



# Selected Topics in Visual Recognition using Deep Learning

## Homework 1 announcement

TA: 楊証琨, Jimmy

Ph.D. student at National Taiwan University

[d08922002@csie.ntu.edu.tw](mailto:d08922002@csie.ntu.edu.tw)

# HW1 Timeline

- **Deadline: Nov. 4, 23:59**
  1. Finish the [competition](#) (your ID on the leaderboard)

Results					
#	User	Entries	Date of Last Entry	Team Name	Accuracy ▲
1	ChenHsuanTai	1	10/07/21	baseline	0.65579 (1)

2. Upload your reports **in PDF format** to [E3 system](#)
  - Naming rule: VRDL\_HW1\_{**STUDENT ID**}\_Report.pdf



# HW1 Introduction: Bird images classification

- 6,033 bird images belonging to 200 bird species, e.g., tree sparrow or mockingbird (training: 3,000, test: 3,033)
- External data is **NOT** allowed to train your model!

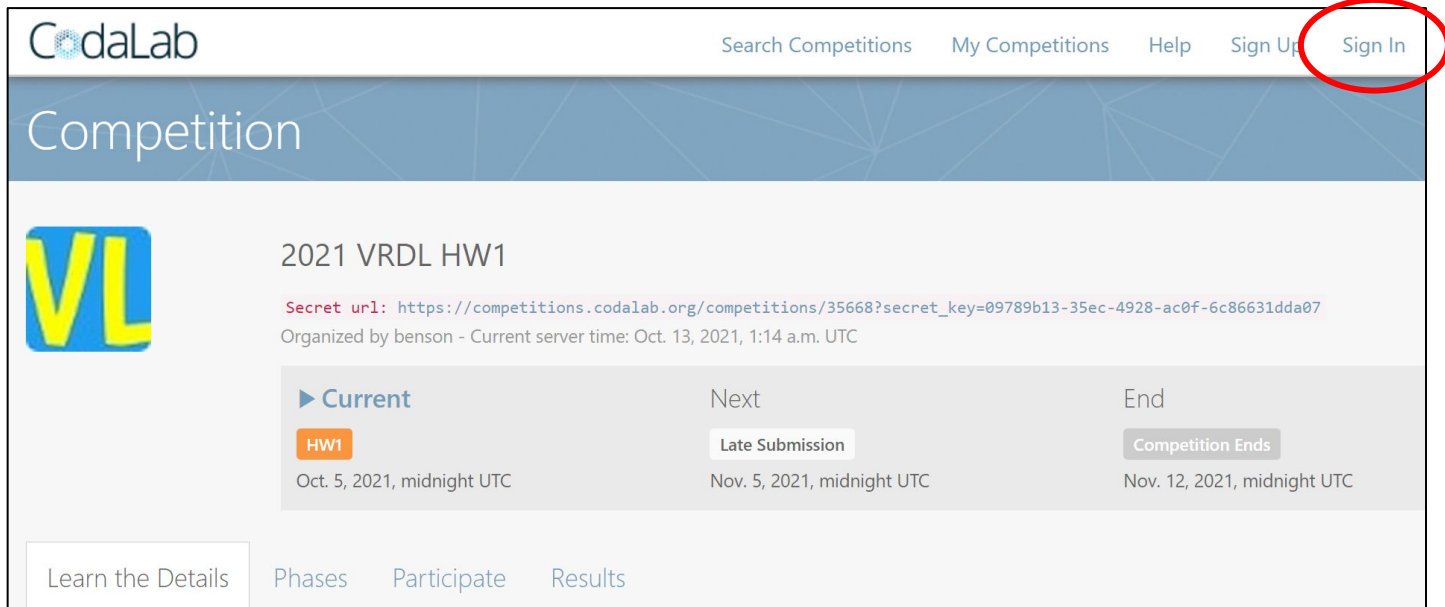


# HW1 CodaLab competition: Sign In

- HW 1 competition link:

[https://competitions.codalab.org/competitions/35668?secret\\_key=09789b13-35ec-4928-ac0f-6c86631dda07](https://competitions.codalab.org/competitions/35668?secret_key=09789b13-35ec-4928-ac0f-6c86631dda07)


- **Sing In** first! (Create an account if you don't have one)



