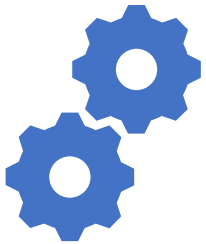
2022 機器學習課程規定



李宏毅

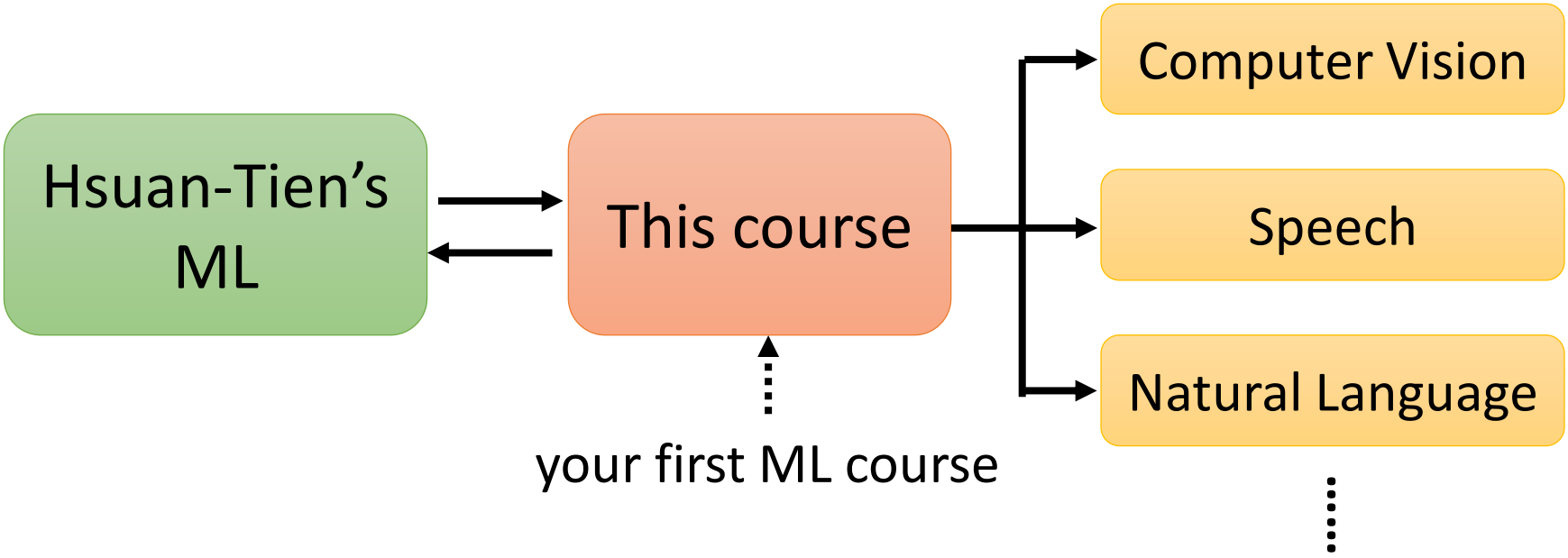
Hung-yi Lee

About this course

- Time slot: 2:20 p.m. – 6:20 p.m., Friday
- Classroom: 博理 112
  - Live streaming during the lecture time
  - All lectures will be recorded
- You can complete this course online.
  - submit homework online, no exam
- Prerequisite
  - Math: Calculus (微積分), Linear algebra (線性代數) and Probability (機率)
  - Programming: You can read and write python code.

About this course

- Focus on **deep learning**
  - Can be your first machine learning (ML) course.
  - Little overlap with Hsuan-Tien Lin's (林軒田) *Machine Learning Foundations* and *Machine Learning Techniques.*



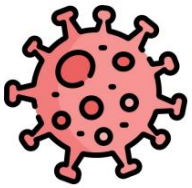
About this course

- Focus on **deep learning**
  - Can be your first machine learning (ML) course.
  - Little overlap with Hsuan-Tien Lin's (林軒田) *Machine Learning Foundations* and *Machine Learning Techniques.*
- Covering **broad aspects**
  - Try to cover most important technology and concepts you need to know (buffet style!)
  - Not delve into most topics. This is your first ML course, not the last one.
- Covering **the latest technology**
- **Application oriented**

