

FIT2004

Algorithms and Data Structures

Ian Wern Han Lim
lim.wern.han@monash.edu

Referencing materials by
Nathan Companez, Aamir Cheema, Arun Konagurthu and Lloyd Allison



Faculty of Information Technology, Monash University

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Ready?

Agenda

- Introduction
 - The unit
 - The classes
 - The assessments

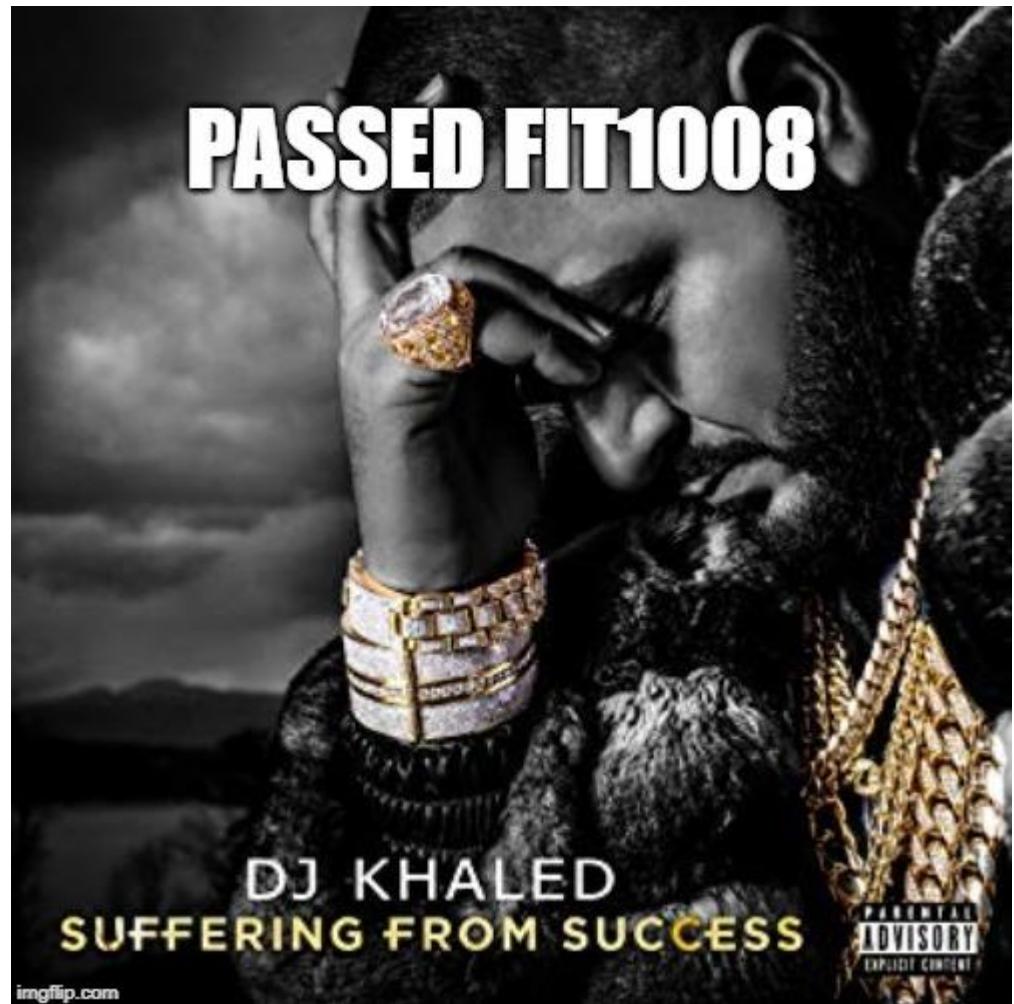
Let us begin...

Welcome to FIT2004



- So what brings you to FIT2004?

- So what brings you to FIT2004?



Welcome to FIT2004

- As promised
every semester



- This is a very important unit



- This is a very very important unit

- This is a very very important unit

My first interview experience — Shopee Singapore Backend Engineer (2020)



Kai Yi Tan · Jan 17 · 11 min read



A screenshot of Kai Yi Tan's LinkedIn profile. It features a circular profile picture of him in a black shirt, a grey header bar with his name, and a light blue main area. At the bottom, there are buttons for 'Message' and 'More...'.

Kai Yi Tan · 1st

Backend Engineer at Shopee

Selangor, Malaysia · 109 connections · [Contact info](#)



Shopee



Monash University Malaysia



- This is a very very very important unit

- This is a very very very important unit
 - The **core** unit to computer science
 - “This is the **COREST of CORE** unit in your degree” – A/Prof Arun
 - Ex-course coordinate of the BCS
 - Ex-CE of the unit
 - CE of FIT3155 Advance Algorithms and Data Structures

- This is a very very very important unit
 - The **core** unit to computer science
 - Expect the **FANG** companies to interview you on the unit...
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- This is a very very very important unit
 - The **core** unit to computer science
 - Expect the **FANG** companies to interview you on the unit...
 - Facebook
 - Amazon and Apple
 - Netflix
 - Google
 - “This is the **COREST of CORE** unit in your degree” – A/Prof Arun
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Celestine Omin
@cyberomin

I was just asked to balance a Binary Search Tree by JFK's airport immigration. Welcome to America.

12:26 AM - 27 Feb 2017 · Manhattan, NY

◀ 8,754 ❤ 7,447



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8,754 7,447

1 hour ago

@Ian Lim (lecturer) forgot to mention that I finally realize just how important 2004 is haha. While interviewing for an internship, one of the companies actually gave me a similar question to the first assignment we did last sem. Just had to copy paste and change a bit 😅

Questions?

Algorithms and Data Structures

What is it?



Algorithms and Data Structures

What is it?



- Think of it as cooking...

Algorithms and Data Structures

What is it?

- Think of it as cooking...



Algorithms and Data Structures

What is it?



- Think of it as cooking...
 - Algorithms are recipe to solve problems

Algorithms and Data Structures

What is it?



- Think of it as cooking...
 - Algorithms are recipe to solve problems
 - Short
 - Simple
 - Clear
 - Step-by-step

Algorithms and Data Structures

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Algorithms and Data Structures

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Algorithms and Data Structures

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 - Dice
 - Whole
 - Mince

Algorithms and Data Structures

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 - Some are better/ easier to cook certain things

Algorithms and Data Structures

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- Think of it as cooking...
 - Algorithms are recipe to solve problems
 - Short
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 - Data are the ingredients to your cooking
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 - Dice
 - Whole
 - Mince
 - Some are better/ easier to cook with
 - Data structures are how you prepare the ingredients
 - Durian
 - Brain
 - Network
 - Space



Algorithms and Data Structures

What is it?



- Think of it as cooking...
 - Algorithms are **recipe** to solve problems
 - Short
 - Simple
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 - Data are the **ingredients** to your cooking
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Questions?

Algorithms and Data Structures

What is it?



- To cook something, we have many ways

Algorithms and Data Structures

What is it?



- To cook something, we have many ways
 - We can boil everything (aka brute force)

Algorithms and Data Structures

What is it?



- To cook something, we have many ways
 - We can boil everything (aka brute force)
 - We can grill it (for example dynamic programming)

Algorithms and Data Structures

What is it?

- To cook something, we have many ways
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 - We can grill it (for example dynamic programming)
 - We can combine these techniques for more complex stuffs (like machine learning)

Algorithms and Data Structures

What is it?



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Algorithms and Data Structures

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 - And know how some recipes are **BAD**



Algorithms and Data Structures

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 - And know how some recipes are **BAD**
 - And know which recipe to use when needed (**fast vs yummy**)

Algorithms and Data Structures

What is it?



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 - Or even come up with your own recipe if you are good enough...

Algorithms and Data Structures

What is it?



Algorithms and Data Structures

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 - So it is good for us to learn various recipe, for various ingredients
 - And know how some recipes are **BAD**
 - And know which recipe to use when needed (**fast vs yummy**)
 - Or even come up with your own recipe if you are good enough...
 - Or to know what not to ever try...

Algorithms and Data Structures

What is it?



Questions?

Learning Outcomes

At the end of the unit...

Learning Outcomes

At the end of the unit...

1. Analyze general **problem-solving strategies** and algorithmic paradigms, and apply them to solving new problems;
2. Prove **correctness** of programs, analyze their **space and time complexities**;
3. **Compare** and **contrast** various abstract data types and use them appropriately;
4. Develop and **implement algorithms** to solve computational problems.

Learning Outcomes

At the end of the unit...

- All of your assessment
 - Tutorial/ studio preparation
 - Assignment
 - Exam

Why should I hire a software engineer if I can just copy and paste code from Stack Overflow?



Jessica Su, CS PhD student at Stanford



Answered Dec 28 · Upvoted by Rupak Hattikudur, Software Engineer @ L&T Infotech and Terry Lambert, Senior Software Engineer: Novell, Artisoft, IBM, Array Netw...

It's still worth the money. The breakdown is

- Copying code from StackOverflow:
\$1
- Knowing which code to copy from StackOverflow: \$100000/year

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- Knowing which code to copy from StackOverflow: \$100000/year

Because now you know what recipe to look for and make sense

Questions?

Introduction

About me?

- Wern Han LIM, just call me Ian
- lim.wern.han@monash.edu
- Room 2-4-21
- BCS graduate 2009
- Gone through this before
(before the unit was nerfed)

Introduction

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Introduction

About me?

- Wern Han LIM, just call me Ian
- lim.wern.han@monash.edu
- Room 2-4-21
- **Feel free to contact me**
(more on that later)
- BCS graduate 2009
- Gone through this before
(before the unit was nerfed)



Introduction

About me?

- Tutor for the unit since 2014 when it was redeveloped
- Lecturer for the unit since 2018
- Been packaged to MUA k-times for marking

- Also had experienced in
 - FIT 1008 Introduction to Computer Science
 - FIT 3155 Advanced Algorithms and Data Structures
 - FIT 2014 Theory of Computation
 - FIT 3140 Advanced Programming
 - FIT 3152 Data Analytics

Introduction

About me?

- Do have speech impairment, so please do interrupt me
 - Ask me to repeat
 - Ask me to spell
 - Ask me to write
- Faculty teaching award 2017
- Monash Student Association (MSA in MUA) 2018 teaching award (Faculty of IT)
- Faculty teaching excellence 2019
- PVC teaching excellence 2020

Questions?