CodaLab

Search Competitions My Competitions Help Sign Up **Sign In**

## Competition



### 2021 VRDL HW1

**Secret url:** [https://competitions.codalab.org/competitions/35668?secret\\_key=09789b13-35ec-4928-ac0f-6c86631dda07](https://competitions.codalab.org/competitions/35668?secret_key=09789b13-35ec-4928-ac0f-6c86631dda07)

Organized by benson - Current server time: Oct. 13, 2021, 1:14 a.m. UTC

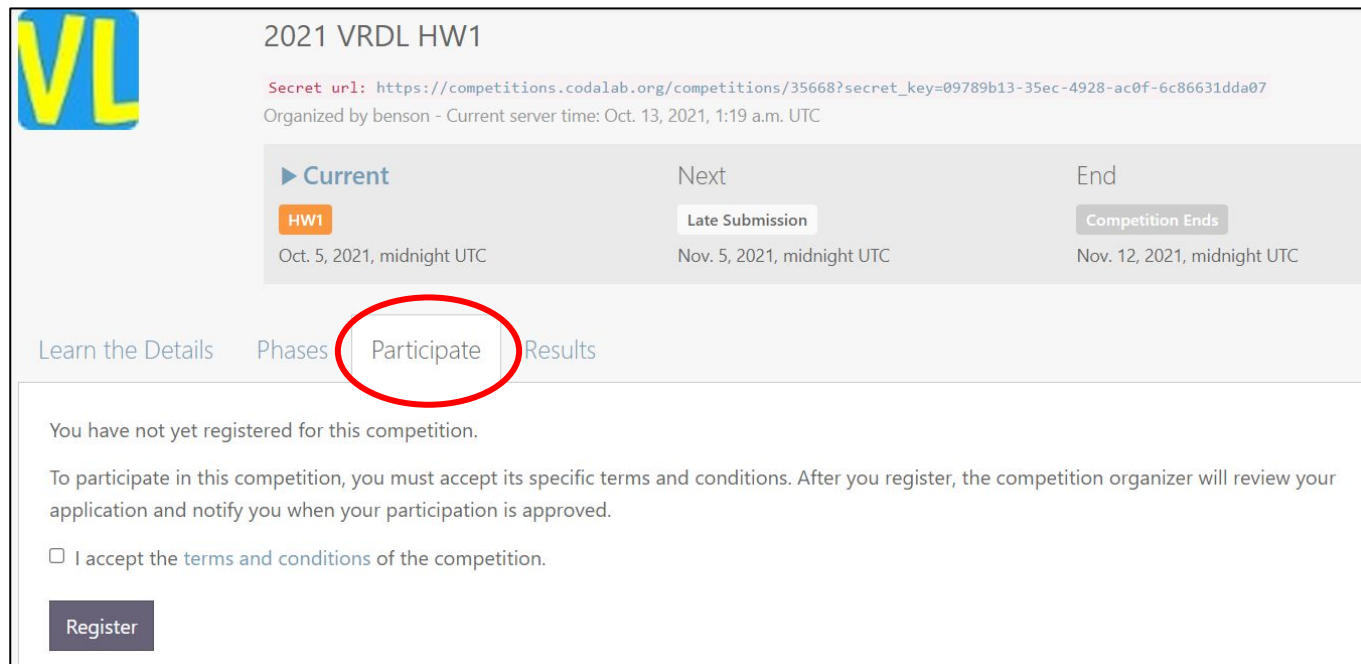
Current	Next	End
<b>HW1</b>	Late Submission	Competition Ends
Oct. 5, 2021, midnight UTC	Nov. 5, 2021, midnight UTC	Nov. 12, 2021, midnight UTC

[Learn the Details](#) [Phases](#) [Participate](#) [Results](#)



# HW1 CodaLab competition: Participate

- Participate the competition



**2021 VRDL HW1**

**Secret url:** [https://competitions.codalab.org/competitions/35668?secret\\_key=09789b13-35ec-4928-ac0f-6c86631dda07](https://competitions.codalab.org/competitions/35668?secret_key=09789b13-35ec-4928-ac0f-6c86631dda07)

Organized by [benenson](#) - Current server time: Oct. 13, 2021, 1:19 a.m. UTC

Current	Next	End
<b>HW1</b>	Late Submission	Competition Ends
Oct. 5, 2021, midnight UTC	Nov. 5, 2021, midnight UTC	Nov. 12, 2021, midnight UTC

[Learn the Details](#) [Phases](#) **[Participate](#)** [Results](#)

You have not yet registered for this competition.

