# Algorithmic Problem Solving

## Init
## 2020

Prakash Hegade

KLE TECH KLE Technological University
Creating Value
Leveraging Knowledge

Algorithmic Problem Solving

# Hello There!

**What do you think are we doing?**

## Algorithmic - Problem Solving

**or**

## Algorithmic Problem - Solving

# What's Up with APS?

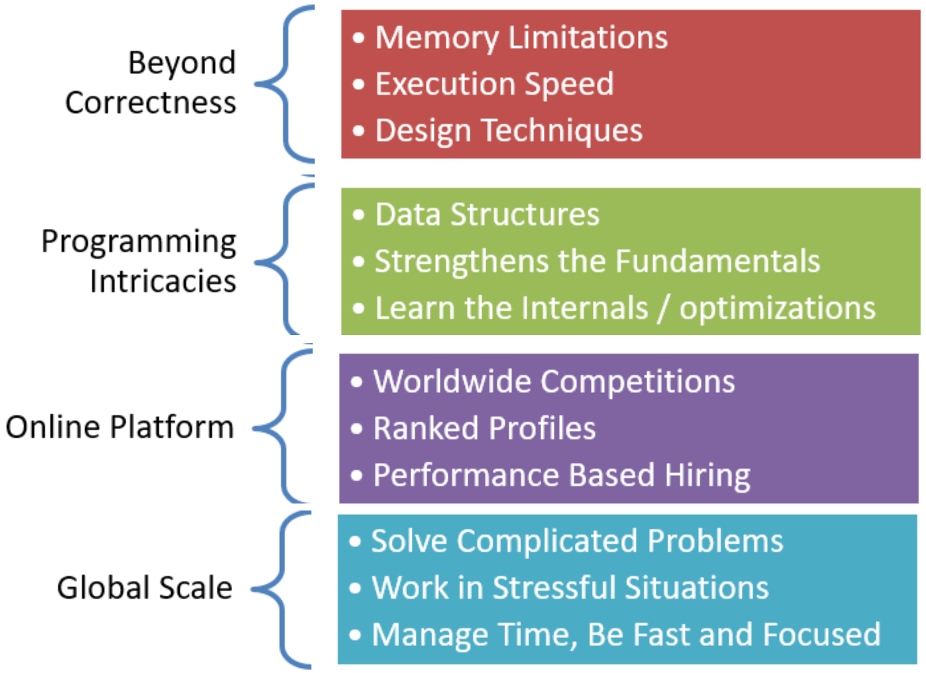
| | |
|---|---|
| • ~~I will  work my best~~ | Only a 100/100 is success |
| • ~~Functionality works~~ | What about speed? |
| • ~~int, float, double~~ | Hello! Heard of long long? |
| • ~~I have the approach~~ | lol, Technique? |
| • ~~Good at Basics~~ | No inventing basics |
| • ~~I work with Problems~~ | Comprehension! |

# Towards Competitive Programming

## Traditional Programming Classes

- Concentrates on Correctness
- Programming Notions and Syntax
- Coding on IDE
- Class level Evaluation

## Competitive Programming



Beyond Correctness
- Memory Limitations
- Execution Speed
- Design Techniques

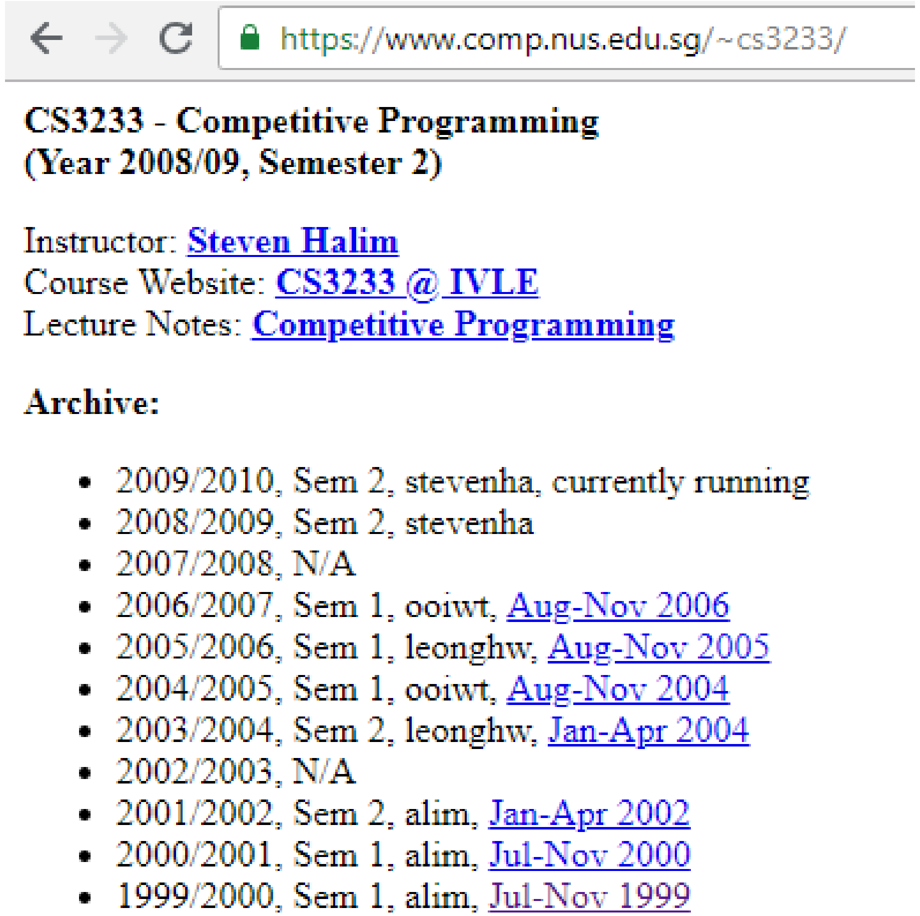
Programming Intricacies
- Data Structures
- Strengthens the Fundamentals
- Learn the Internals / optimizations