Introduction

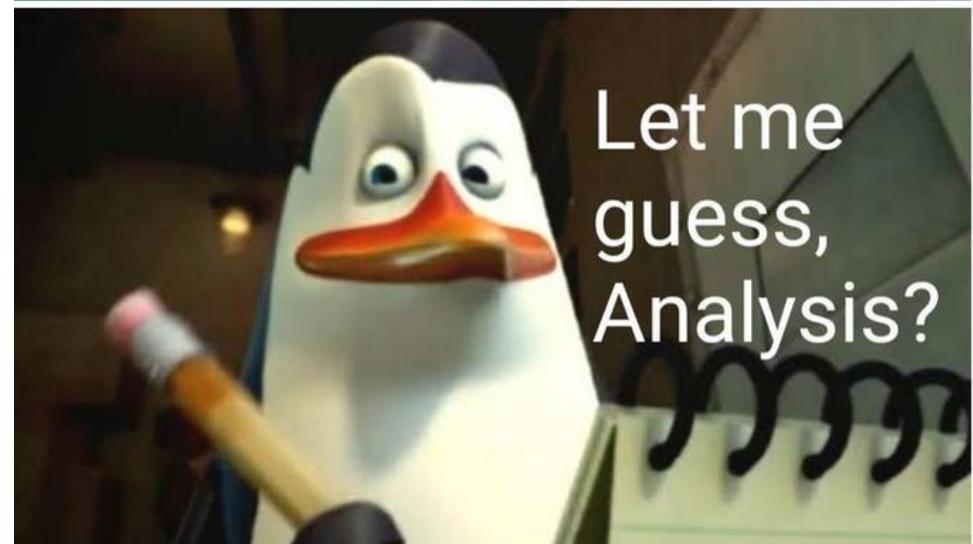
The Topics

- Now let us go through the topic one by one

Introduction

The Topics

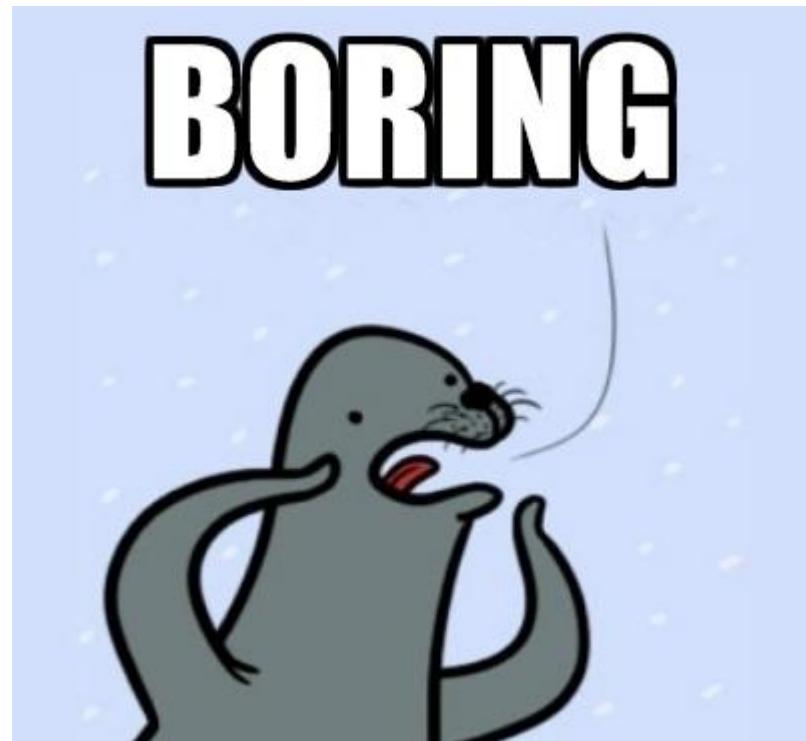
- Analysis of algorithms
 - Correctness
 - Complexity
 - Finding
 - Proving



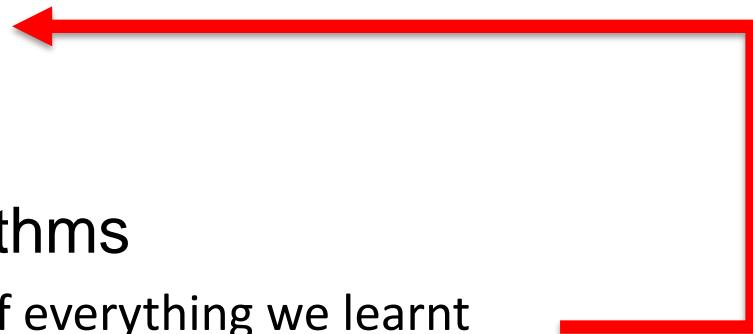
Introduction

The Topics

- Analysis of algorithms
 - Correctness
 - Complexity
 - Finding
 - Proving

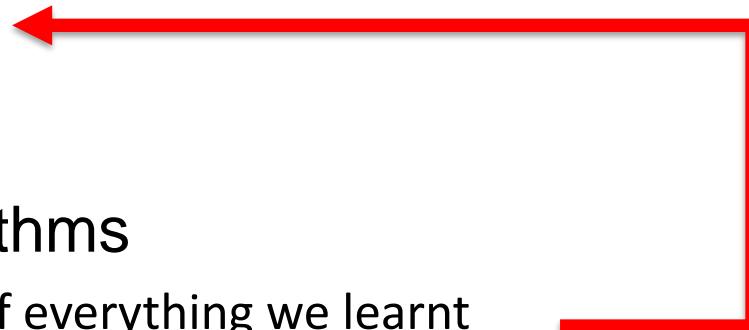


- Analysis of algorithms
 - Correctness
 - Complexity
- Sorting algorithms
 - Quick recap of everything we learnt



- Analysis of algorithms

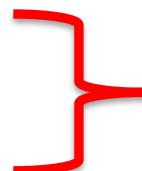
- Correctness
 - Complexity



- Sorting algorithms

- Quick recap of everything we learnt
 - Also new better ones
 - Counting sort
 - Radix sort

- Analysis of algorithms
 - Correctness
 - Complexity
- Sorting algorithms
 - Quick recap of everything we learnt
 - Also new better ones
 - Counting sort
 - Radix sort



Assignment 01

Introduction

The Topics

- Dynamic programming
 - Analyzing it from time/ space complexity

Introduction

The Topics

- Dynamic programming
 - Analyzing it from time/ space complexity
 - This is your **Assignment 02** as well

Introduction

The Topics

- Dynamic programming
 - Analyzing it from time/
space complexity
 - This is your **Assignment 02** as well
 - Also useful in the future...

SH Shawn Hoong
... typing

> Need to spend company's reward points of 100 points 15:40

> Can claim steam codes with cost/value 6, 12, 24, 60 15:40

> Can claim razer gold to steam code of 10 points to rm 10 razer, razer rm 11.60 to steam rm 10 15:41

Online 0/1 Knapsack problem solver

Using dynamic programming with javascript [Read about it at wikipedia](#) [YouTube video](#)

capacity	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
no items	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
delete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
value=60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
weight=60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
value=12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
weight=12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
value=24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
weight=24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
value=6	0	0	0	0	0	0	6	6	6	6	6	12	12	12	12	12	12	12	12	12	
weight=6	0	0	0	0	0	0	6	6	6	6	6	12	12	12	12	12	12	12	12	12	
value=8.6	0	0	0	0	0	0	6	6	6	6	8.6	8.6	12	12	12	12	12	12	12	12	
weight=10	0	0	0	0	0	0	6	6	6	6	8.6	8.6	12	12	12	12	12	12	12	12	

Items in solution:
val=8.6 w=10
val=6 w=6
val=24 w=24
val=60 w=60
solution: 98.6

Add Item: Value: 12 Weight: 12 OK Delete all Items Reload demo Items New capacity knapsack size: 100 OK

GIF

> Use online knapsack problem solver 15:42

15:41

15:43

Thanks Monash Computer Science program 15:43

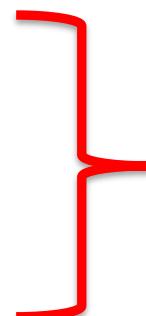
Introduction

The Topics

- Dynamic programming
 - Analyzing it from time/ space complexity
 - This is your **Assignment 02** as well
- Efficient lookup structure
 - How to search for item quickly (via key)

- Dynamic programming
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 - This is your **Assignment 02** as well
- Efficient lookup structure
 - How to search for item quickly (via key)
 - Hash tables
 - Binary Search Tree (BST)

- Dynamic programming
 - Analyzing it from time/ space complexity
 - This is your **Assignment 02** as well
- Efficient lookup structure
 - How to search for item quickly (via key)
 - Hash tables
 - Making good hash function
 - Cuckoo hashing
 - Binary Search Tree (BST)
 - AVL tree



Real world focus

Introduction

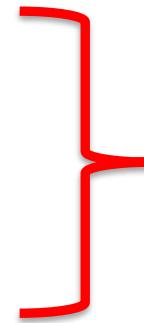
The Topics

- Pattern matching
 - Trie
 - Suffix array
 - Burrows-Wheeler's Transform (BWT)

Introduction

The Topics

- Pattern matching
 - Trie
 - Suffix array
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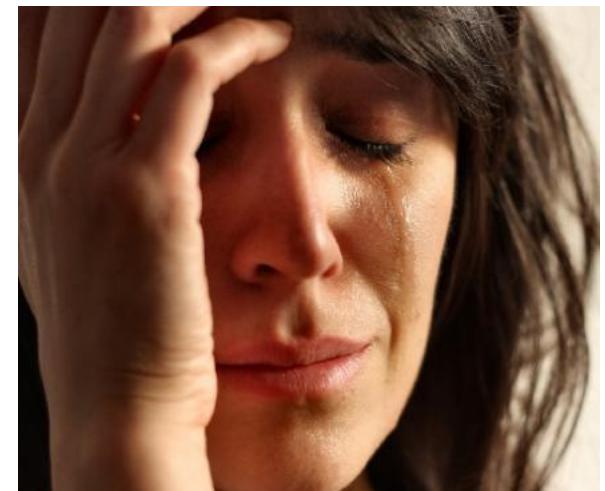
Assignment 03
(popular in exam)

Introduction

The Topics

- Pattern matching
 - Trie
 - Suffix array
 - Burrows-Wheeler's Transform (BWT)

- Traversal and shortest distance
 - The Graph data structure
 - A lot of algorithms here...



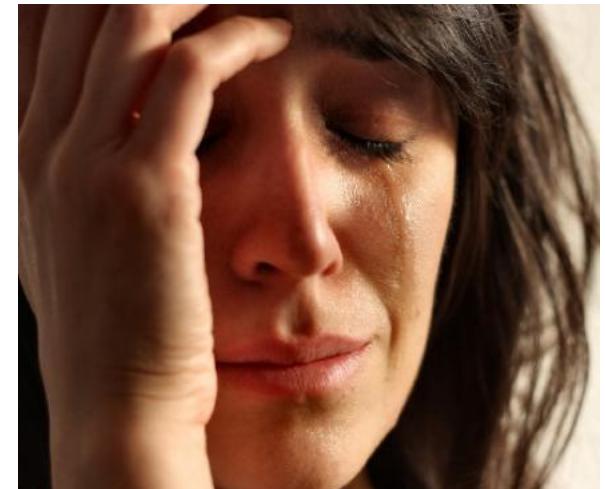
Introduction

The Topics

- Pattern matching
 - Trie
 - Suffix array
 - Burrows-Wheeler's Transform (BWT)

- Traversal and shortest distance
 - The Graph data structure
 - A lot of algorithms here...

Assignment 04



Introduction

The Topics

- Pattern matching
 - Trie
 - Suffix array
 - Burrows-Wheeler's Transform (BWT)
- Traversal and shortest distance
 - The Graph data structure
 - A lot of algorithms here...
 - And somehow, we can make trees from graph!
called Minimum Spanning Tree (MST)

Introduction

The Topics

- Pattern matching
 - Trie
 - Suffix array
 - Burrows-Wheeler's Transform (BWT)
- Traversal and shortest distance
 - The Graph data structure
 - A lot of algorithms here...
 - And somehow, we can make trees from graph!
called Minimum Spanning Tree (MST)
 - And we can build networks and optimize the flow!

Introduction

The Topics

- Every topic is important
- Every topic is examined
 - Assignment
 - Mid Semester Test (MST)
 - Exam

Introduction

The Topics

- Every topic is important
- Every topic is examined
 - Assignment
 - ~~Mid Semester Test (MST)~~
 - Exam

Questions?