To participate in this competition, you must accept its specific terms and conditions. After you register, the competition organizer will review your application and notify you when your participation is approved.

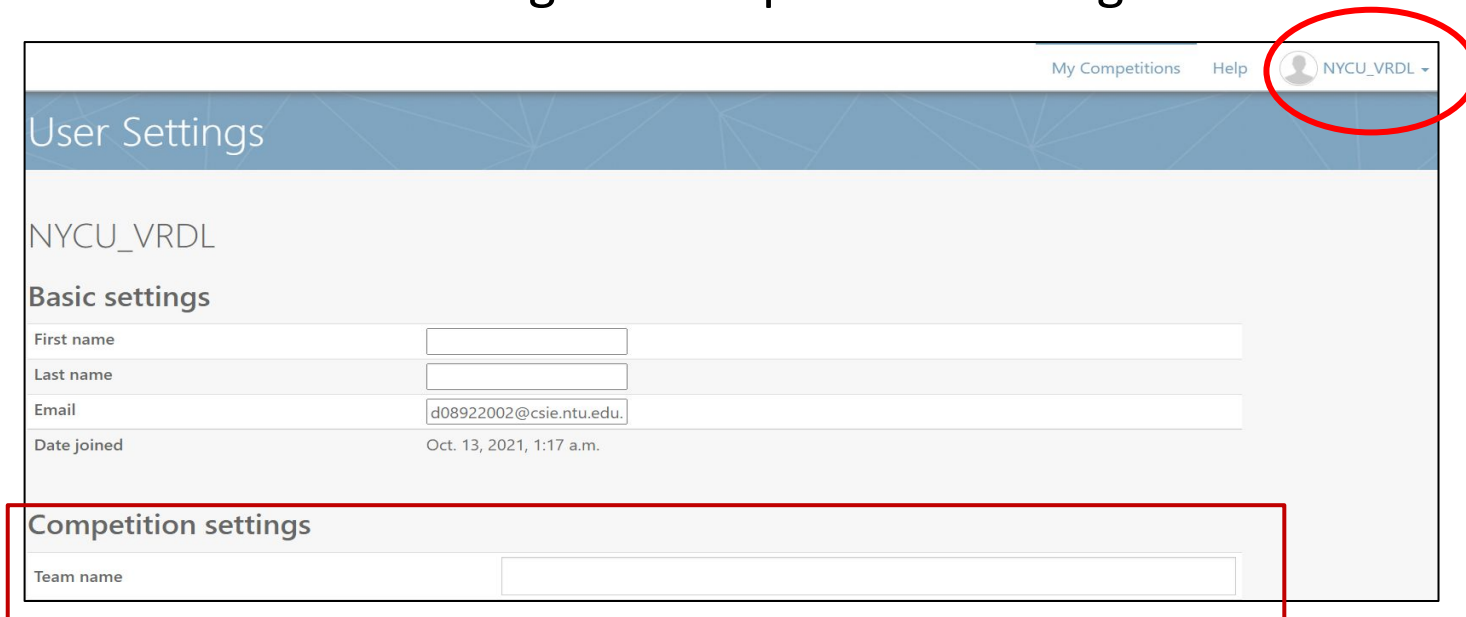
☐ I accept the [terms and conditions](#) of the competition.

[Register](#)



# HW1 CodaLab competition: Team name

- Change your team name into your **Student ID!**
  - Account -> Settings -> Competition settings -> Team name



My Competitions Help NYCU\_VRDL

## User Settings

NYCU\_VRDL

### Basic settings

First name	<input type="text"/>
Last name	<input type="text"/>
Email	<input type="text" value="d08922002@csie.ntu.edu."/>
Date joined	Oct. 13, 2021, 1:17 a.m.