Online Platform
- Worldwide Competitions
- Ranked Profiles
- Performance Based Hiring

Global Scale
- Solve Complicated Problems
- Work in Stressful Situations
- Manage Time, Be Fast and Focused

# Course Design

- Syllabus framed, revised and revisited with feedback from **Samsung Team**
- Introduced at **VI** semester
- 6 Credit Elective, Open to all Branches
  - Screening test for intake



**CS3233 - Competitive Programming**
**(Year 2008/09, Semester 2)**

Instructor: Steven Halim
Course Website: CS3233 @ IVLE
Lecture Notes: Competitive Programming

**Archive:**

- 2009/2010, Sem 2, stevenha, currently running
- 2008/2009, Sem 2, stevenha
- 2007/2008, N/A
- 2006/2007, Sem 1, ooiwt, Aug-Nov 2006
- 2005/2006, Sem 1, leonghw, Aug-Nov 2005
- 2004/2005, Sem 1, ooiwt, Aug-Nov 2004
- 2003/2004, Sem 2, leonghw, Jan-Apr 2004
- 2002/2003, N/A
- 2001/2002, Sem 2, alim, Jan-Apr 2002
- 2000/2001, Sem 1, alim, Jul-Nov 2000
- 1999/2000, Sem 1, alim, Jul-Nov 1999