Introduction

The Assessments

- Just now I mentioned 4 assignments...
 - They are worth 40%

- Just now I mentioned 4 assignments...
 - They are worth 40%
 - Week 4, 7, 9, 12

Introduction

The Assessments

- Just now I mentioned 4 assignments...
 - They are worth 40%
 - Week 4, 7, 9, 12
 - But subjected to change



Introduction

The Assessments

- 40% Assignments

Introduction

The Assessments

- 00% Lecture participation
- 10% Tutorial preparation + participation
- 40% Assignments
- 50% Final exam

Introduction

The Assessments

- 00% Lecture participation
- 10% Tutorial (studio) preparation + participation
- 40% Assignments
- 50% Final exam



Introduction

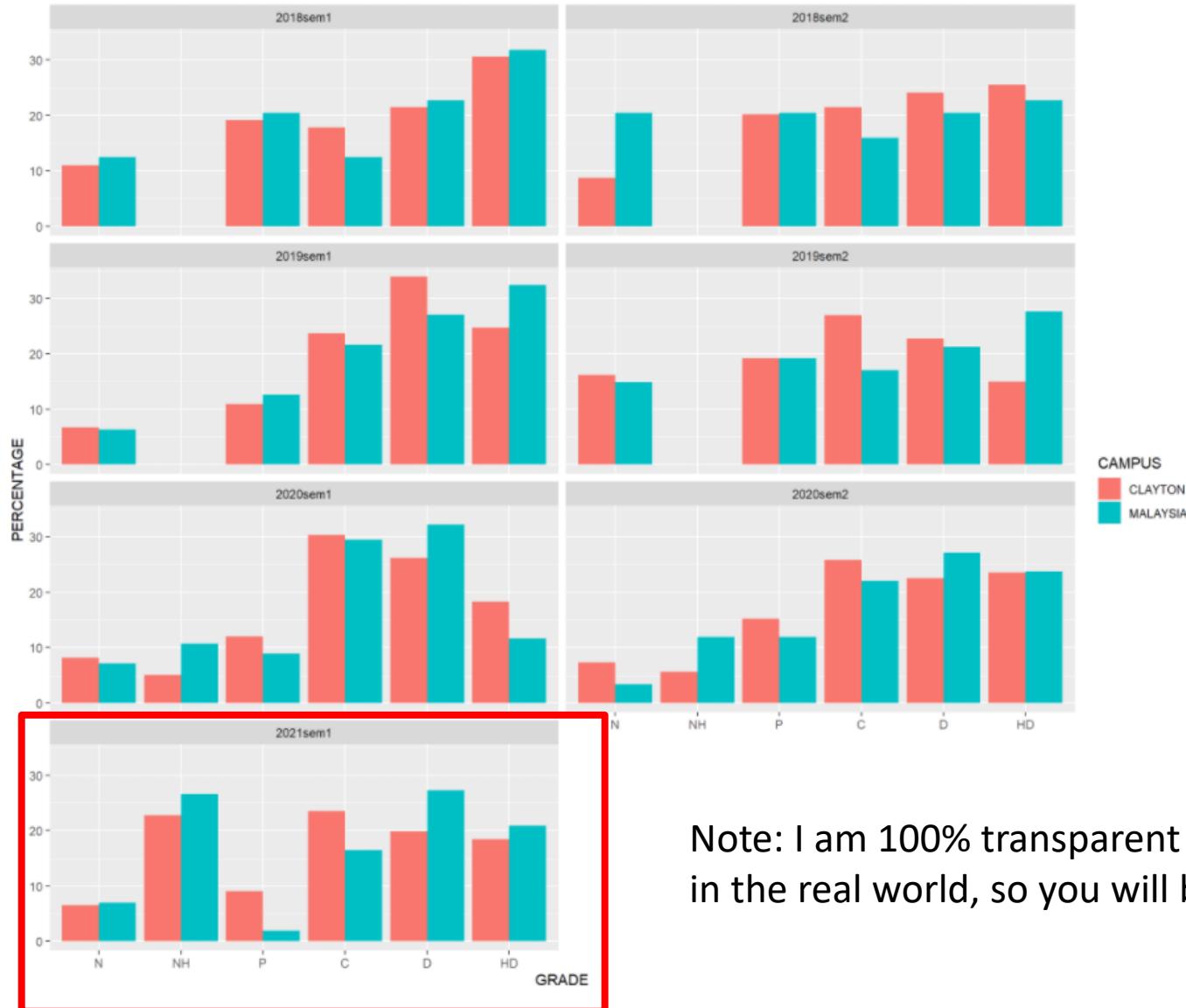
The Assessments

- 00% Lecture participation
 - Week 2 to Week 12
- 10% Tutorial (studio) preparation + participation
 - Week 2 to Week 12
- 4% Assignments
 - Week 4, 7, 9, 12
 - **3 weeks apart**
- 50% Final exam
 - After week 13



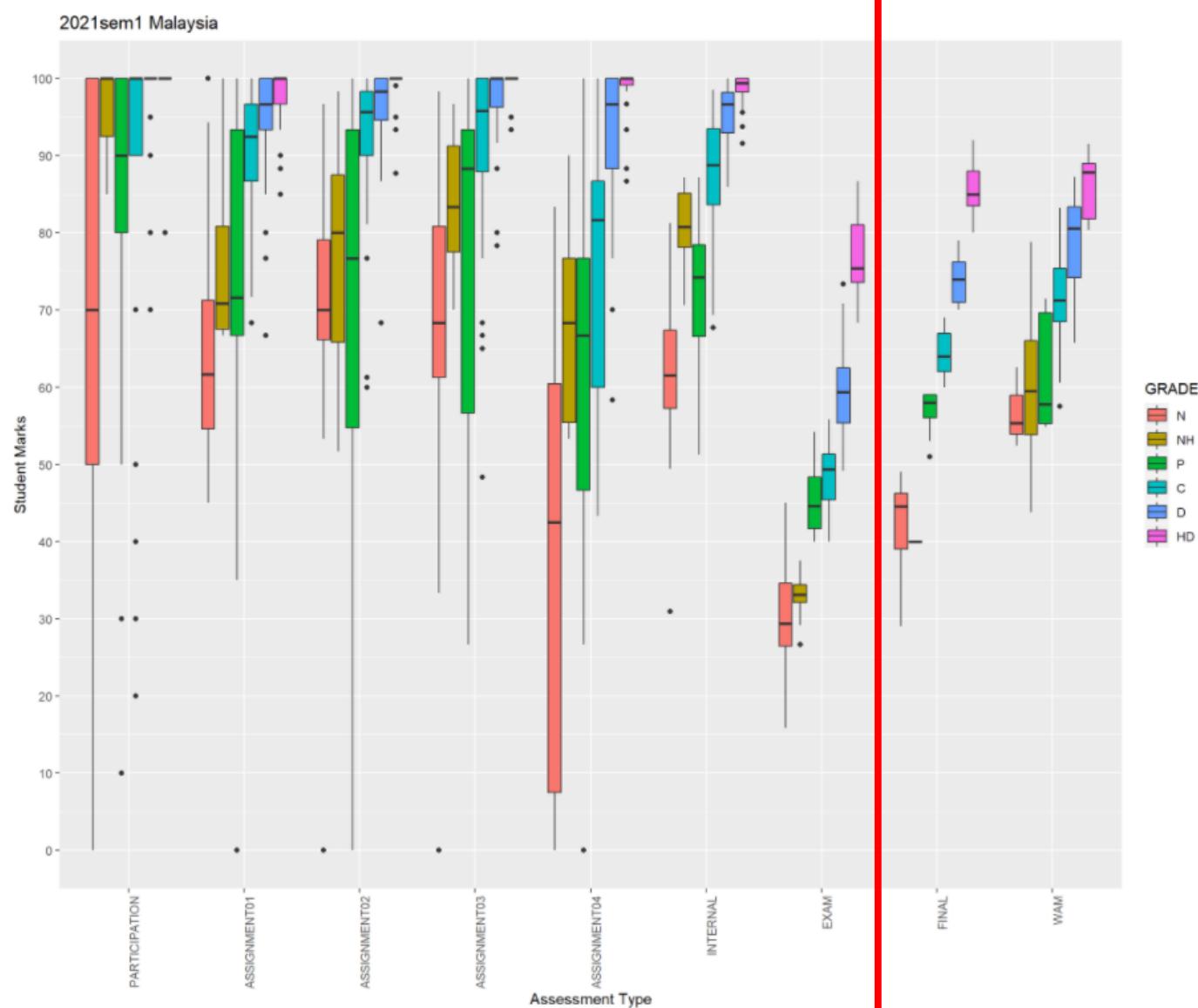
Questions?

How did everyone do?



Note: I am 100% transparent as how it is in the real world, so you will be a statistic

How did everyone do?



Questions?

Tutorial Participation

How is it like?

- 01% per week
- Pre-class activity
- In-class activity

Tutorial Participation

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Tutorial Participation

How is it like?

- 01% per week
- Pre-class activity
 - Submit a PDF on Moodle weekly
 - Submit it before **Moodle deadline**
- In-class activity

Tutorial Participation

How is it like?

- 01% per week
- Pre-class activity
 - Submit a PDF on Moodle weekly
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 - Doesn't need to be correct
 - Showed sufficient attempt and effort
 - This would act as your notes as well
- In-class activity

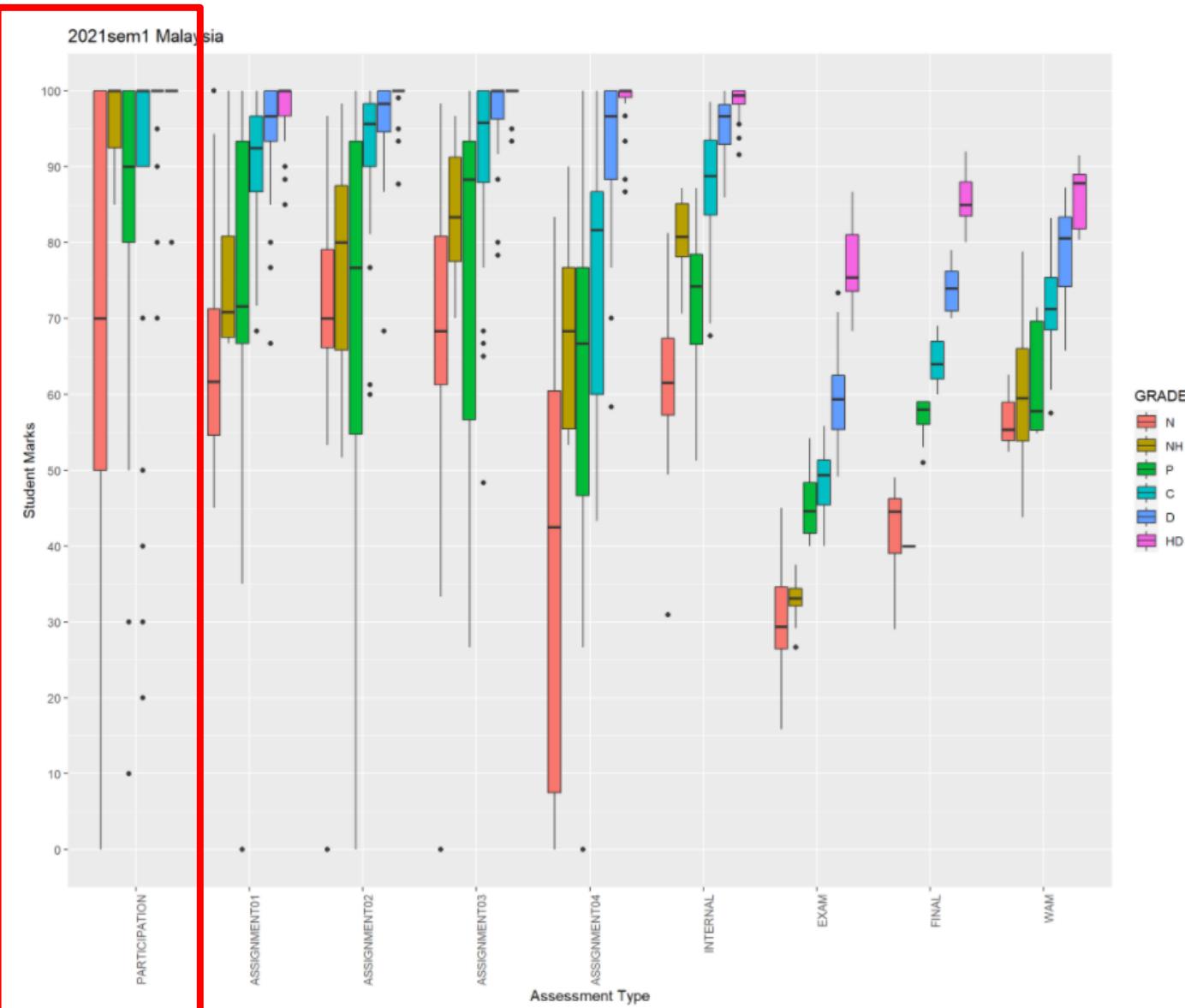
Tutorial Participation

How is it like?