Applications

COVID-19

HW1



Computer Vision

→ CNN →

HW 3, 8, 9, 10,11

cat

attack, adaptation, compression, explanation, anomaly detection

Image generation HW 6

Natural Language Processing

HW 5

HW 7

Speech Processing

HW 2

HW 4

RL

HW 12

Webpage

- All the recording and assignments will be available on the course webpage.
- Course webpage: https://speech.ee.ntu.edu.tw/~hylee/ml/2022-spring.php

Assignment

Assignment

- Most assignments include report, leaderboard, and code submission.
  - Report: answer some questions
  - Leaderboard (排行榜): Kaggle or JudgeBoi (our in-house Kaggle ☺)
    - Simple, medium, strong, boss baselines
  - Submit the related codes of each assignment via NTU COOL.
- All assignments can be done by Google Colab. You can **pass** this course without preparing hardware or install anything.
- But usually more computing resources lead to better performance.

Grading Criterion

分數與等第換算按照學校建議
http://www.bebi.ntu.edu.tw/uploads/root/Regulations.pdf

- 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.

It's buffet style.

Disclaimers

- This course will NOT teach Python.
- This course will NOT teach any Python package, except PyTorch.
- Only focus on ML. TAs do not have to answer questions not related to ML or PyTorch.
- All TAs' sample codes can be run on Colab. If you use your own device, TAs have no obligation to solve all problems.
- TAs have no obligation to help you pass the baselines.
- This course will NOT provide computing resources.
- When it comes to network training, your efforts are not always proportional to your performance.
- Network training can take a long time.

培養強健的心理素質

Lecture Schedule

https://speech.ee.ntu.edu.tw/~hylee/ml/2022-spring.php

課程網站

上課前看完　上課補充　　額外補充資料

Week	Date	Topic	Preparation - zh	Preparation - en	Class Videos	Class Notes	Extra Material
第一週	2/18	Introduction of Deep Learning	Video 1 Video 2	Video 1 Video 2	#	English class course intro: ppt/pdf Chinese class course intro: ppt/pdf Introduction of ML/DL: ppt/pdf	Introduction of Deep Learning:Video Backpropagation:Video Predicting Pokémon CP:Video Pokemon classification:Video Logistic Regression:Video
第二週	2/25	What to do if my network fails to train	Video 1 Video 2 Video 3 Video 4 Video 5	Video 1 Video 2 Video 3 Video 4 Video 5	#	Guideline of ML: overfit: ppt/pdf Critical Point:small gradient: ppt/pdf AdaptiveLearning Rate: optimizer: ppt/pdf Loss ofClassification: classification: ppt/pdf	Gradient Descent (Demo by AOE):Video Gradient Descent (Demo by Minecraft):Video beyond Adam (part 1):Video beyond Adam (part 2):Video
第三週	3/04	Image as input	Video	Video	#	CNN: ppt/pdf	Spatial Transformer Layer:Video