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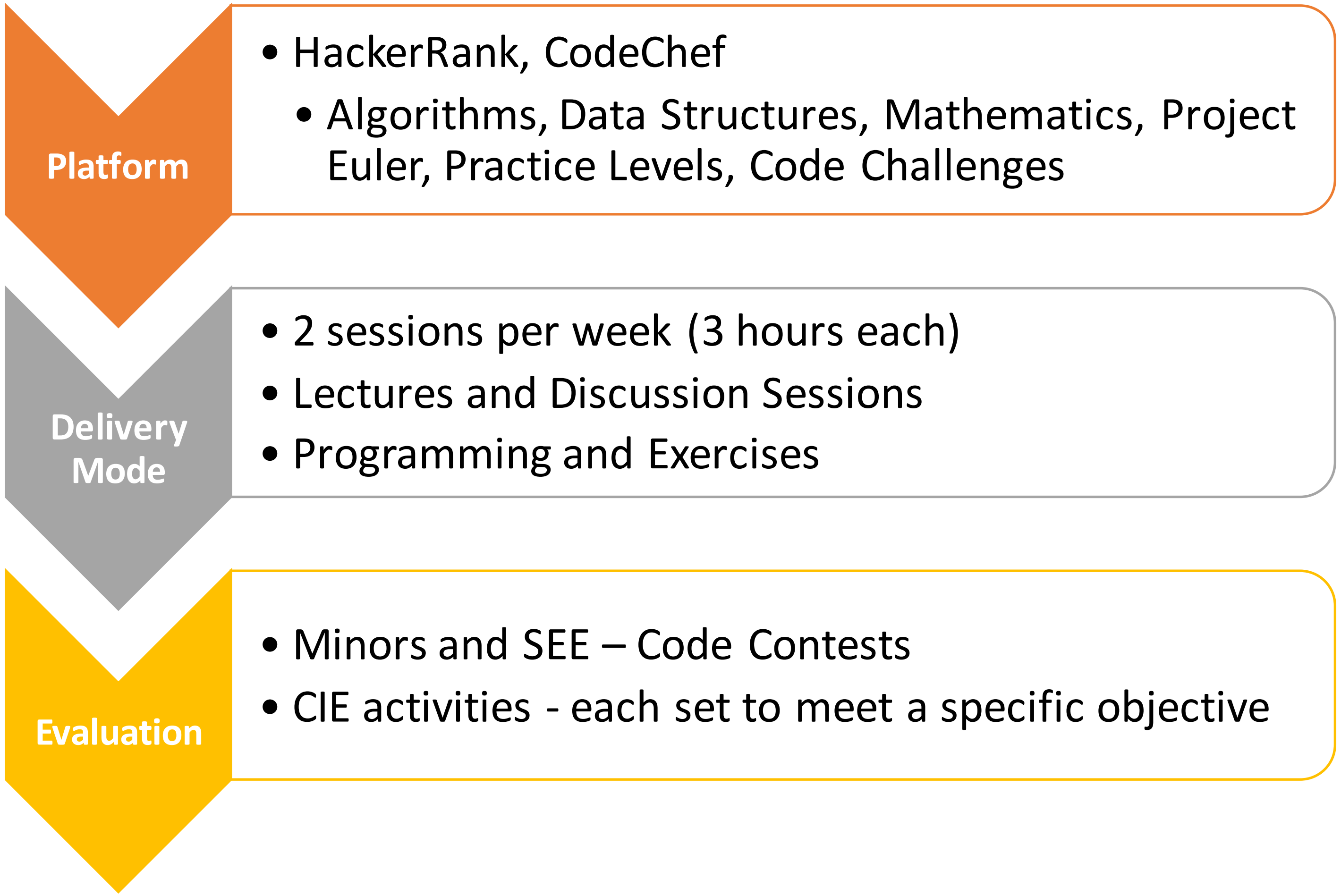
# Course Delivery



**Platform**

- HackerRank, CodeChef
  - Algorithms, Data Structures, Mathematics, Project Euler, Practice Levels, Code Challenges

**Delivery Mode**

- 2 sessions per week (3 hours each)
- Lectures and Discussion Sessions
- Programming and Exercises

**Evaluation**

- Minors and SEE – Code Contests
- CIE activities - each set to meet a specific objective

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# Why APS?

- Makes you a better programmer and most importantly a better thinker

- Intangible skill that will set you apart from the common herd

- You love to code

- Its fun!

**If you have any other reason,**

**Shut Up!**

# Then There is a Problem

- **A Beginner**
  - Not seen a problem of this kind
  - Takes time to comprehend the problem
  - Code, even if the solution is not known
  - Try with a brute force

# Then There is a Problem

- **An Inexperienced**
  - Recognizes the problem
  - Realizes that usual thinking does not work
  - Thinks there is an algorithm to the solution
  - Gives up and moves on

# Then There is a Problem

- **A Non-Competitive Programmer**
  - Knows the approach to solve the problem
  - Understands the nature of input and data flow
  - Makes mistakes in implementation
  - Takes hours to obtain the solution

# Then There is a Problem

- **A Competitive Programmer**
  - Solves the problem in about 30 minutes without any mistakes

# The Approach

- Methods to solve
- Methods to solve efficiently
- Methods to solve quickly

# The Approach

**Problem:**

Left rotate the given array where number of array elements is **n** and Number of rotations is **d**