### Competition settings

Team name	<input type="text"/>
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# HW1 CodaLab competition: Download dataset

- Download the provided dataset
  - Participate -> Files -> Public Data

► **Current**

**HW1**

Oct. 5, 2021, midnight UTC

Next

Late Submission

Nov. 5, 2021, midnight UTC

End

Competition Ends

Nov. 12, 2021, midnight UTC

Learn the Details

Phases

**Participate**

Results

Get Data

**Files**

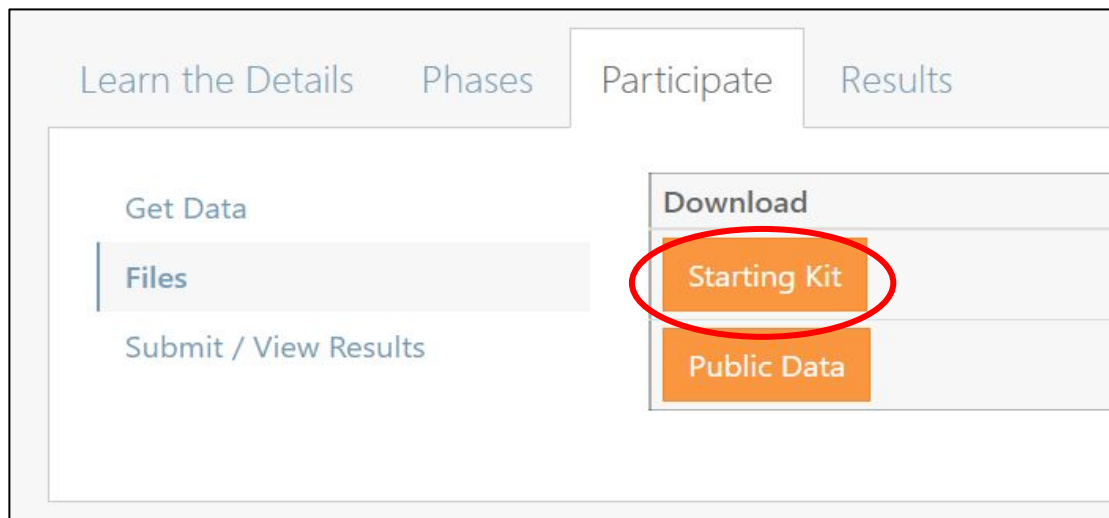
Submit / View Results

Download	Size (mb)	Phase
<b>Starting Kit</b>	0.016	#1 HW1
<b>Public Data</b>	646.789	#1 HW1



# HW1 CodaLab competition: Create submission

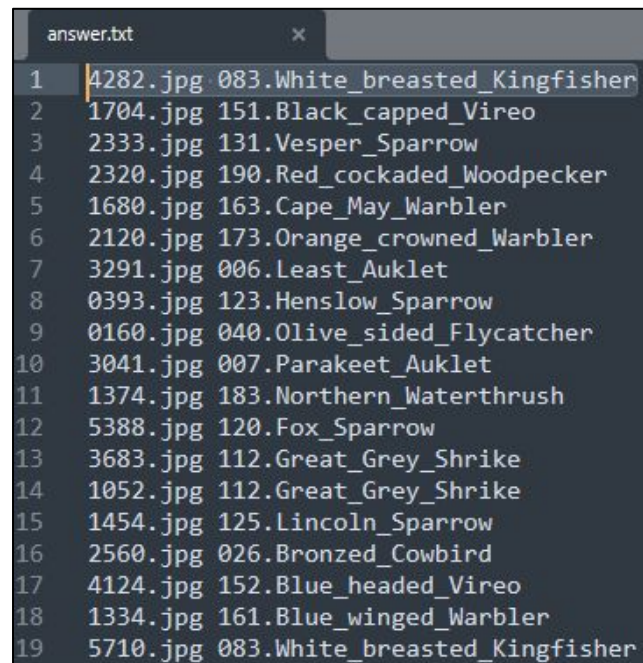
- We provide a sample submission file (.zip) and the pseudo code to generate the sample submission
  - Files -> Starting Kit





# HW1 CodaLab competition: Create submission

- The submission file is a single .txt file **compressed in zip**
- The .txt file should be named as **answer.txt**



# HW1 CodaLab competition: Submit results

- Upload your submission and see the performance on Results!
  - Participate -> Submit / View Results

Learn the Details

Phases

Participate

Results

Get Data

Files

Submit / View Results

HW1

Late Submission

Phase description

The due for Homework 1 is at midnight on october 28, 2021. Remember to submit your report to E3 system.

Max submissions per day: 5

Max submissions total: 9999

Click the Submit button to upload a new submission.