每一個主題都有一個對應的作業

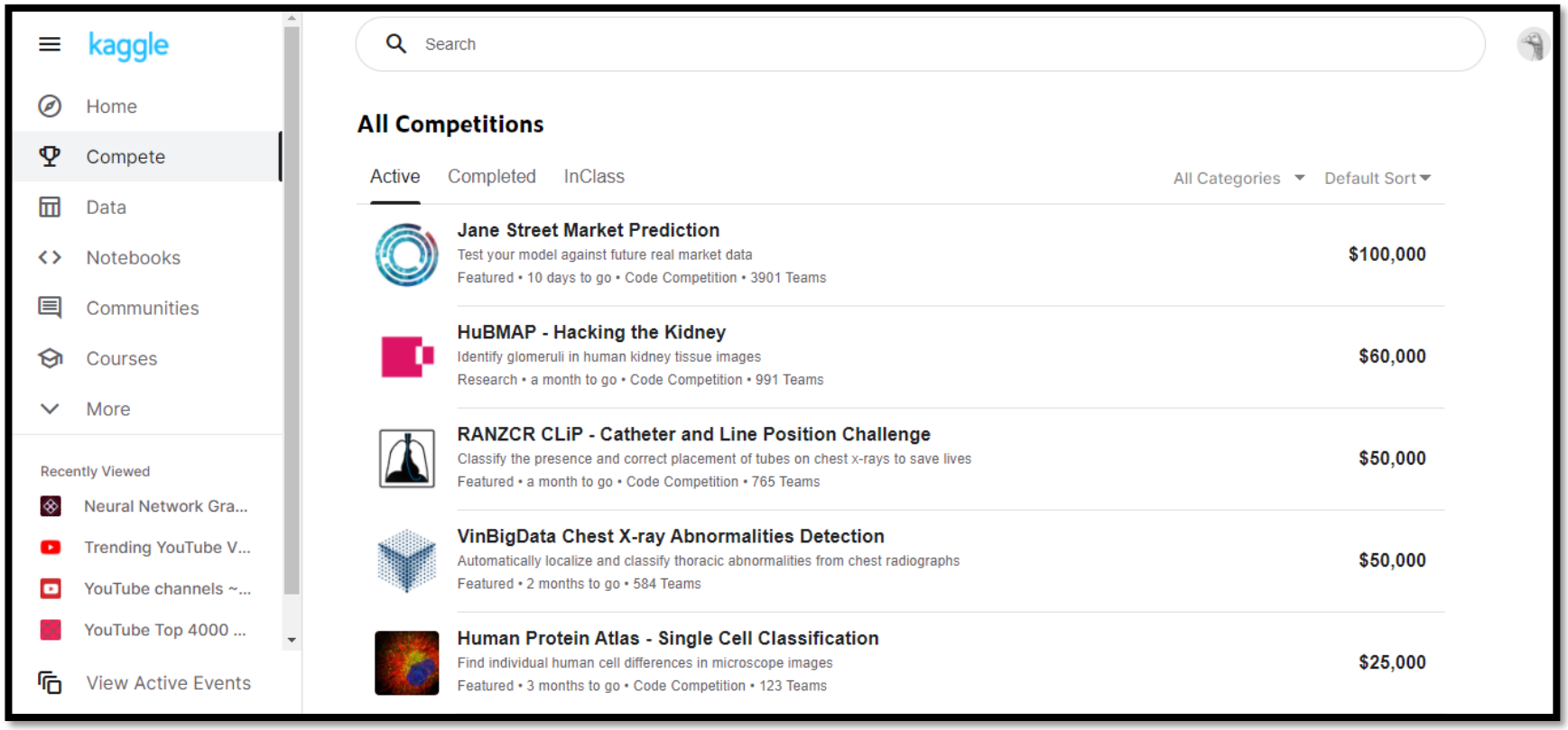
Lecture Schedule

- Watch assigned videos before the lecture
- During lecture
  - Teach something new (usually 1 hour) or invited speakers
    - Not directly related to assignments
  - Assignment announcement by TA
  - We will usually finish the lectures before 6:20 p.m.
- You can complete this course online.

