Fakultas Informatika
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Pembelajaran Mesin
Machine Learning

Introduction

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What is Machine Learning?

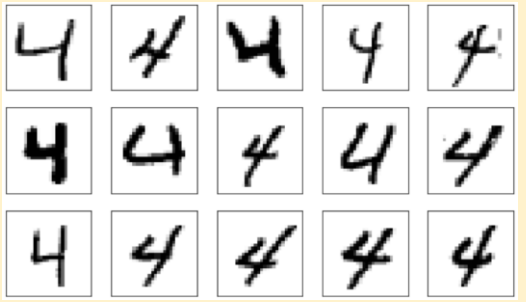
- For students with last digit of NIM is between 0-2
- Search a definition of machine learning by yourselves
- Read and understand it
- Open Jamboard, Choose sticky note
- Write the definition with your own words (do not copy paste)
- Don’t forget to put your name at the top of the sticky note
- Try to have different answers from the others

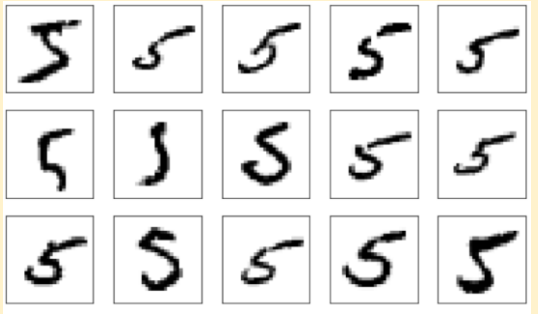
What is Machine Learning?

- Part of Artificial Intelligence
- Learn From Data
- Without specific Instruction

Human Learning

- Let’s say
- I give you dataset containing 2 kind of images
- With correct answers for each image (4 or 5)





- Now, I give you new image

Very Easy for Human

- Can you cla[illegible]y the correct answer for the new image?

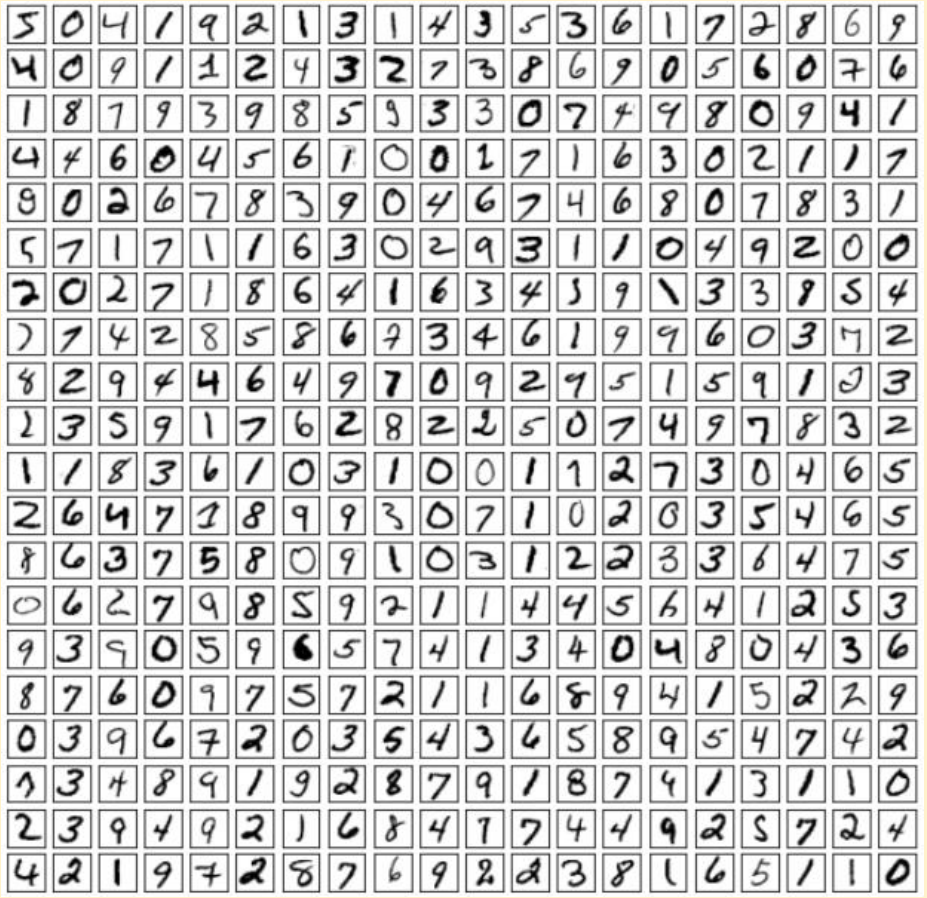
Machine Learning?

- What about Machine or Computer?
- How can you tell the computer which one is 4 and which one is 5?
- What are the rules? Pixel? Shape?
- It is hard to define rules for all variations even for one digit!

Very Hard for Computer

Ask Computer to Learn by itself

- MNIST Dataset has 10 categories of images
- With 70.000 images
- With correct answer for each image
- Can we ask computer to learn by itself?



Let’s see a Demonstration

- https://colab.research.google.com/drive/1W49O-o_xld8ztN318k9m4N34zW28tbg3?usp=sharing

Why need Machine Learning?

