李宏毅 (Hung-yi Lee) · HYLEE | Machine Learning (2021)

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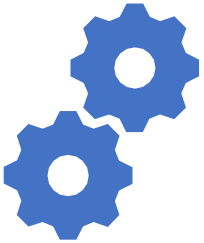
Machine Learning (ML) 2021



李宏毅

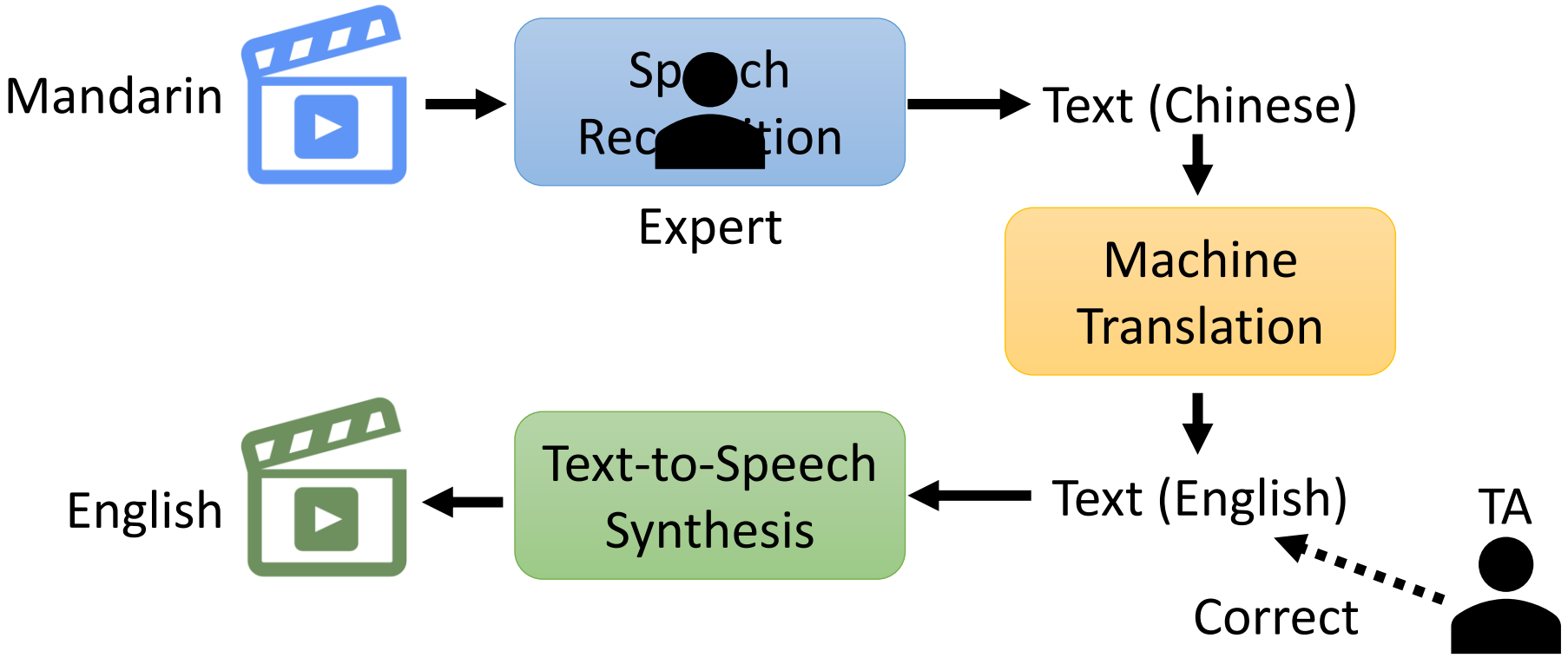
Hung-yi Lee

About this course

- This course has both **Mandarin** and **English** versions.
- Time slot: 2:20 p.m. – 6:20 p.m., Friday

How to achieve that?

Help of Technology!