- 01% per week
- Pre-class activity
 - Submit a PDF on Moodle weekly
 - Submit it before **Moodle deadline**
 - Doesn't need to be correct
 - Showed sufficient attempt and effort
 - This would act as your notes as well
- In-class activity
 - **Not possible anymore due to COVID**
 - Used to have a bunch of fun activities like coding challenges
(per interview questions but can't do it now)

Tutorial Participation

How is it like?



Questions?

Assignment

How is it like?

- How is it like?

Assignment

How is it like?

- How is it like?
 - Real world problem
 - You would solve it

Assignment

How is it like?

- How is it like?
 - Real world problem
 - You would solve it
 - Correctly
 - Efficiently

Assignment

How is it like?

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 - **Efficiently**

Assignment

How is it like?

- How is it like?
 - Real world problem
 - You would solve it
 - Correctly
 - Efficiently
 - Released around 2 weeks earlier

Assignment

How is it like?

- How is it like?
 - Real world problem
 - You would solve it
 - Correctly
 - Efficiently
 - Released around 2 weeks earlier
 - Submit on Moodle
 - Submit on Sunday
 - Submit by 11.55pm

Assignment

How is it like?

- How is it like?
 - Real world problem
 - You would solve it
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Assignment

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Melbourne time

Assignment

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 - Submit on ~~Sunday~~ Friday
 - Submit by 11.55pm
Melbourne time
 - Late submission at 10% penalty
up to 5 days maximum

Assignment

How is it like?

- How is it like?

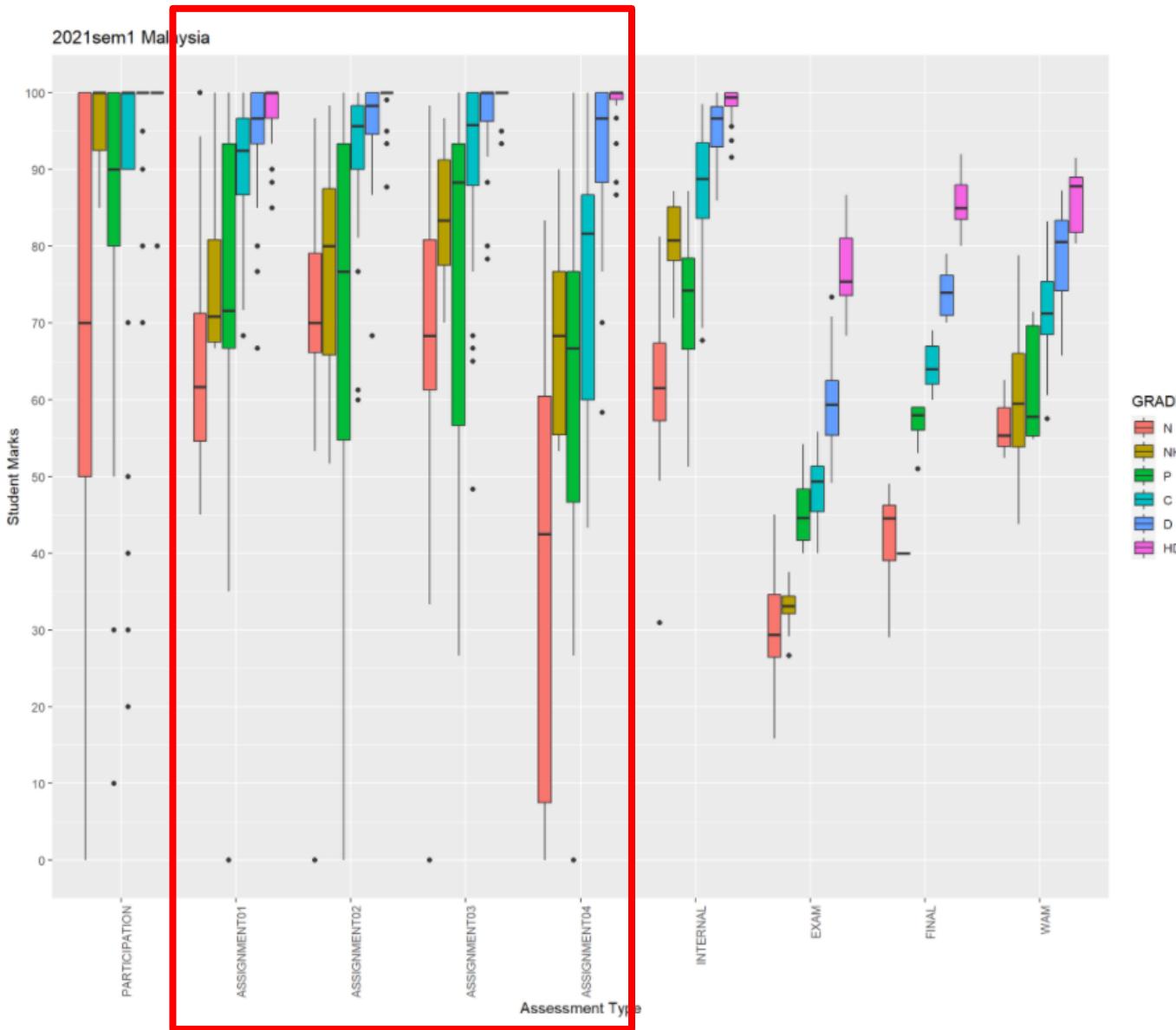
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- Submit by 11.55pm
Melbourne time
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up to 5 days maximum

When you're already dead inside but you gotta keep it together



Assignment

How is it like?



Questions?

Cheating, Collusion, Plagiarism

- **Cheating:** Seeking to obtain an unfair advantage in an examination or in other written or practical work required to be submitted or completed for assessment.
- **Collusion:** Unauthorized collaboration on assessable work with another person or persons.
- **Plagiarism:** To take and use another person's ideas and or manner of expressing them and to pass them off as one's own by failing to give appropriate acknowledgement. This includes material from any source, staff, students or the Internet – published and un-published works.

<http://infotech.monash.edu.au/resources/student/assignments/policies.html>

Ethics

IMPORTANT

- Plagiarism/ Collusion
 - Every semester, we still have cases

Ethics IMPORTANT

■ Plagiarism/ Collusion

- Every semester, we still have cases
 - We will know

```
/home/ubuntu/Projects/work/2015/uct-csc1010h/tutorials/4/raw/r [red] (68%)
```

4-71	[red]	2-66
95-111	[green]	90-106
74-91	[blue]	69-86
115-132	[cyan]	110-127

```
/home/ubuntu/Projects/work/2015/uct-csc1010h/tutorials/4/raw/r [red]
```

```
>>> file: LongJump.py
# [red] a
```

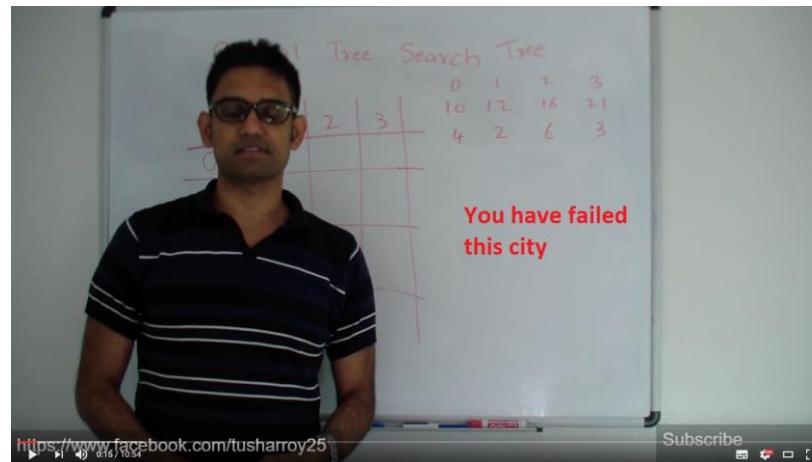
```
print("***** Long Jump Information System *****")
print("Please enter the names of competitors. (Press return when done.)")
print("Competitor no. 1:")
competitor = input()
b,c,g,h,d,k = 1,0,0,0,[],0
maxi,competitors = [],[competitor]
while True:
    b += 1
    print("Competitor no. "+str(b)+":")
    competitor = input()
    if competitor == "":break
    else:
        competitors.append(competitor)
print("Please enter the distances for each competitor.")
for each in competitors:
    print("Competitor "+each+":",sep="")
    at1 = input("Attempt 1:n")
    at2 = input("Attempt 2:n")
    at3 = input("Attempt 3:n")
    x = (at1+at2+at3).lower()
    if (at1+at2+at3).find("oul") != -1:
        x = (at1+at2+at3).lower()
    d.append(at1)
    d.append(at2)
    d.append(at3)
    maxi.append(max(eval(at1),eval(at2),eval(at3)))
```

```
print("***** Long Jump Information System *****")
print("Please enter the names of competitors. (Press return when done.)")
competitor = input()
b,c,g,h,d,k = 1,0,0,0,0,[],0
maximums,competitors = [],[competitor]
while True:
    b += 1
    print("Competitor no. "+str(b)+":")
    competitor = input()
    if competitor == "":break
    else:
        competitors.append(competitor)
print("Please enter the distances for each competitor.")
for each in competitors:
    print("Competitor "+each+" enter:")
attempt1 = input("Attempt 1:\n")
attempt2 = input("Attempt 2:\n")
attempt3 = input("Attempt 3:\n")
g = (attempt1+attempt2+attempt3).lower()
if (attempt1+attempt2+attempt3).find("out") != -1:
    g = attempt1+attempt2+attempt3.lower()
d.append(attempt1)
d.append(attempt2)
d.append(attempt3)
for i in range(0,3):
    maximums.append(max(eval(attempt1),eval(attempt2),eval(attempt3)))
else:
    d.remove("foul")
    d.remove("foul")
    d.remove("foul")
```

Ethics

IMPORTANT

- Plagiarism/ Collusion
 - Every semester, we still have cases
 - We will know
 - Online
 - Your friends
 - Your seniors
 - Not everything you see online is correct



Ethics

IMPORTANT

- Plagiarism/ Collusion
 - Every semester, **we still have cases**
 - People do fail because of it
 - Repeated offenders have it even harder!
 - We will know
 - Online
 - Your friends
 - Your seniors