- If Human is so powerful in learning, why need Machine to learn?

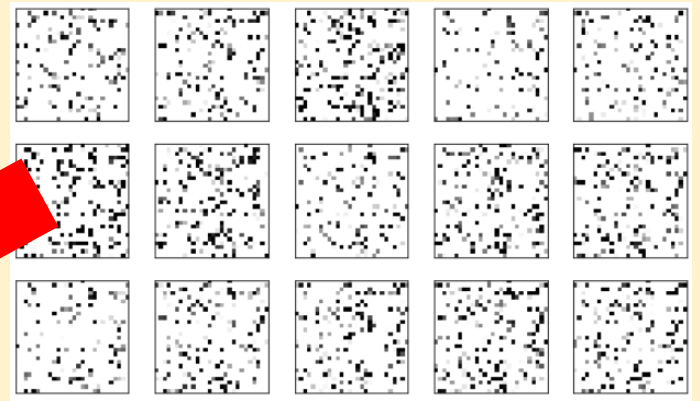
Where Computer Better than Human?

- I Give you image data with 2 category, A and B
- Now, I give you a new image.

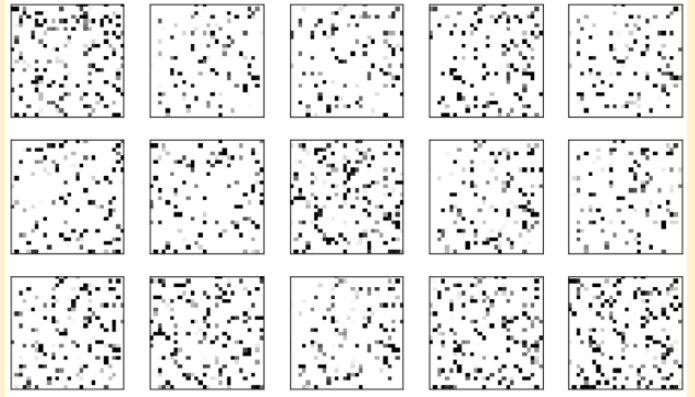
- Which categ[illegible]he new image is?

Very Hard for Human

A



B



Let’s see a Demonstration

- https://colab.research.google.com/drive/1diWynVX6CfDqNXgCk1na56FCrHJa4Ymq?usp=sharing

Where Computer Better than Human?

Human:

- Visual Pattern
- Few Example

Computer:

- Speed
- Memory
- Lots of Data

What are Applications of Machine Learning?

- For students with last digit of NIM between 3-5
- Search an application of Machine Learning in real life
- Read and understand it
- Write it on jamboard with your own words (do not copy paste)
- Don’t forget to put your name at the top of the sticky note
- Try to have different answers from the others

What are Applications of Machine Learning?

Taxonomy Related to Machine Learning

- For all students
- Each student must find a concise definition/description of the given term
- When you search, remember that all the given terms are related to Machine Learning
- Write on sticky notes with your own words
- Don’t forget to put your name

Taxonomy Related to Machine Learning

NAME	TERM
ADRIAN PUTRA PERDANA	Artificial Intelligence
MUHAMMAD FARHAN AUDIANTO	Deep Learning
ENRICO CHRISTOPHER REINHARD	Data Mining
KETUT SUDYATMIKA PUTRA	Feature
MUHAMMAD AUFA ANASIN	Label
RAFLY MIZALFI	Unsupervised Learning
RADEN ARIA GUSTI AJI	Supervised Learning
JONAS DE DEUS GUTERRES	Model
INACIO CAMPOS	Ensemble Learning
ARMANDO JACQUIS FEDERAL ZAMELINA	Reinforcement Learning
AURORA STEPINIT SAZAFI	Training
DIYA NAMIRA PURBA	Preprocessing
ALDILLA RAFI	Data Normalization

NAME	TERM
YUSUF IQBAL KUSUMA YUDA	Outlier
FAISAL ADLY ADITYA PRADANA	K-means
AZKA JAUHARY THANTHAWY SUKANDA	Decision Tree
THORIQ PUTRA RENALDI	Random Forest
SALSABILLA RINALDI	Single Layer Perceptron
RAHMATURRAMADHAN	Neural Network
YUSRON HANAN ZAIN VIDI IMTINAN	Q-Learning
PRABOWO NOFIELDI	Recurrent Neural Network
HAFIZH ENGGAR KUSWIHARSO WICAKSONO	Long Short Term Memory
NAUFAL MUHAMMAD ATHIF	Convolutional Neural Network
MUCHLIS RAMADHAN USMAN	Accuracy
LALU M. RIZA RIZKY	Precision Recall
KEVIN FERDIANSYAH	Overfitting

Taxonomy Related to Machine Learning

- Let’s draw the taxonomy

Demo Reinforcement Learning

- https://cs.stanford.edu/people/karpathy/convnetjs/demo/rldemo.html

Risk vs Benefit of Machine Learning

Risk

- For students with last digit of NIM is 6

Benefit

- For students with last digit of NIM is 8

The Future of Machine Learning

- For students with the last digit of NIM is 7 or 9

Any Question?