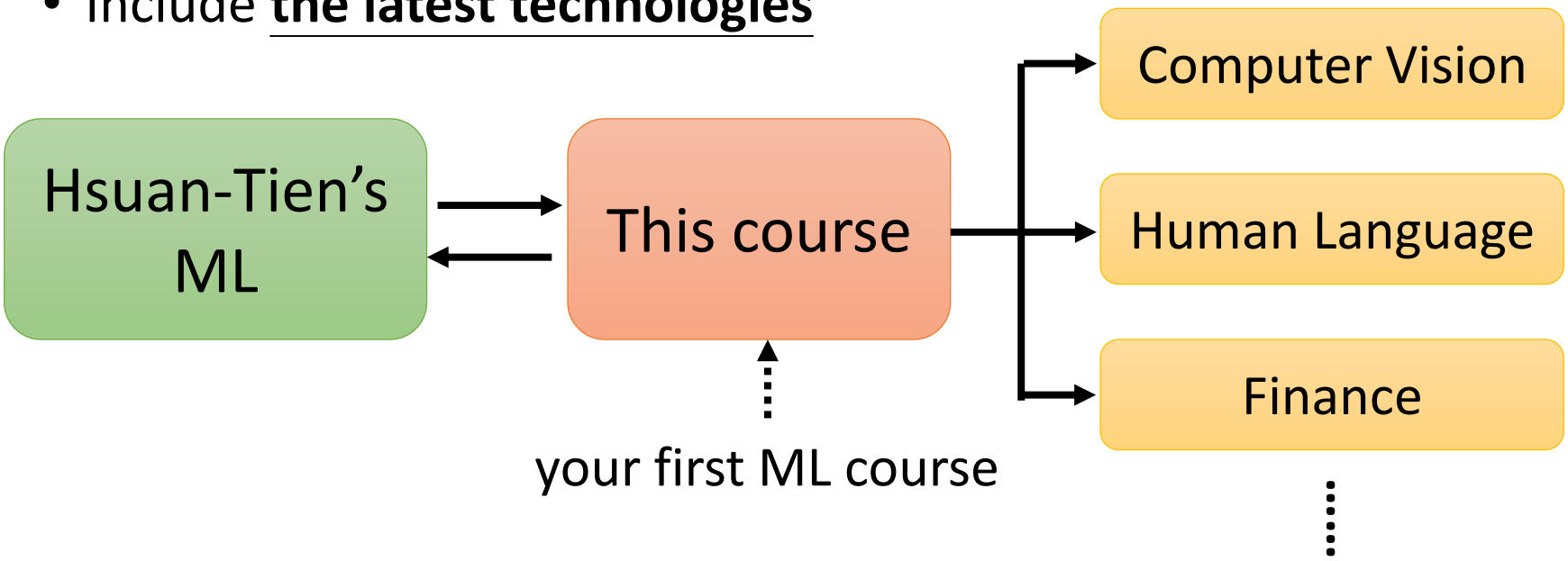


The lectures of the English course will be one week behind the Mandarin one.

The homework announcement and deadline of the English and Mandarin courses are the same.

Orientation

- Focus on **deep learning**
  - This course can be your first ML course.
  - Little overlap with Hsuan-Tien Lin's (林軒田) *Machine Learning Foundations* and *Machine Learning Techniques.*
- Include **the latest technologies**



Orientation

It’s buffet style.

About this course

- You can complete this course online.
  - Record all the lectures, submit homework online, no exam.
- No prerequisite test, no upper limit for the number of students.

Everyone can take this course!

Special thanks to

國立台灣大學教務處

National Taiwan University

Office of Academic Affairs

Assignment

Prerequisite

- **Math:** Calculus (微積分), Linear algebra (線性代數) and Probability (機率)
- **Programming**
  - All the assignments have sample codes based on **Python**.
  - You need to be able to read and modify the sample codes. **This course will not teach Python.**
  - Only focus on ML. **This course will not teach any Python package, except PyTorch.**
  - TAs do not have to answer the questions not related to ML or PyTorch.
- **Hardware**
  - All assignments can be done by Google Colab. You do not need to prepare hardware or install anything.

Assignment

- Each assignment includes multiple-choice questions and/or leaderboard (排行榜).
  - Multiple-choice questions: submitted via NTU COOL.
  - Leaderboard: Kaggle or JudgeBoi (our in-house Kaggle ☺)
    - Explain later
- You also need to submit the related codes of each assignment via NTU COOL.