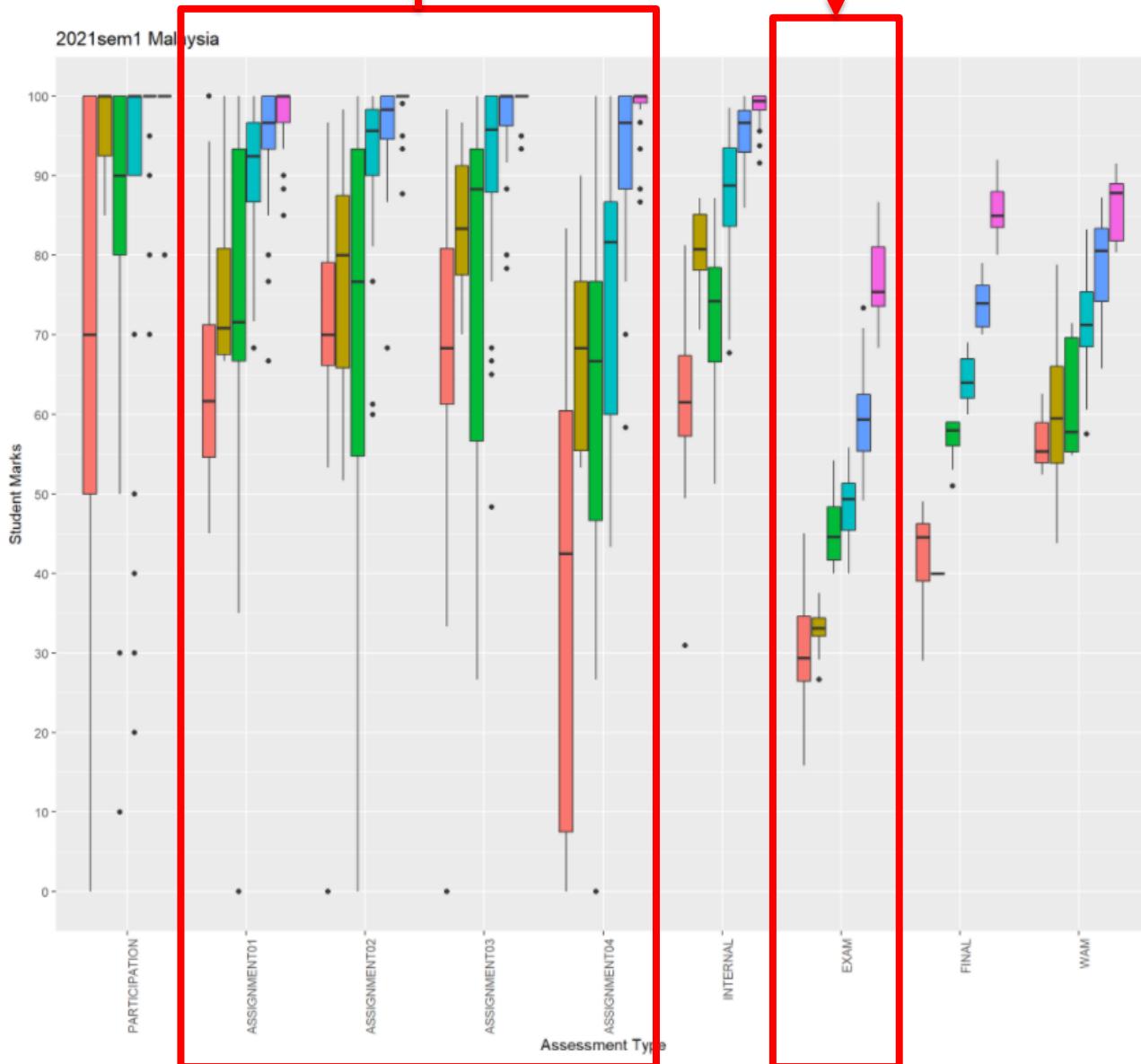
Ethics IMPORTANT



LOHYAT.NET

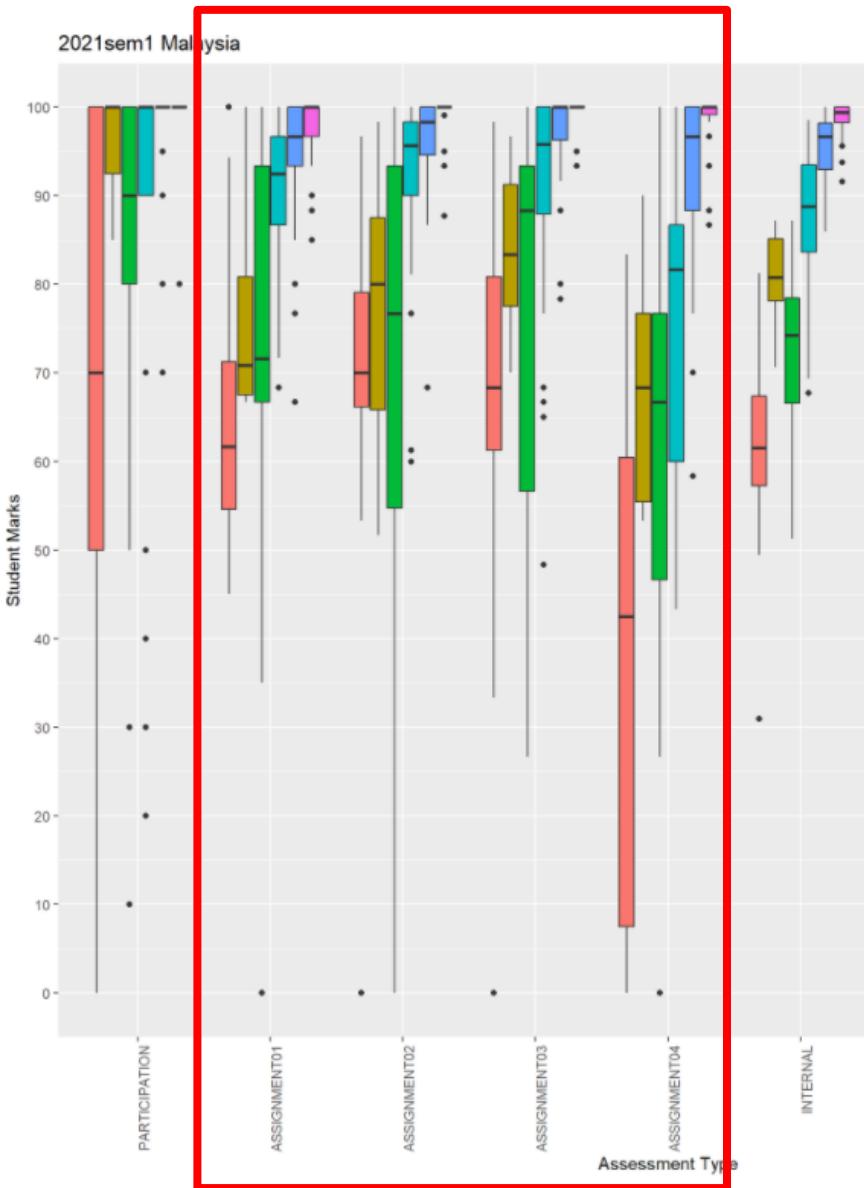
Assignment

How is it like?

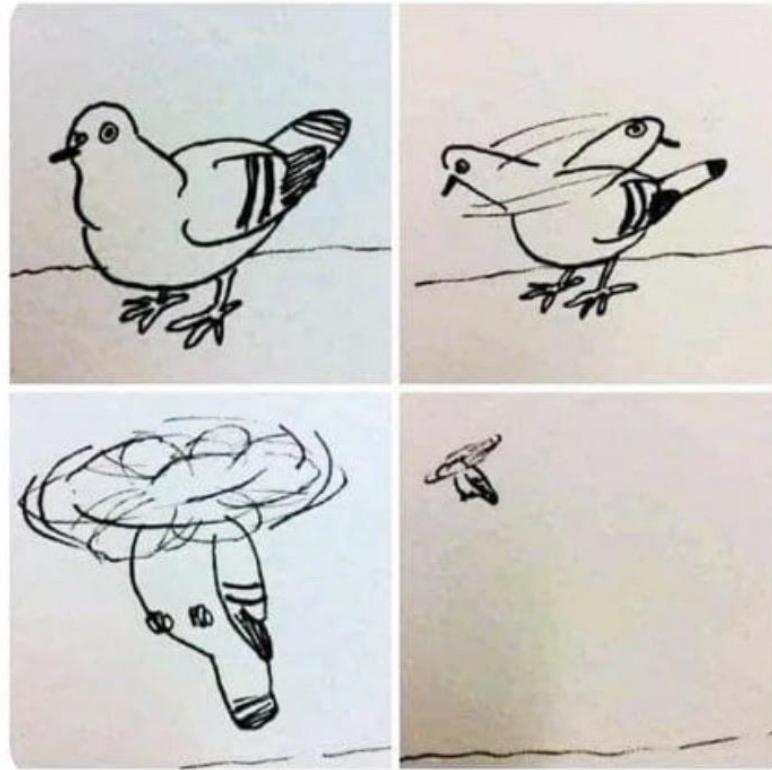


Assignment

How is it like?



When your program
is a complete mess,
but it does its job



Ethics

IMPORTANT

- Academic integrity/ misconduct more serious now
 - A lot of penalty
 - Read <https://www.monash.edu/exams/results/grading-update>

Questions?

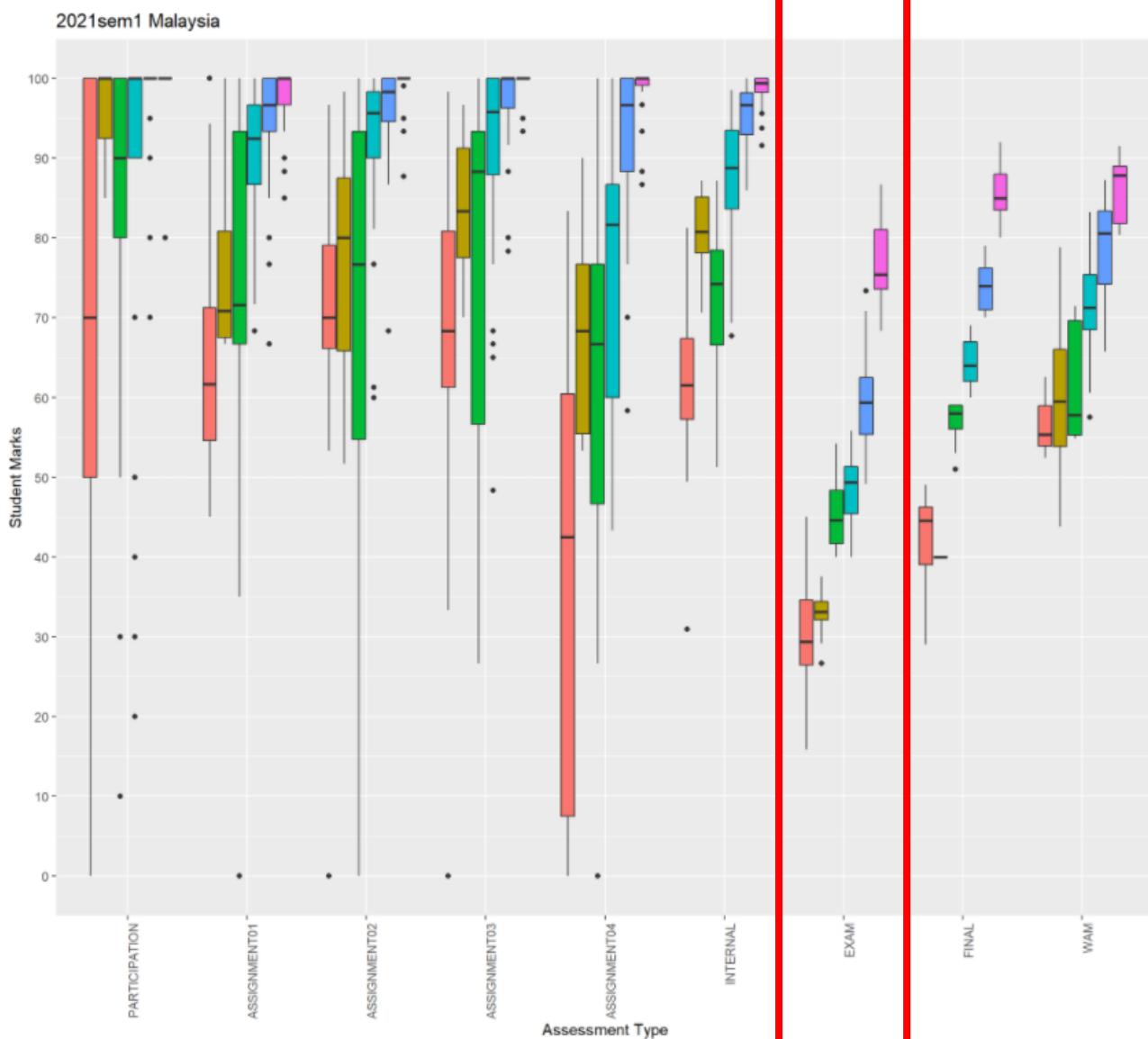
Final Exam

What is it like?

