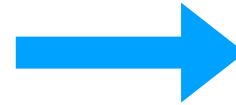
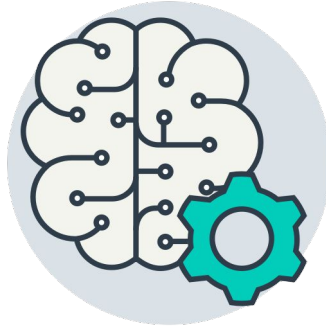
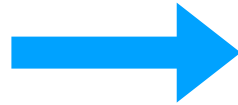
*Predict (test) with trained model*



# Machine Learning

*What would be the grade if I study 4 hours?*

*4  
hours*



*?  
points  
Prediction*

Hours (x)	Points (y)
1	2
2	4
3	6
4	?

**Training dataset**

**Test dataset**



PyTorch is a python package that provides two high-level features:

- Tensor computation (like numpy) with strong GPU acceleration
- Deep Neural Networks built on a tape-based autograd system

# Why PYTORCH

- More Pytonic (imperative)
  - Flexible
  - Intuitive and cleaner code
  - Easy to debug
- More Neural Networkic
  - Write code as the network works
  - forward/backward

# Install PYTORCH



## Get Started.

Select your preferences, then run the PyTorch install command.

Please ensure that you are on the latest pip and numpy packages.  
Anaconda is our recommended package manager

OS	Linux	<b>OSX</b>	
Package Manager	conda	<b>pip</b>	Source
Python	2.7	3.5	<b>3.6</b>
CUDA	7.5	8.0	<b>None</b>

### Run this command:

```
pip3 install http://download.pytorch.org/whl/torch-0.2.0.post3-cp36-cp36m-macosx_10_7_x86_64.whl
pip3 install torchvision
# OSX Binaries dont support CUDA, install from source if CUDA is needed
```



# Exercise I-I:

## Install PyTorch on your computer!

```
09:40 $ python3
Python 3.6.2 (v3.6.2:5fd33b5926, Jul 16 2017, 20:11:06
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> import torch
>>> print(torch.__version__)
0.2.0_3
>>> # Happy!!
```

# Topics

- Linear, Logistic, softmax models
  - DNN: Deep Neural Net
  - CNN: Convolutional Neural Net
  - RNN: Recurrent Neural Net
- 
- Write everything in PyTorch



## Lecture 2: Linear Model