Grading Criterion

- There are 15 assignments (each has 10 points, only count the 10 assignments with the highest points)
- You don't need to do all the assignments. Choose the ones you are interested in.
- You are encouraged to complete all 15 assignments!

You decide how much you want to learn.

Grading Criterion

C-

- The assignments have sample codes.
- Simply running all the sample codes leads to C-.

A-

- There is guidance for each homework
- Write your codes following the guidance.

A+

- We set some challenges for you.
- Conquer by yourself (think, read papers, etc.)

You decide how deep you want to learn.

Assignment Schedule

		Start	End	Kaggle	JudgeBoi	MC
1	Regression	3/05	3/26	O		
2	Classification	3/12	4/02	O		O
3	CNN	3/26	4/16	O		
4	Self-attention	3/26	4/16	O		
5	Transformer	4/09	4/30		O	
6	GAN	4/16	5/14		O	
7	BERT	4/30	5/21	O		
8	Autoencoder	4/30	5/21	O		
9	Explainable AI	5/07	5/28			O
10	Attack	5/07	5/28		O	
11	Adaptation	5/21	6/11	O		
12	RL	6/04	6/25		O	
13	Compression	6/11	7/02	O		
14	Life-long	6/11	7/02			O
15	Meta Learning	6/18	7/09			O

Lecture Schedule

Lecture Schedule

Date	Topic	HW
3/05	Introduction	Regression
3/12	Deep Learning	Classification
3/19	Theory of ML (Prof. Pei-Yuan Wu)	
3/26	Self-attention	CNN / Self-attention
4/02	Spring break (No class)	
4/09	Transformer	Transformer
4/16	Generative Model	GAN
4/23	Midterm (No class)	
4/30	Self-supervised	BERT / Autoencoder
5/07	Explainable AI / Adversarial Attack	Explainable AI / Attack
5/14	Privacy v.s. ML (Prof. Pei-Yuan Wu)	
5/21	Domain Adaptation/ RL	Adaptation
5/28	Quantum ML (Prof. Hao-Chung Cheng)	
6/04	RL	RL
6/11	Life-long / Compression	Life-long / Compression
6/18	Meta Learning	Meta Learning

Lecture Schedule

- For the weeks I give a lecture, there will be an assignment announcement.
  - Playing recording: 2:20 p.m. – 4:30 p.m. (approx.)
    - Highly related to the assignment
  - Assignment announcement: 4:30 p.m. – 5:30 p.m. (approx.)
  - TA hour: 5:30 p.m. – 6:20 p.m.
    - You can do the assignment yourself and ask questions immediately.