- Final exam
 - 50% total
 - Usually determines if you pass or fail the unit
 - Except certain rare cases

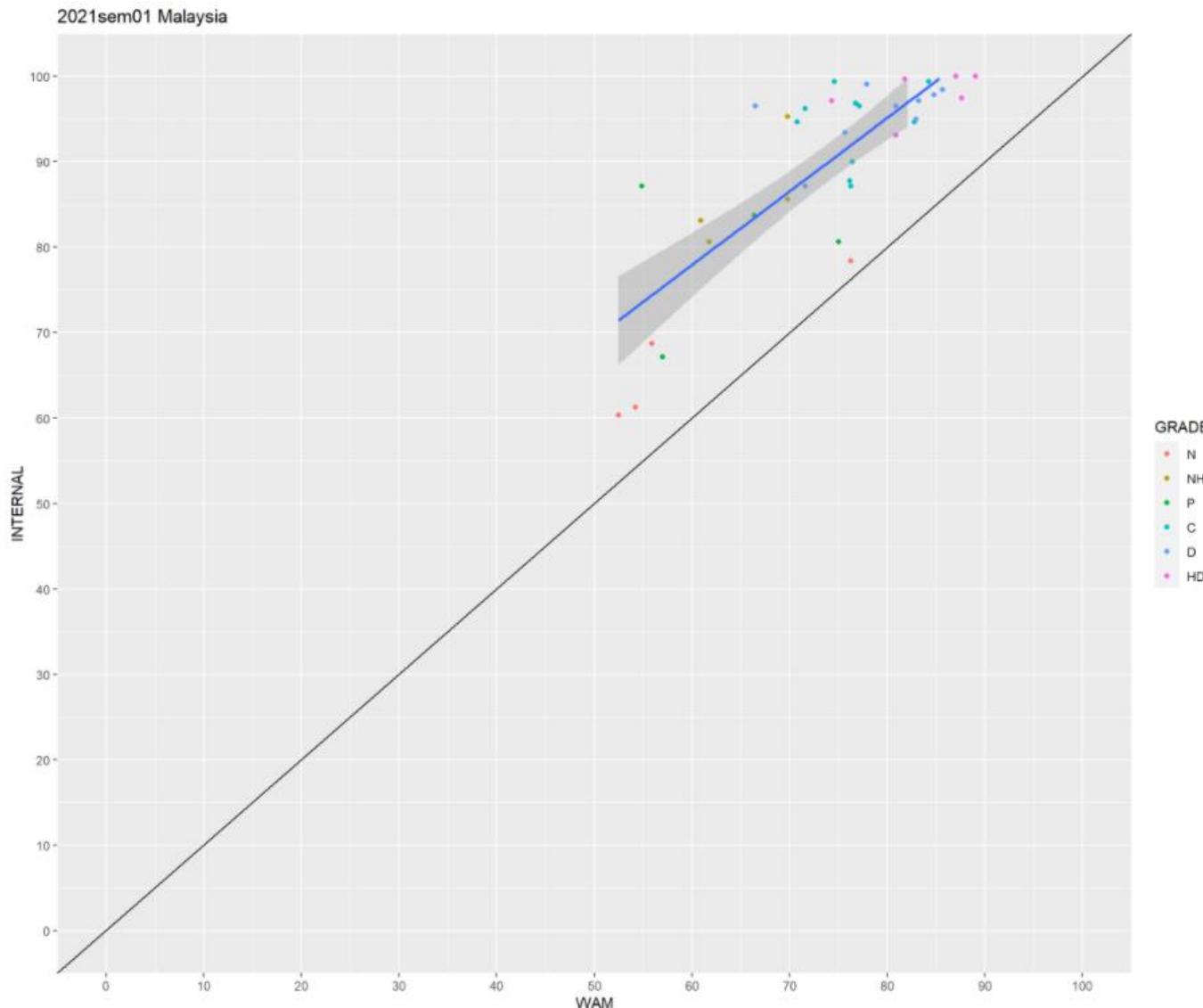
Final Exam

What is it like?



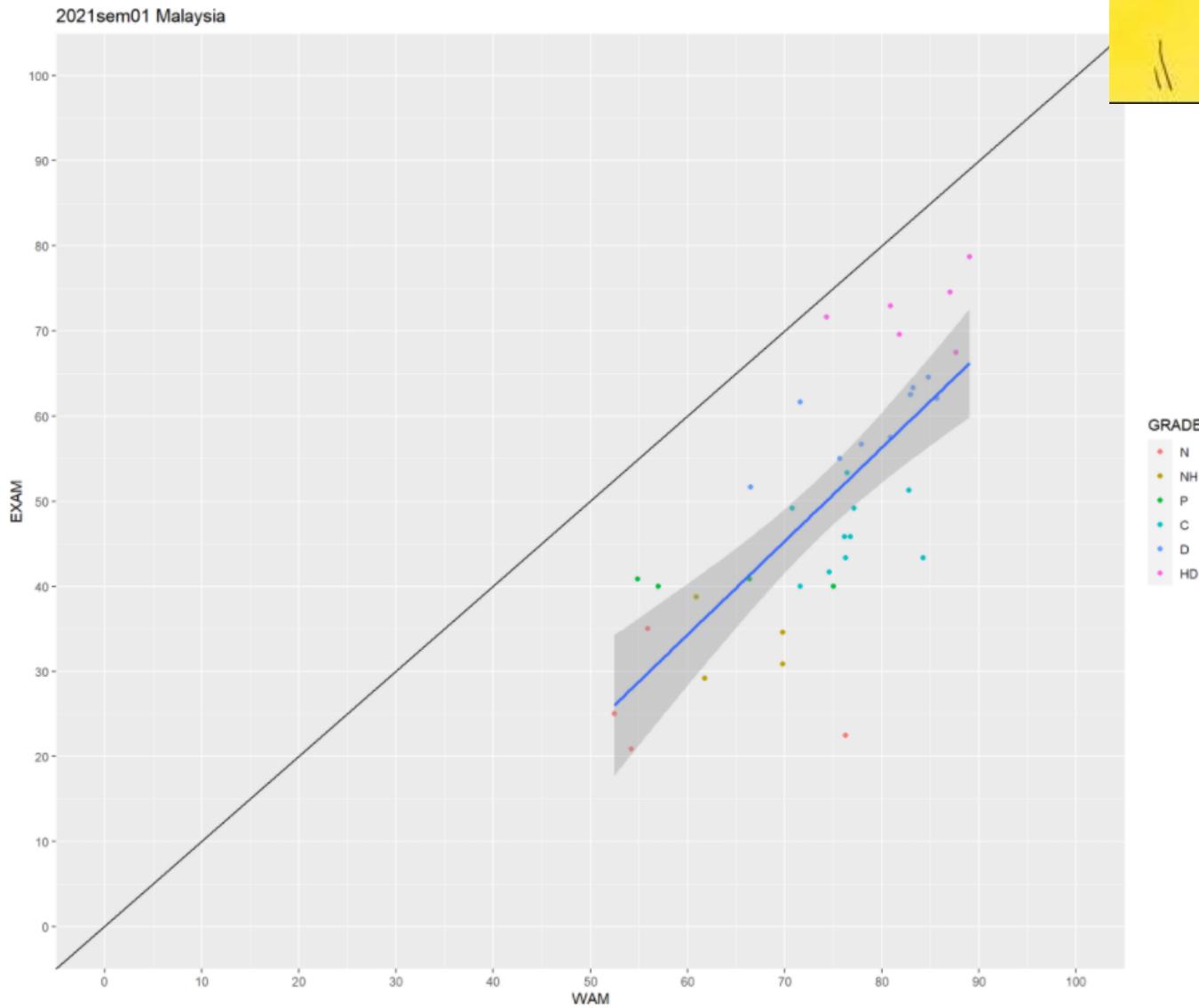
Assignment

How is it like?



Assignment

How is it like?



Final Exam

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 - We will have a revision seminar (5 hours)



Final Exam

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 - 50% total
 - Usually determines if you pass or fail the unit
 - Except certain rare cases
 - Usually, 2 hours exam 10 minutes
 - No programming questions?
 - Pseudocode!
 - Covers all topic
 - We will have a revision seminar (5 hours)
 - Easy to pass, Difficulty to score

Questions?

Introduction

The Assessments -- Hurdles

- To pass the unit
 - Score at least 45% total internal
 - Score at least 45% for final exam
 - Score at least 50% total

Introduction

The Assessments -- Hurdles

- To pass the unit
 - Score at least 45% total internal
 - Score at least 45% for final exam
 - Score at least 50% total
 - Else 45NH or 45NS

Introduction

The Assessments -- Hurdles

- To pass the unit
 - Score at least 45% total internal
 - Score at least 45% for final exam
 - Don't skip, it affects your WAM
 - Score at least 50% total
- Else 45NH or 45NS

Beginning of the sem:



Week 9 rn:



Questions?

Introduction

Additional help...

- There are additional help for you in the unit

Introduction

Additional help...

- There are additional help for you in the unit
 - PASS session

Introduction

Additional help...

- There are additional help for you in the unit
 - PASS session
 - Virtually due to COVID-19
 - By **Mikey** (there will be a Microsoft Teams channel for him)

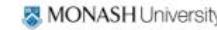
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 - Additional notes by Daniel Anderson

Unit Notes

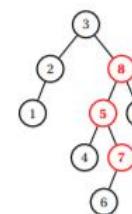
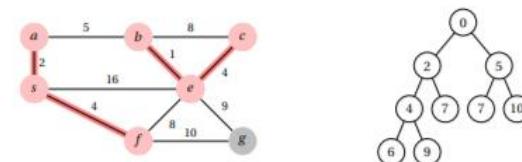
- Unit notes are written based on the material covered in lecture notes
 - Notes for all 12 weeks are available in a single PDF file on Moodle
 - Click on “Unit Information”
 - Scroll down to the bottom of the page
 - Click on “Lecture Notes – written by Daniel Anderson”



FIT2004

Algorithms and Data Structures

Course notes by Daniel ANDERSON



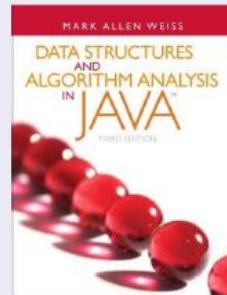
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34324 34322 34344 31311 41243 33444 23332 42143 22241 23143 23411 33312	31311 22241 23411 23312 41242 23312 23312 41243 23312 23312 33444 33444	31311 23411 23312 41242 41242 23312 23312 41243 22241 23143 34344 33444	43122 42143 23143 22241 41242 31311 23312 41243 23312 23312 34344 33444
\rightarrow	\rightarrow	\rightarrow	\rightarrow

Introduction

Additional help...

- There are additional help for you in the unit
 - PASS session
 - Additional notes by Daniel Anderson
 - Textbook

Mark Allen Weiss, **Data Structures and Algorithm Analysis in Java**
3rd Edition. Addison-Wesley.



This book (and this holds true no matter what the recommend book on this topic is) covers some material not in the lectures and vice versa. Relevant to the course plan this semester are **Chapters 1, 2, 3, 4** (not splay trees), **Chapter 5** (linear, chaining, quadratic), **Chapter 6** (heap and heap sort), **Chapter 7** (relevant sorts), **Chapter 9** (topological sort, paths, spanning Trees, and **Chapter 8** (where relevant), and **Chapter 10**.

Introduction

Additional help...

- There are additional help for you in the unit
 - PASS session
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 - Textbook
 - Forum via Ed

Introduction

Additional help...