Optionally add more information about this submission

Submit

Here are your submissions to date (✓ indicates submission on leaderboard):



# HW1 CodaLab competition: Submit results

- If your submission format is correct, you should get the score in few minutes. Otherwise, view the scoring output/error log

Here are your submissions to date (✓ indicates submission on leaderboard):

#	SCORE	FILENAME	SUBMISSION DATE	STATUS	✓	
1	0.576327	sample_submission.zip	10/13/2021 01:32:26	Finished	✓	—

Description:

update description

[Download your submission](#)

[View scoring output log](#)

[View scoring error log](#)

[Download output from scoring step](#)

Remove from Leaderboard



# HW1 CodaLab competition: Leaderboard

- Do your best and beat the baseline!

[Learn the Details](#) [Phases](#) [Participate](#) [Results](#)

HW1


Late Submission

Phase description

The due for Homework 1 is at midnight on october 28, 2021. Remember to submit your report to E3 system.

Max submissions per day: 5

Max submissions total: 9999

 Download CSV

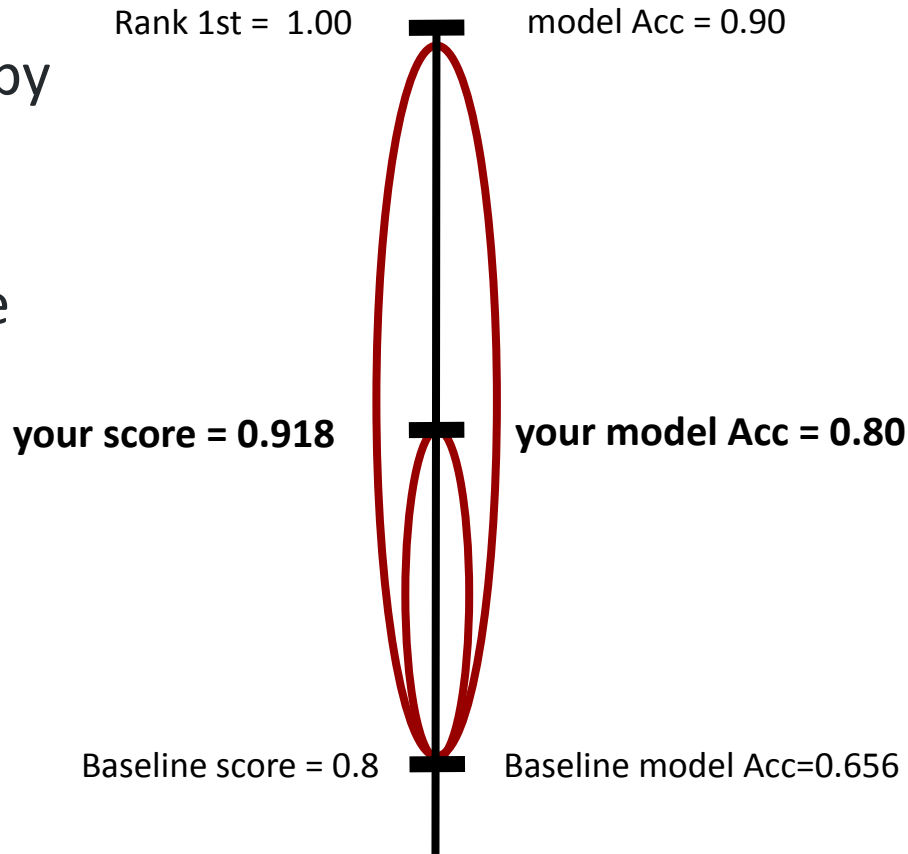
Download all submissions on leaderboard

Results					
#	User	Entries	Date of Last Entry	Team Name	Accuracy ▲
1	ChenHsuanTai	1	10/07/21	baseline	0.65579 (1)



# Grading policy: Model performance (70 points)

- Get at least 56 points ( $70 \times 0.8$ ) by scoring over the baseline
- Your score will be interpolated with the model accuracy by the 1st rank and the baseline



# Grading policy: Reports (20 points)

- Document your work (in PDF)
  - GitHub/ GitLab link of your code
  - **Reference if you used any code from other resources**
  - Brief introduction
  - Methodology (Data pre-process, Model architecture, Hyperparameters, ...)
  - Summary
- **Meet requirements above can get 80% of the points (16 points)**



# Reports bonus

- Thorough experimental results
- Comprehensive related work survey
- Interesting findings or summary
- Good example: [Kayo Yin](#)

## Anti-aliasing

Most modern convolutional networks, such as ResNet18, are not shift-invariant. The network outputs can change drastically with small shifts or translations to the input. This is because the striding operation in the convolutional network ignores the Nyquist sampling theorem and aliases, which breaks shift equivariance.