Lecture Schedule

Date	Topic	HW
3/05	Introduction	Regression
3/12	Deep Learning	Classification
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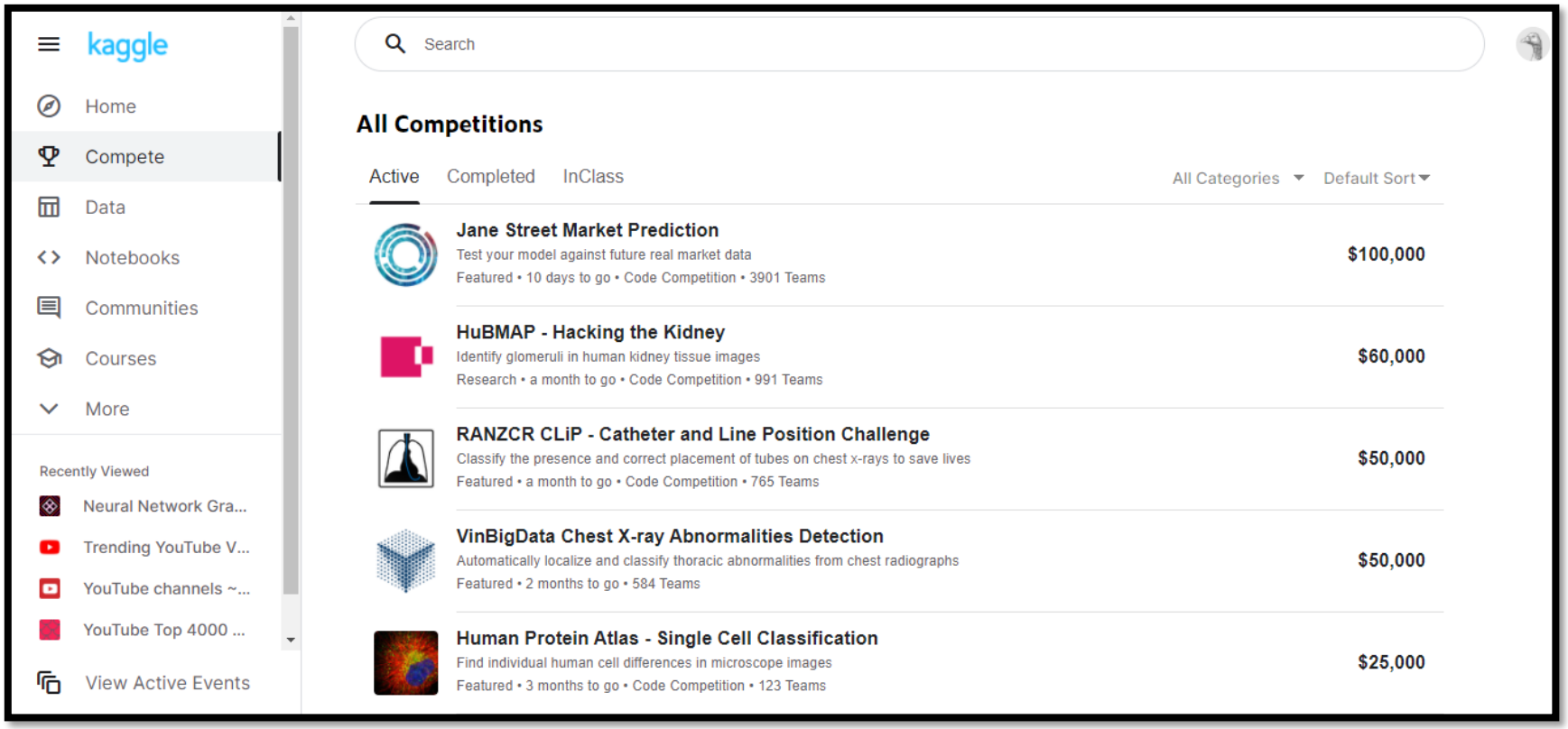
5/21	Domain Adaptation/ RL	Adaptation
5/28	Quantum ML (Prof. Hao-Chung Cheng)	

The guest lectures will be in Mandarin. Don’t worry. They are not related to the assignments.