- And for Malaysia, we have **Microsoft Teams**
 - We used to use Slack (still superior to MS Teams)
 - Think of it as Discord for professionals (used a lot in the real world)

Introduction

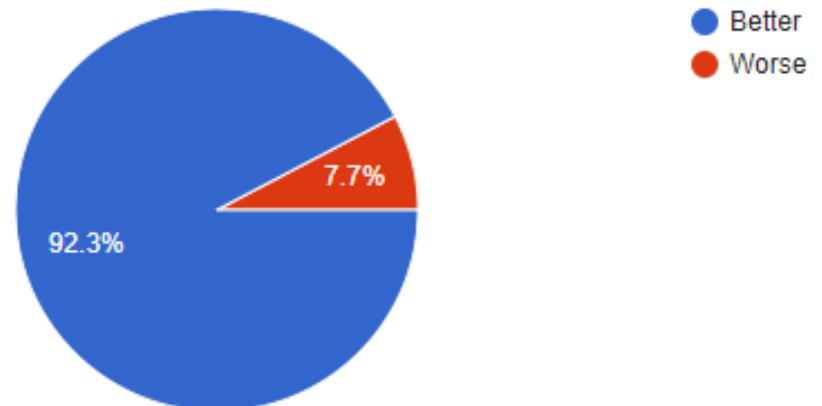
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 - Casual communication
 - Easy file sharing
 - Notification control

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Ctrl+1



Ctrl+2



Ctrl+3



Ctrl+4



FIT2004_2019s... 🔔

Ian LIM

[Jump to...](#)[All Threads](#)

Channels



assignment01

assignment02

assignment03

assignment04

exam

general

🔒 group_friday0800

🔒 group_monday0800

🔒 group_thursday0800

🔒 group_tuesday1500

meme

midsemtest

week01

week02

week03

week04

week05

week06

week07

#assignment01

| 2 | 0 | Add a topic



Search



assignment01

You created this channel on March 1st. This is the very beginning of the # assignment01 channel.

[🔗 Set a purpose](#) [➕ Add an app](#) [👤 Invite others to this channel](#)

Friday, March 1st



Ian LIM 12:38 PM

joined #assignment01 along with Lee Sheng Long.



Message #assignment01





Ctrl+1

FIT2004_2019s...

Ian LIM

#assignment04

☆ | 122 | 0 | Add a topic

Yesterday

Jump to...



Ctrl+2



Ctrl+3



Threads



Channels

assignment01

assignment02

assignment03

assignment04

exam

general

group_friday0800

group_monday0800

group_thursday0800

group_tuesday1500

meme

midsemtst

week01

week02

week03

week04

week05

week06

week07

week08

week09

week10

week11

week12

Direct Messages



Slackbot

Ian LIM (you)

Chong

Chong Hong

J

Jareth

Jeffrey

Kin Weng

Lim Khai Fung

mohammed Himmat

Muhammad Saad Usman

Yep

Just noticed.

Any more invalid answers, please let me know here.

I'll update it in my unit tests and release them here.

Kin Weng 11:46 PM

Thanks Nicholas! You've been helpful

Nicholas Cheng 11:48 PM

Can someone verify detour path

test_03

Sorry test_04

1 isn't a service node, no path right?

Unless I'm reading things wrongly.

A detour path is a path from the source vertex to the target vertex; passing through at least one of the service vertices.

(edited)

ResidentSleeper 11:50 PM

ya it should be

Nicholas Cheng 11:50 PM

Okay, I'm counting it as no path.

@channel

Zip ▾



unittest_v5.zip

5 kB Zip

That's it from me. Final release. Only bug fixes from now on.

Have fun.

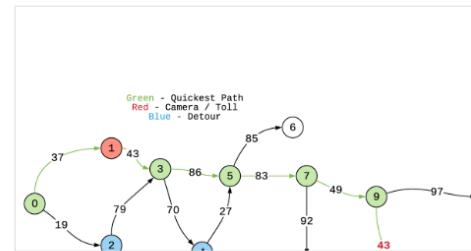
11:54 PM Forgot about the 3 graphs.

PDF ▾



graph_001.pdf

17 kB PDF



PDF ▾



graph_002.pdf

23 kB PDF

F Ctrl+1

F Ctrl+2

F Ctrl+3

+

FIT2004_2019s... ▾ 

- Ian LIM
- Jump to...
- Threads

Channels 

- # assignment01
- # assignment02
- # assignment03
- # assignment04**
- # exam
- # general
- 🔒 group_friday0800
- 🔒 group_monday0800
- 🔒 group_thursday0800
- 🔒 group_tuesday1500
- # meme
- # midsemtest
- # week01
- # week02
- # week03
- # week04
- # week05
- # week06
- # week07
- # week08
- # week09
- # week10
- # week11
- # week12

Direct Messages 

#assignment04

☆ | 8 122 | 0 | Add a topic

Tuesday, May 21st

 Ian LIM 8:20 AM
@channel a path by definition in graph theory doesn't include repeated vertices. Thus. For Task 3, your are safe to assume that such cases should not occur (in the input file file). (edited)

 r 2:35 PM
@channel can people who have completed task 1 post their output for this so that we can have something to test against that is confirmed by a few people
aGraph.buildGraph("basicGraph.txt")
for i in range(0,10):
 for j in range(0,10):
 print(aGraph.quickestPath(i,j))

 Ian LIM 11:23 PM
@channel @r Do share your outputs here, as at the moment there isn't any examples posted on the forums yet and I do not know when they would be posting the examples (I can't post mine)

 Jareth 11:27 PM
My potential answers for it, pls take it with a grain of salt as I am unsure and have just finished it (edited)

Task 1 ans (maybe).txt ▾

```

1 FROM: 0 TO: 3 ANS: ([0, 3], 5.7)
2 FROM: 1 TO: 0 ANS: ([1, 0], 3.3)
3 FROM: 1 TO: 2 ANS: ([1, 4, 7, 2], 17.6)
4 FROM: 1 TO: 3 ANS: ([1, 0, 3], 9.0)
5 FROM: 1 TO: 4 ANS: ([1, 4], 3.1)
6

```

Oh right, I excluded those that I found with no links as well

Let me know if anything needs to be checked

 Ian LIM 11:44 PM
Thanks @Jareth. Can the others share to double check as well? #MoreSeed #LessLeech

 Kin Weng 11:44 PM
Yup, the output are correct

Here's my output for task 2. I checked it with Radek but further confirmation would be appreciated

t2output.txt ▾

```

1 ([0], 0.0)
2 ([], -1)
3 ([], -1)
4 ([0, 3], 5.7)
5 ([], -1)
6

```

Introduction

Additional help...

- And for Malaysia, we have **Microsoft Teams**
 - We used to use Slack (still superior to MS Teams)
 - Think of it as Discord for professionals (used a lot in the real world)
- Why?
 - Less email spam
 - Casual communication
 - Easy file sharing
 - Notification control
 - I can host calls directly from MS Teams if I wish so

Introduction

Additional help...

- And for Malaysia, we have **Microsoft Teams**
 - We used to use Slack (still superior to MS Teams)
 - Think of it as Discord for professionals (used a lot in the real world)
 - Discord is not used in the industry
 - Discord lack some functionality I need
- Why?
 - Less email spam
 - Casual communication
 - Easy file sharing
 - Notification control
 - I can host calls directly from MS Teams if I wish so

Search

Monash University LH

Teams General Posts Files Class Notebook +

Your teams

[Tourism_2020] BigData Approach to ...

FIT2004_2021sem02

General

Assignment01

Assignment02

Assignment03

Assignment04

Exam

Week01

Week02

Week03

Week04

Week05

Week06

Week07

Week08

Week09

Week10

Week11

Week12

FIT3155_2021sem02

General

Assignment01

Assignment02

Assignment03

Assignment04

Exam

Week01

Week02

Week03

Week04

Week05

Week06

Week07

Week08

Week09

Week10

Week11

Week12

Reply

Lim Wern Han 20/07 5:35 pm Edited

FIT2004 class arrangements for year2021 semester02

Here are the class arrangement for the semester that we would be adhering to.

Lecture/ Workshop

- Allocated on Monday 11:00 to 14:00 (3 hours).
 - This timeslot would not be used unless any emergency such as replacement classes require it.
- All lecture content have been prerecorded and will be uploaded onto YouTube with timestamp.
 - Links are posted in their associated channels (Week01 lecture videos in Week01 channel).

Tutorial

- Allocated on Wednesday 12:00 to 15:00 (3 hours).
 - This timeslot will be used for the **Sanity Check** session (see below).
- All tutorial content have been prerecorded and will be uploaded onto YouTube with timestamp.
 - Links are posted in their associated channels (Week02 tutorial videos in Week02 channel).

Sanity Check

- This is something unique to FIT2004 and FIT3155 (my classes) in Malaysia.
- Basically all of the lecture and tutorial materials have been uploaded as recording, thus there is no need for a face-to-face class.
- The Sanity Check class is a special one **conducted during the tutorial timeslot** for:
 - Question-Answering (QnA) session for the week's content.
 - Assignment briefing and debriefing.
 - Discussion about anything important/ extra from the week itself.
 - Additional questions/ exercises to work together on the spot (might include past year).
 - Summary and mind-map for the content of the week itself.
- IMPORTANT:** This is something **EXTRA** that I am doing:
 - So it will not be recorded.
 - This is a very casual session, thus everyone can chill especially since it is not recorded.
 - It isn't compulsory to attend, but skipping it is a big loss. I will show you why in the 1st Sanity Check. So be present.
 - I have checked everyone's Allocation, it shouldn't be any clashes.
 - Usually would end in 2 hours (thus 12:00 to 14:00 on Wednesday).
- Google calendar invite** has been sent:
 - To your student email
 - Accept it there
 - Sign in with your Monash Student account in order to access the Zoom else you will be blocked.
 - <https://monash.zoom.us/j/88993598499?pwd=YnV5YVXRzImN0ZRYzN5SGZXMyZvQT0>

Questions?

Introduction

Lecture Changes

- Think of it more of a workshop rather than a lecture

Introduction

Lecture Changes

- Think of it more of a workshop rather than a lecture
 - Learn the basic/ core concept

Introduction

Lecture Changes

- Think of it more of a workshop rather than a lecture
 - Learn the basic/ core concept
 - Expand on the basic/ core concept

Introduction

Lecture Changes

- Think of it more of a workshop rather than a lecture
 - Learn the basic/ core concept
 - Expand on the basic/ core concept
 - Application of what you have learnt!

Introduction

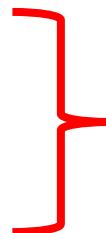
Lecture Changes

- Think of it more of a workshop rather than a lecture
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 - Expand on the basic/ core concept
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 - Similar to how professional certification workshops are conducted...

Introduction

Lecture Changes

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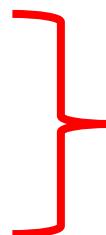


Interaction

Introduction

Lecture Changes

- Think of it more of a workshop rather than a lecture
 - Learn the basic/ core concept
 - Expand on the basic/ core concept
 - Application of what you have learnt!
 - Similar to how professional certification workshops are conducted...
 - We will discuss problems...