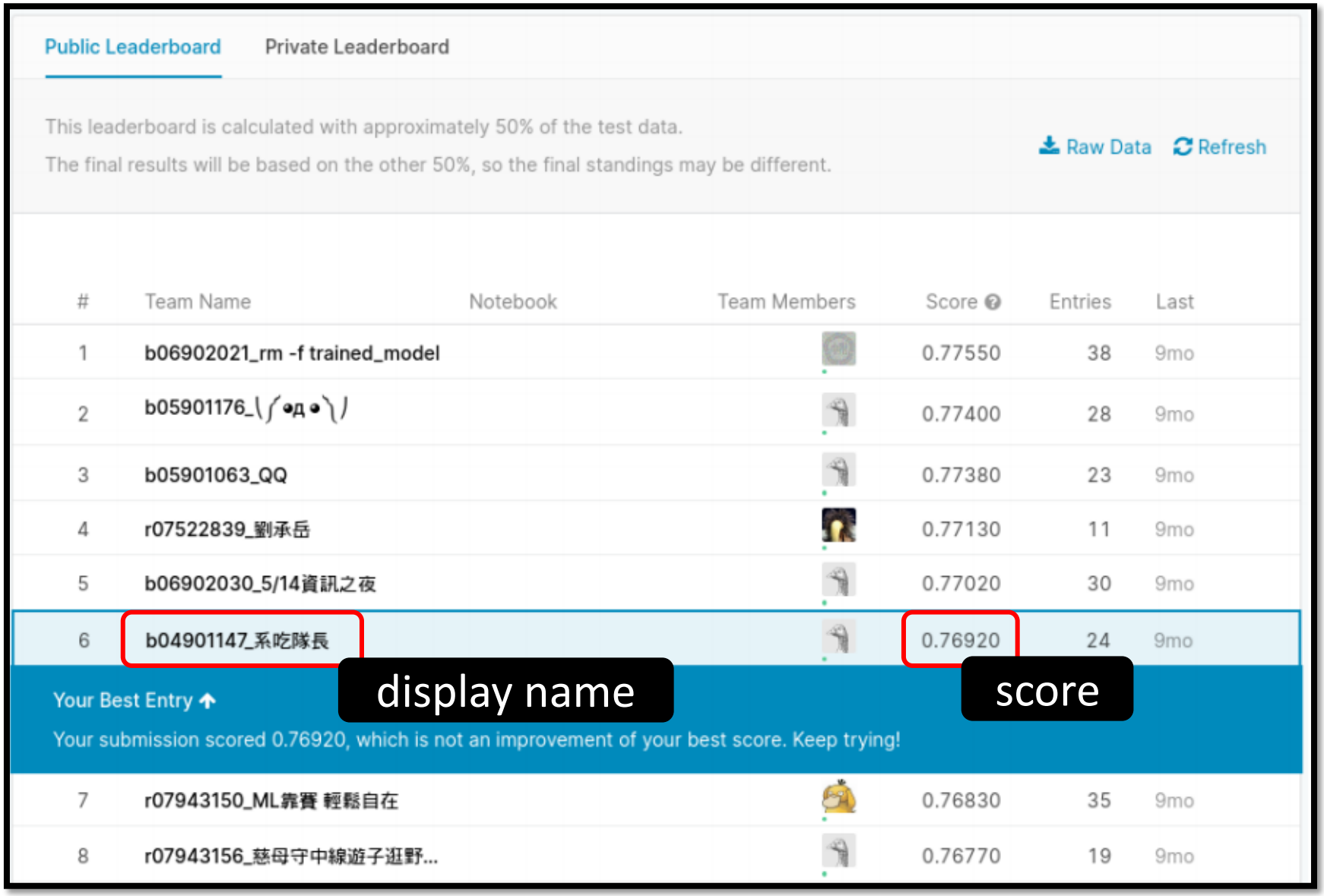
Kaggle

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!
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