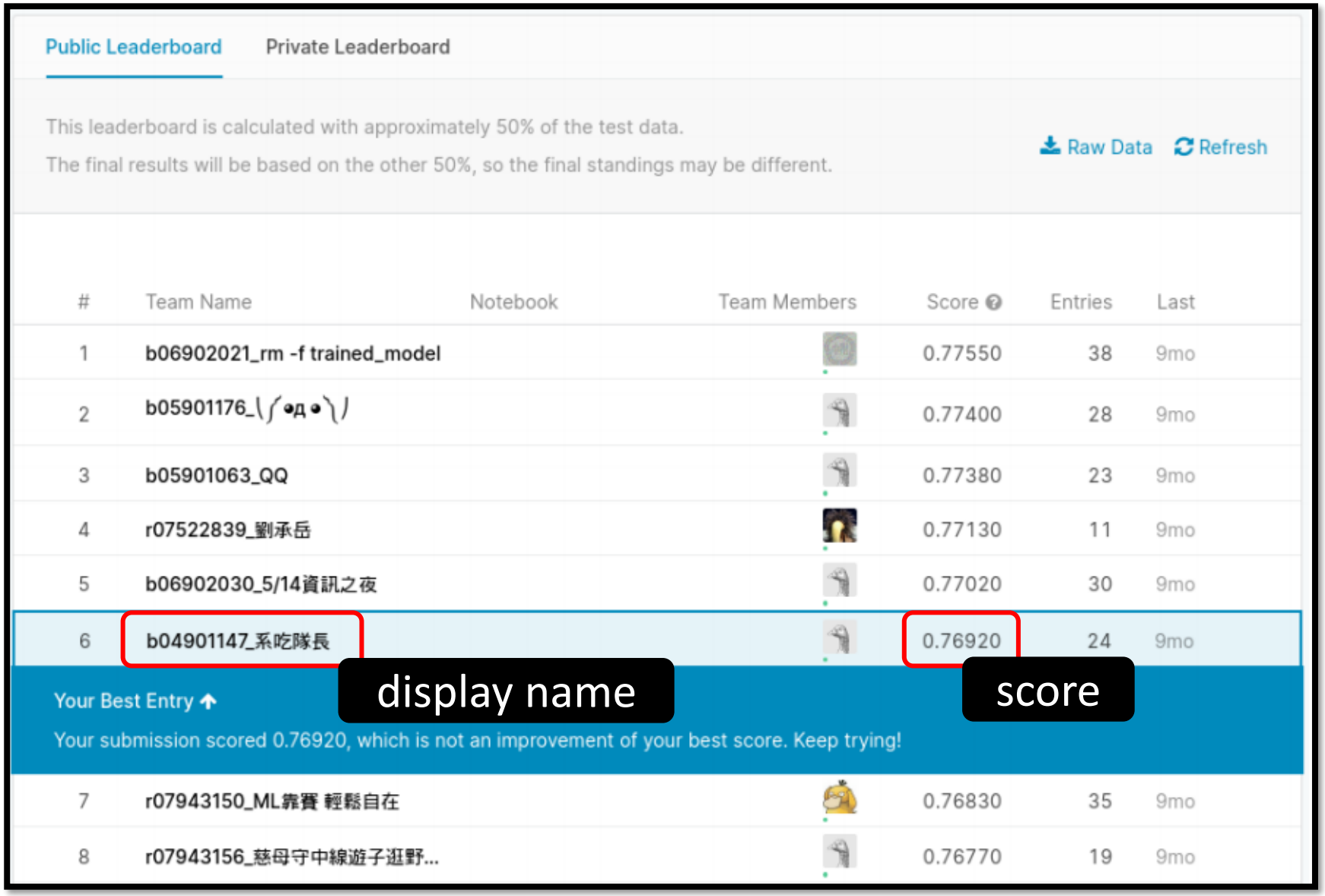
Kaggle

Kaggle (JudgeBoi is similar)

https://www.kaggle.com/



- Some assignments are in-class competition on Kaggle.
- Register a Kaggle account by yourself.



Public Leaderboard | Private Leaderboard

This leaderboard is calculated with approximately 50% of the test data.
The final results will be based on the other 50%, so the final standings may be different.

Raw Data | Refresh

#	Team Name	Notebook	Team Members	Score	Entries	Last
1	b06902021_rm -f trained_model			0.77550	38	9mo
2	b05901176_\(ʃ •д•)\/			0.77400	28	9mo
3	b05901063_QQ			0.77380	23	9mo
4	r07522839_劉承岳			0.77130	11	9mo
5	b06902030_5/14資訊之夜			0.77020	30	9mo
6	b04901147_系吃隊長			0.76920	24	9mo

display name

score

Your Best Entry ↑

Your submission scored 0.76920, which is not an improvement of your best score. Keep trying!

#	Team Name	Notebook	Team Members	Score	Entries	Last
7	r07943150_ML靠賢 輕鬆自在			0.76830	35	9mo
8	r07943156_慈母守中線遊子逛野...			0.76770	19	9mo