Interaction

Introduction

Lecture Changes

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Interaction

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 - Similar to how professional certification workshops are conducted...
 - We will discuss problems...
 - We will create more problems... and **solve them**



Interaction

Introduction

Lecture Changes

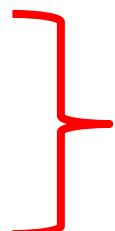
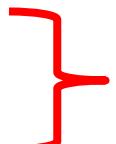
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 - Together
 - On whiteboard
 - Live programming sessions



Interaction

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 - Together
 - On whiteboard
 - Live programming sessions
- 
- 

Interaction

Focus on the process

Introduction

Lecture Changes

- Slides will seem long, but as they go point-by-point as animation – **a narrative that is easy to follow**
 - And a PDF without animation

Introduction

Lecture Changes

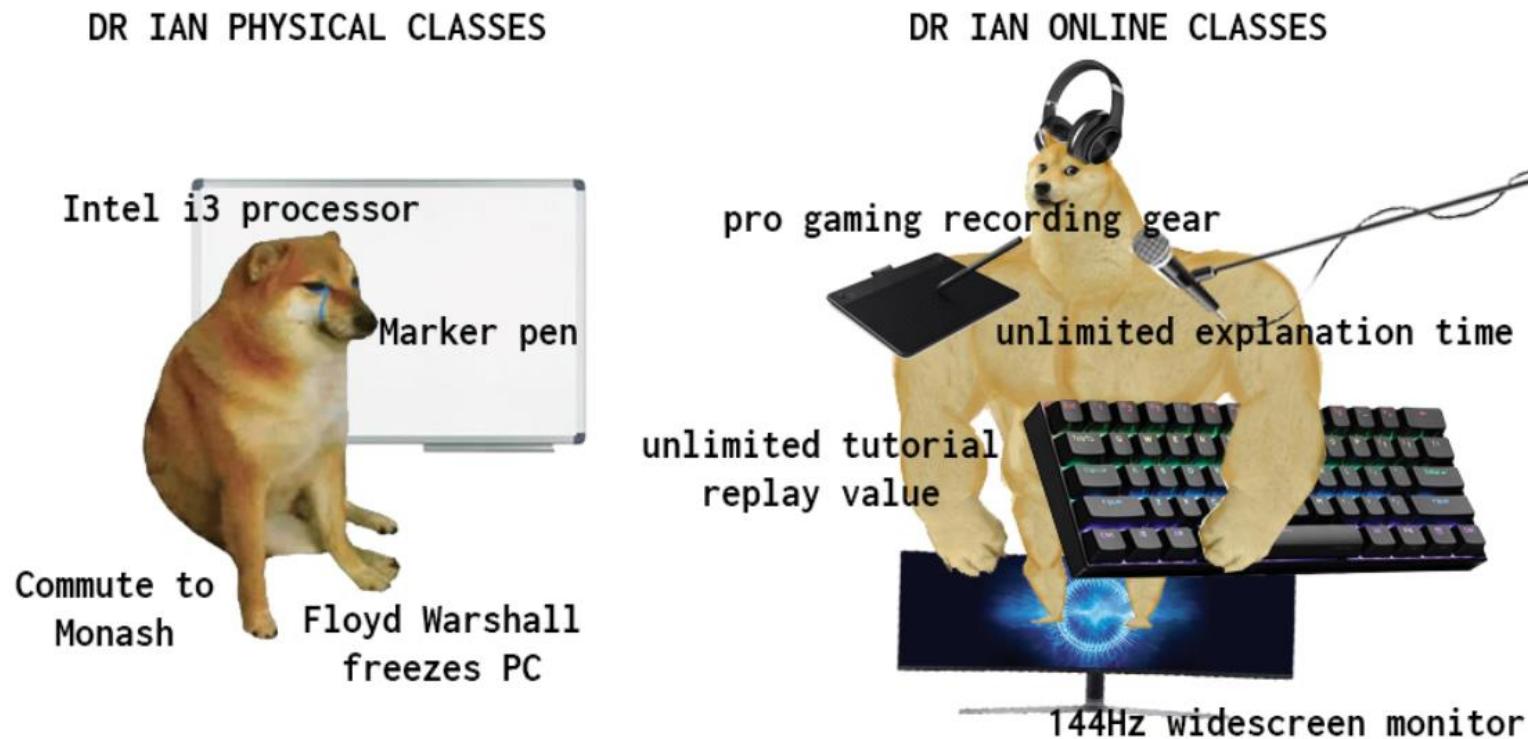
- ... but then COVID-19 happen =(
 - Soooooooo Zoom University it is!



Introduction

Lecture Changes

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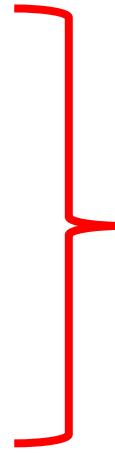
Introduction

Lecture Changes

- Everything is recorded and uploaded on Youtube
 - Mainly reusing what I have done last semesters
 - New video if needed
 - Can replace old video
 - Can supplement old video
 - Videos are in parts
 - Adding timestamp for easy viewing
 - PS: Will release the video early in the week,
subjected to amount of edits required

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 - Adding timestamp for easy viewing
 - PS: Will release the video early in the week,
subjected to amount of edits required
- 
- Same as
tutorial/ studio

Introduction

Lecture Changes

- Then we have a face-to-face session
- View it as a **Sanity-Check**
 - Check if everyone is still sane
 - Address any concerns
 - Answer any questions
 - More personal explanation of issues
 - etc...

Introduction

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- View it as a **Sanity-Check**
 - Check if everyone is still sane
 - Address any concerns
 - Answer any questions
 - More personal explanation of issues
 - etc...
 - Class sent out as calendar invite:
 - To make managing it easier
 - Not all Allocate+ timeslot is used, but might be used for extra classes
 - Assignment briefing/ debrief
 - Revision class
 - Etc..

Introduction

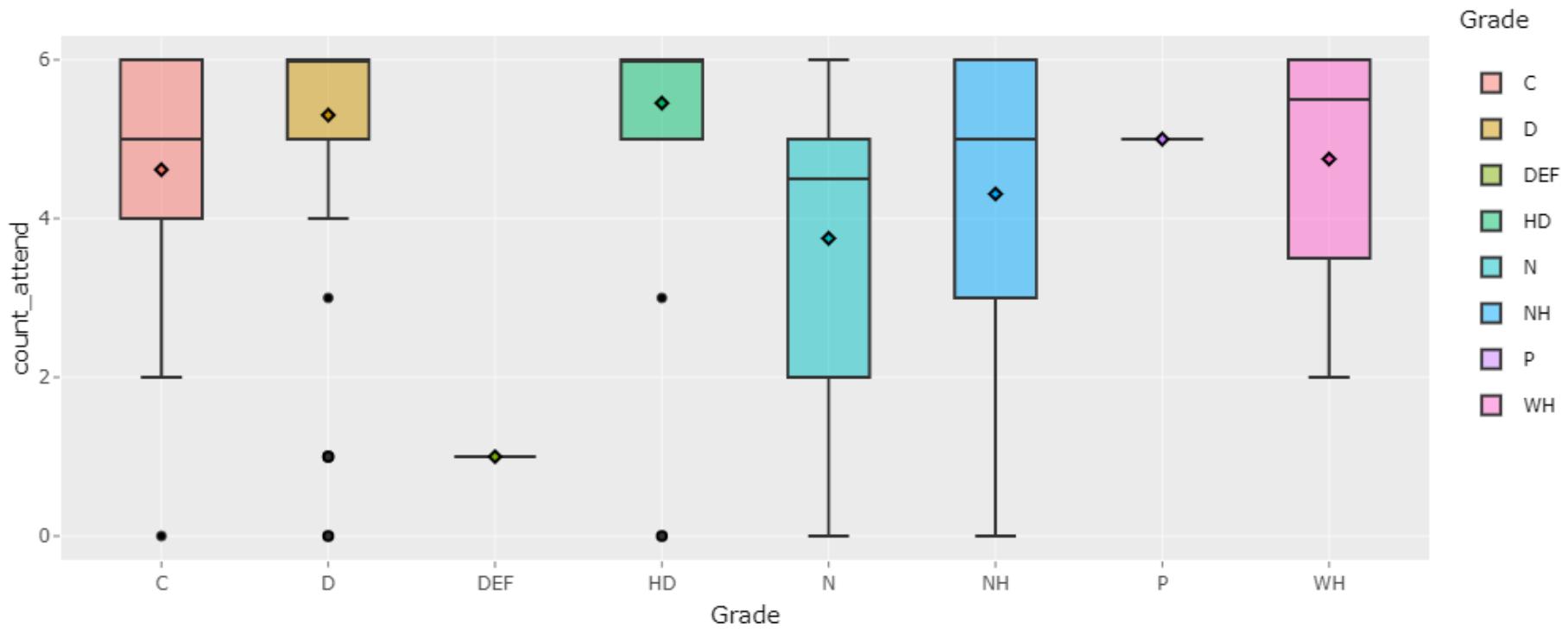
Lecture Changes

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- It is **important**

Introduction

Lecture Changes

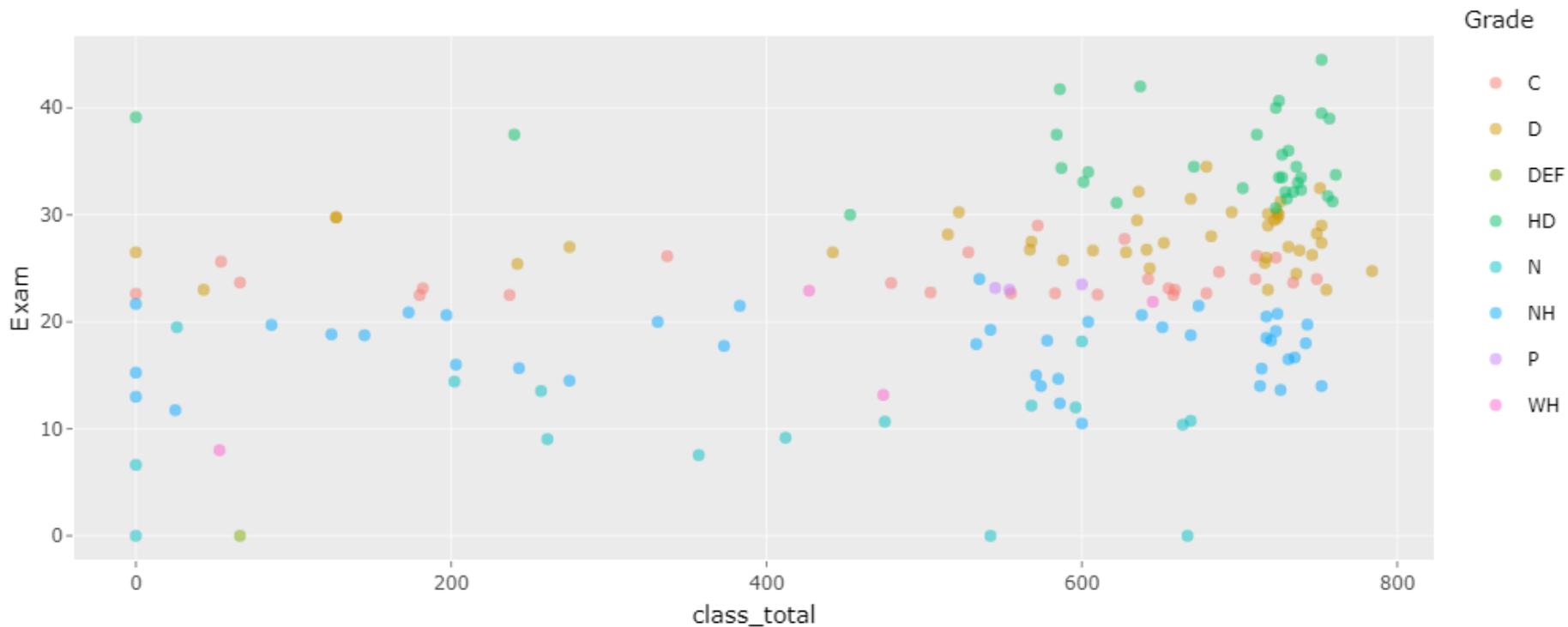
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Introduction

Lecture Changes

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- View it as a **Sanity-Check**
- It is **important**



Introduction

Lecture Changes

- Then we have a face-to-face session
- View it as a **Sanity-Check**
- It is **important**

- It won't be recorded
 - Show up if you want to know
 - It is meant to be casual -- recording make people uncomfortable
 - It is an extra effort I am putting in
 - Everything needed is already recorded for lecture/ workshop/ tutorial/ studio

Questions?

Introduction

Senior's advice...

- Here's what they think about the unit

Prepare for tutorial before going to it

Attend tutorials, sit tight, listen, take notes

Don't be afraid to attempt the tutorials questions and coding challenges even if you don't get it right. It's all about learning

Listen to Ian. Easy HD

Please read the textbook to understand better the unit and do the pre class activity to get the free marks !!!

Always keep up to date with topics being done. Also always carefully listen to what Ian says; It will help you for both exams and assignments.

Goodluck

Questions?

Thank You