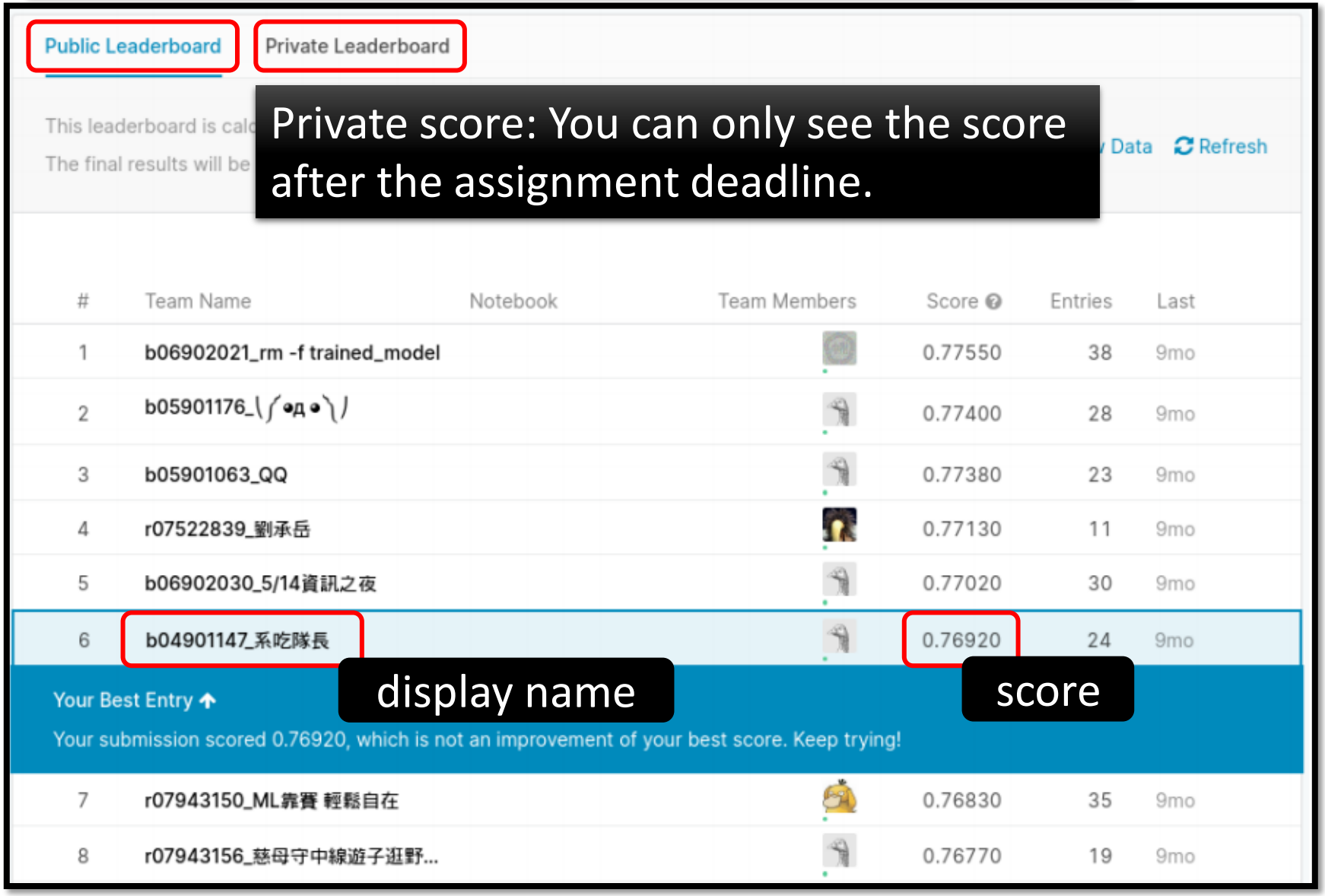
<STUDENT ID>_<ANY THING>

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 – Pokémon & Digimon

Testing Data

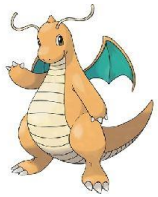
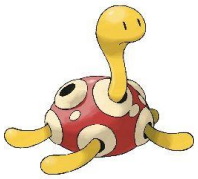
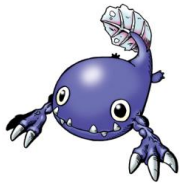
Given in the assignment