Kaggle

- The display name should be

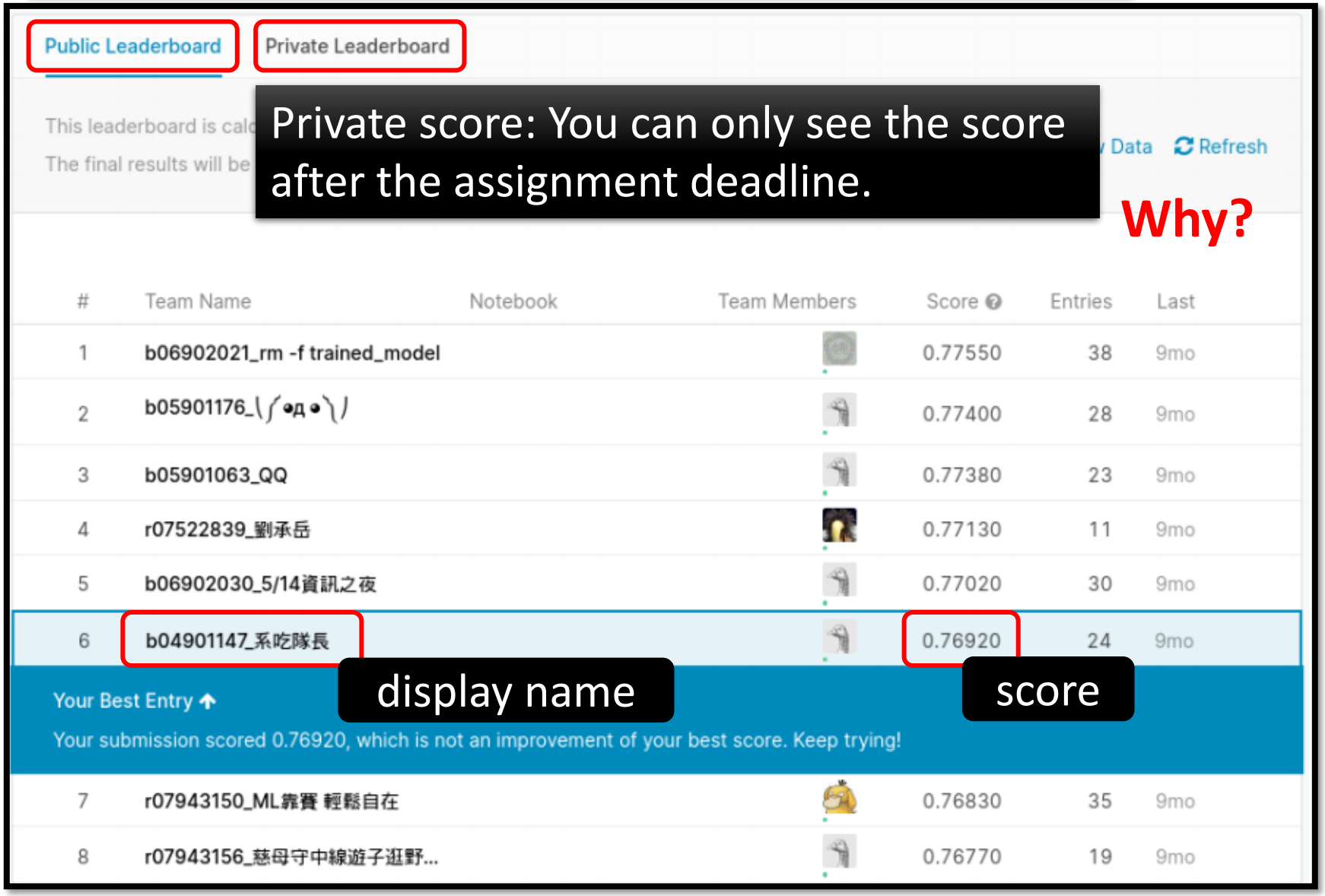
<STUDENT ID>_<ANY THING>

b93901106 — truly any thing ☺

- Example
  - ⭕ b93901106_pui pui pui pui pui pui pui pui
  - ⭕ b93901106_
  - ✖ b93901106 puipui