I decided to apply an anti-aliasing method proposed in the recent April 2019 paper: “Making Convolutional Networks Shift-Invariant Again”. This is done by simply adding a “BlurPool” layer, that is a blurring filter and a subsampling layer, after the convolution layers of



# Code readability (10 points)

- Write beautiful Python code with [PEP8 guidelines](#) for readability
- Must provide a downloadable **link of your model** and a **inference.py** to reproduce your submission file
  - Get only half points of **model performance** if fail on reproducing your submission

## Reproducing Submission

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To reproduct my submission without retrainig, do the following steps:

1. [Installation](#)
2. [Download Official Image](#)
3. [Make RGBY Images](#) for official.
4. [Download Pretrained models](#)
5. [Inference](#)
6. [Make Submission](#)





# Code readability bonus

- Clear structure and README of all your steps to reproduce the submission
- Good example:

<https://github.com/paperswithcode/releasing-research-code>

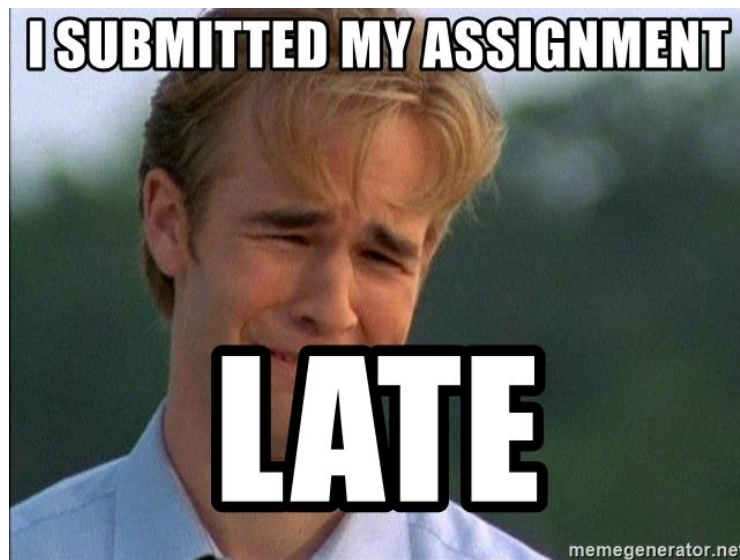
The ML Code Completeness Checklist consists of five items:

1. Specification of dependencies
2. Training code
3. Evaluation code
4. Pre-trained models
5. README file including table of results accompanied by precise commands to run/produce those results



# Late policy

- We will deduct a late penalty of 20% per additional late day
- For example, If you get 90% of HW1 but delay for two days, your will get only  $90\% - (20\% \times 2) = 50\%$ !



# Keywords

- Beat the baseline
  - Data preprocess (normalization), Data augmentation, Proper hyperparameter setting (learning rate, optimizer)
  - ResNet-50
- Rank Top 3!
  - Transfer learning, learning rate schedule, Model ensemble, Hyperparameter tuning, Hard negative mining, ...
  - Google ******fine-grained image classification******



# FAQ

- Can I use any code/tools/Library from GitHub or other resources?
  - Yes! We encourage you to learn how to apply existing tools on your own task, such as Keras: applications, Pytorch: torchvision, TensorFlow: model zoo
- DO NOT copy code from your classmate!**
- Pre-trained model is **usable** for this homework
- How to deal with GPU Out-Of-Memory (OOM) errors?
  - Lower your image size / batch size or use smaller network
- Which score will be used if I submit multiple predictions
  - Only the highest one will be used to grade your homework



# Notice

- Check your email regularly, we will mail you if there are any updates or problems of the homework
- If you have any questions or comments for the homework, feel free to mail me and cc Prof. Lin or post it on E3 forum
  - Prof. Lin: [lin@cs.nctu.edu.tw](mailto:lin@cs.nctu.edu.tw)
  - TA Jimmy: [d08922002@csie.ntu.edu.tw](mailto:d08922002@csie.ntu.edu.tw)
  - TA 柏聲: [benonliu0904@gmail.com](mailto:benonliu0904@gmail.com)
  - TA 晨軒: [derekt.cs06@nctu.edu.tw](mailto:derekt.cs06@nctu.edu.tw)
  - TA Cheng-Ju: [ace52751208@gmail.com](mailto:ace52751208@gmail.com)



# Have fun!