Ground truth

poki	poki	digi	poki	digi	digi

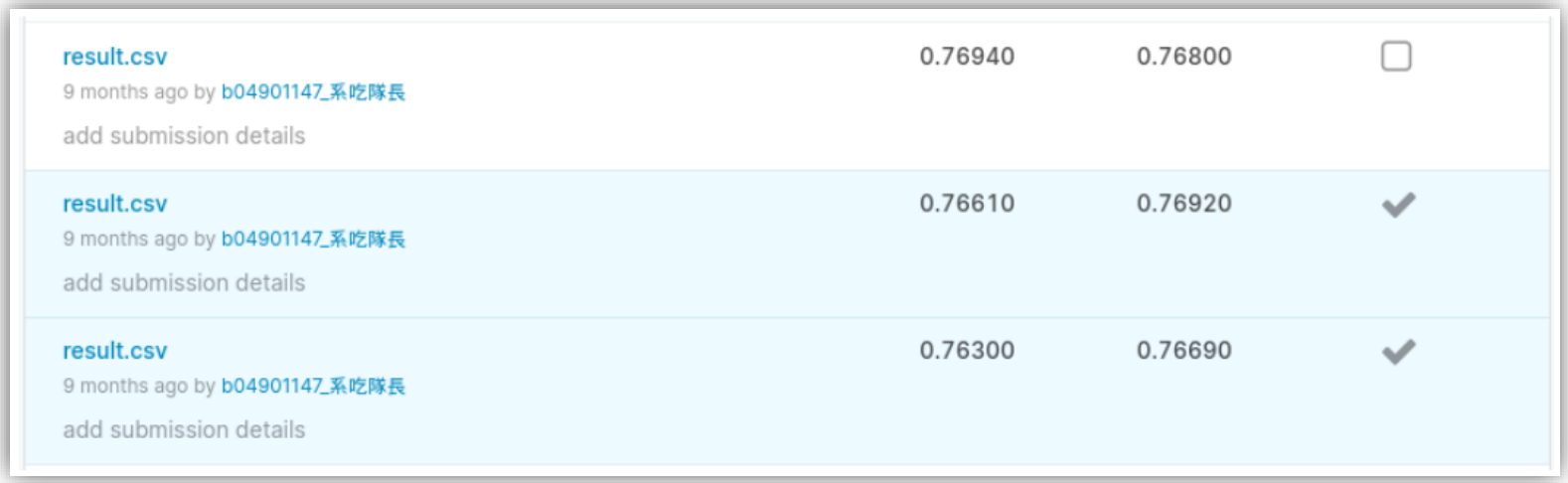
on Kaggle (unseen)

Kaggle – Pokémon & Digimon

	public			private		
						
Ground truth	poki	poki	digi	poki	digi	digi
Model Prediction	poki	digi	digi	digi	digi	poki
	Acc = 2/3			Acc = 1/3		
	What you can see immediately			After the submission deadline		

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.

Rules

Rules – Common Sense

- Don’t plagiarize others’ code and don’t submit others’ reports or results.
  - “***Other***” means *all creatures in the universe*
  - Using the available public toolkits is allowed.
  - If some of your codes are from others’ repositories, please mention them in your code.
  - If you discuss your assignments with some classmates/friends, mention them in your code.
  - TAs and the lecturer decide plagiarization or not.

Rules – Common Sense

- 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 your results to leaderboards of previous courses.
  - **Don’t use any approach to increase the submission numbers**

Rules – For Kaggle and JudgeBoi

- The results submitted to the leaderboards should **only come from machines**.
  - Don’t label the testing data by humans (or any other approaches)!
- 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.
  - 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, and you receive zero score for the assignment you violate the rules.
- The **second time** you violate the rules.
  - Fail the course.

加簽

*輔系指事前核可的輔系

加簽

- 加簽電資學院(含輔系*、資料科學學程、智慧醫療學程)的學生
  - 請填寫 google 表單 (如果沒有要加簽就不要填、也不要幫其他人填)
  - 等一下大助教會公告表單連結
  - **表單填寫期限到下週三(2/23)午夜，逾時不候**
  - 之後會透過 NTU COOL 發授權碼

加簽

- 非電資學院的學生，依據作業一的 leaderboard 排名加簽 (等一下助教會公告作業一)
  - **也請填寫 google 表單**
  - 根據 private leaderboard 排名取前 30 名非電資學院學生獲得加簽資格
    - 不看 public leaderboard
    - 只看排名不看分數
  - 不遞補
  - 之後會透過 NTU COOL 發授權碼
- 無論是否為電資學院的學生，完成作業一都可以計入期末總分

旁聽

- 本課程歡迎旁聽
- 課程內容和作業內容都已經完整公開在課程網頁上，有沒有正式修課對於學習影響不大
- 旁聽生請寄信給助教，可以加入 NTU COOL
- 旁聽生可以上傳結果到 Kaggle (但無法上傳到 JudgeBoi)
- 助教不批改旁聽生的報告

Questions?

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: mlta-2022-spring@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.

TA head **陳子晴**

TA email: mlta-2022-spring@googlegroups.com