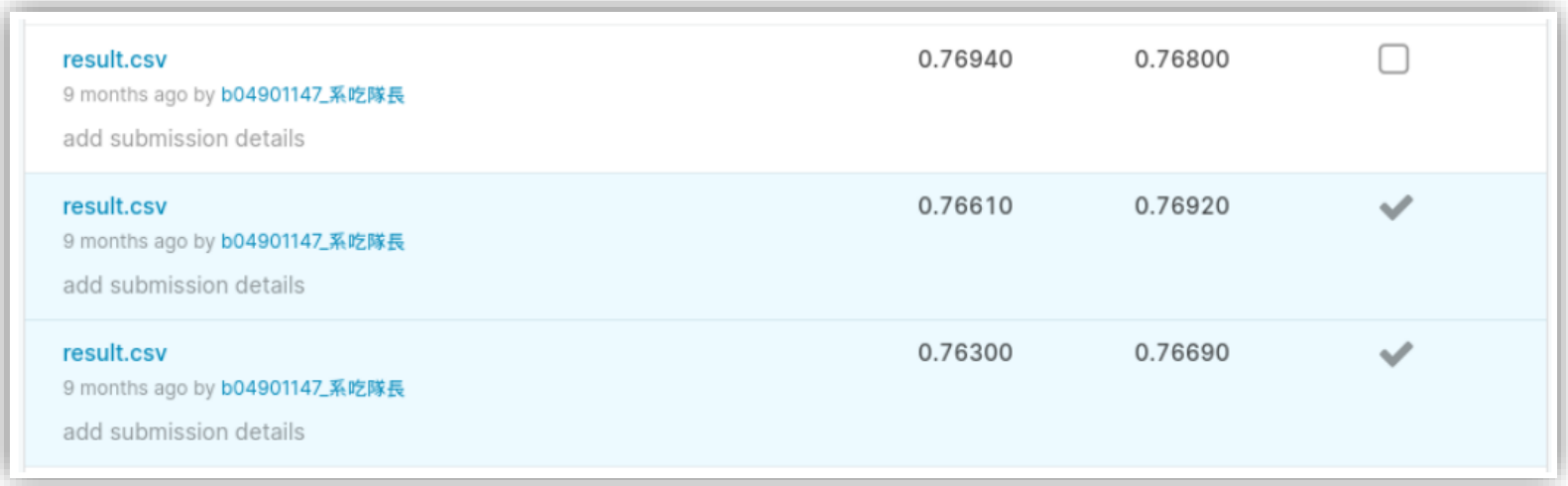
We will not find your submission if your format is wrong!

Public score: You can see it right after the submission.



Kaggle

- You need to select two results for evaluating on the private set before the assignment deadline.



- You only have limited submission times per day.

Why?

Rules

Rules – Common Sense

- Don’t plagiarize other’s code and don’t submit other’s results to the leaderboards.
  - “***Other***” means *all creatures in the universe*
  - Changing the names of variables also considered plagiarism. (Plagiarism is checked by the software!)
- Protect your efforts! Don’t let others see your codes, don’t give others your results.
  - Lending your codes to others or allowing others to copy your work will be considered as collusion, thus receiving the same punishment as the plagiarist.

Rules – For Kaggle and JudgeBoi

- There is a limited number of submissions to all the leaderboards (Kaggle and JudgeBoi).
  - Don’t try to have multiple accounts. (It also violates the rules of Kaggle.)
  - Don’t borrow account from others and don’t give you account to others.
  - Don’t submit to the leaderboards of the previous semesters.
  - **Don’t use any approach to increase the submission numbers**

Rules – For Kaggle and JudgeBoi

- The results submitting to the leaderboards should **only come from machines**.
  - Don’t label the testing data by humans (or any other approaches)!
- The data used in assignments is publicly available. **Don’t use the labels of testing data in any way!**
  - **Tip**:
    - Don’t try to find the data used in assignments online at the very beginning.
    - Only use the data provided in each assignment.

Rules - Codes

- You need to submit codes for each assignment via NTU COOL.
- Your codes need to be able to generate the results you submit to the leaderboard.
  - If not, it would be considered ***cheating*** and get punishment.
  - TAs may not run all the codes, but TAs will check some of them.
  - If you get 10 points in the assignment, your code will be open to the whole class (作業觀摩).
  - TAs and the lecturer decide cheating or not.

Punishment

- The **first time** you violate the rules.
  - The final score of this semester times 0.9.
- The **second time** you violate the rules.
  - Fail the course.

Information

Webpage

You can find slides and lecture recordings here.

姜成翰

who made this webpage

https://speech.ee.ntu.edu.tw/~hylee/ml/2021-spring.html

Questions

- **Option 1**: Ask at TA hour
- **Option 2**: Post your questions on NTU COOL
  - Your questions are also other's questions.
- **Option 3**: Mail to the following address
  - E-mail: ntu-ml-2021spring-ta@googlegroups.com
  - E-mail title includes "[hwX]" (e.g. [hw3])
- Don't direct message to TAs. The TAs will only answer the questions by the above alternatives.

張凱為

Mandarin Course
TA head

黃冠博

English Course
TA head

TA email: ntu-ml-2021spring-ta@googlegroups.com

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