Rotate the array **d** times

**Method to Solve**

Check if **d > n** and do **d % n**

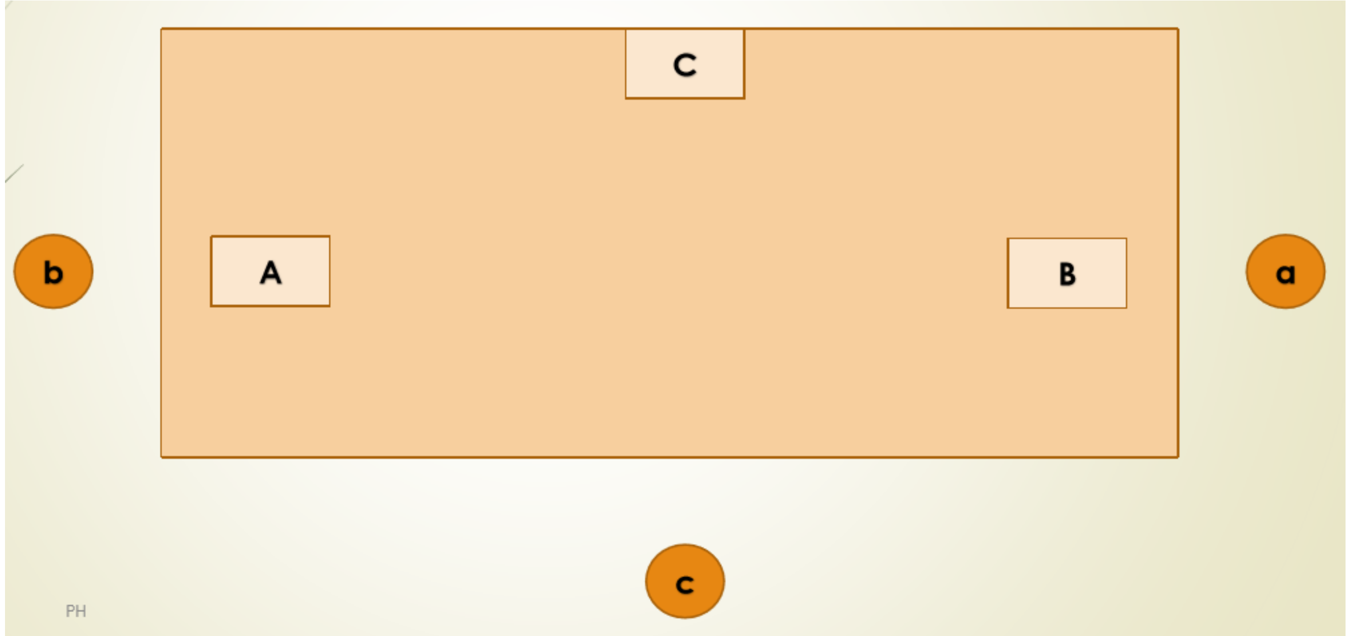
**Method to Solve Efficiently**

Check if **d > n** and do **d % n** and then copy into a new array: **d** to **n**, then **0** to **d-1**

**Method to Solve Quickly**

# Keeping the Senses Right

- Two's company and three's a crowd, then what's four and five?
- On what logic is the following ordering done?
  - gun, shoe, spree, door, hive, kicks, heaven, gate, line, de
- Wire the electricals



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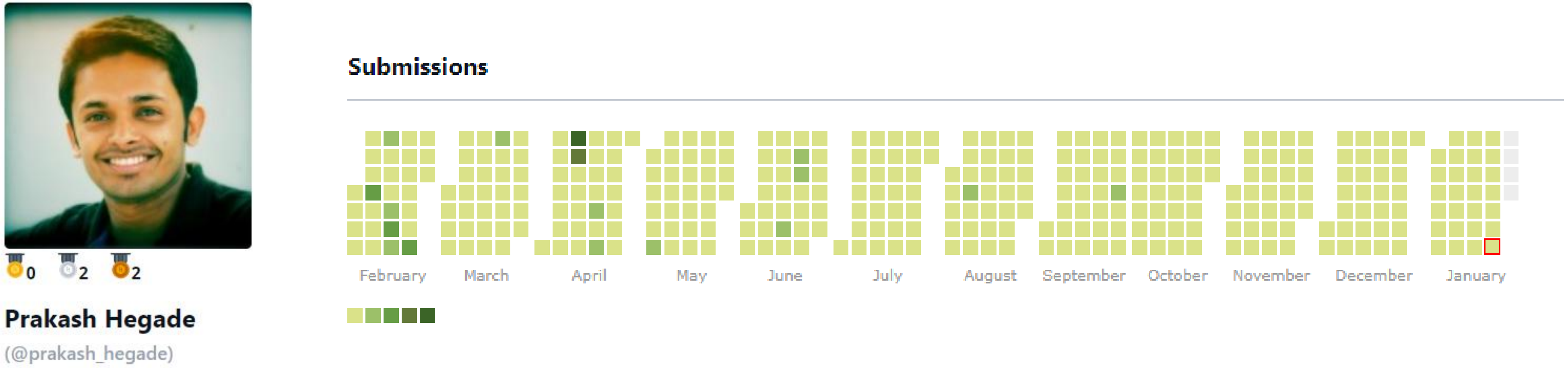
# Course CIE and SEE

| Evaluation Type | Marks |
|---|---|
| Minor 1 | 15 |
| Minor 2 | 15 |
| Activities | 40 |
| SEE | 30 |
| **Total** | **100** |

# Activity 1

## 21 days makes a Habit

Code on HackerRank for Straight 21 Days and Earn 5 Marks in the process, bring your 'Problem Solving' Ranking to less than 35,000



Prakash Hegade

(@prakash_hegade)

Submissions

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# Activity 2

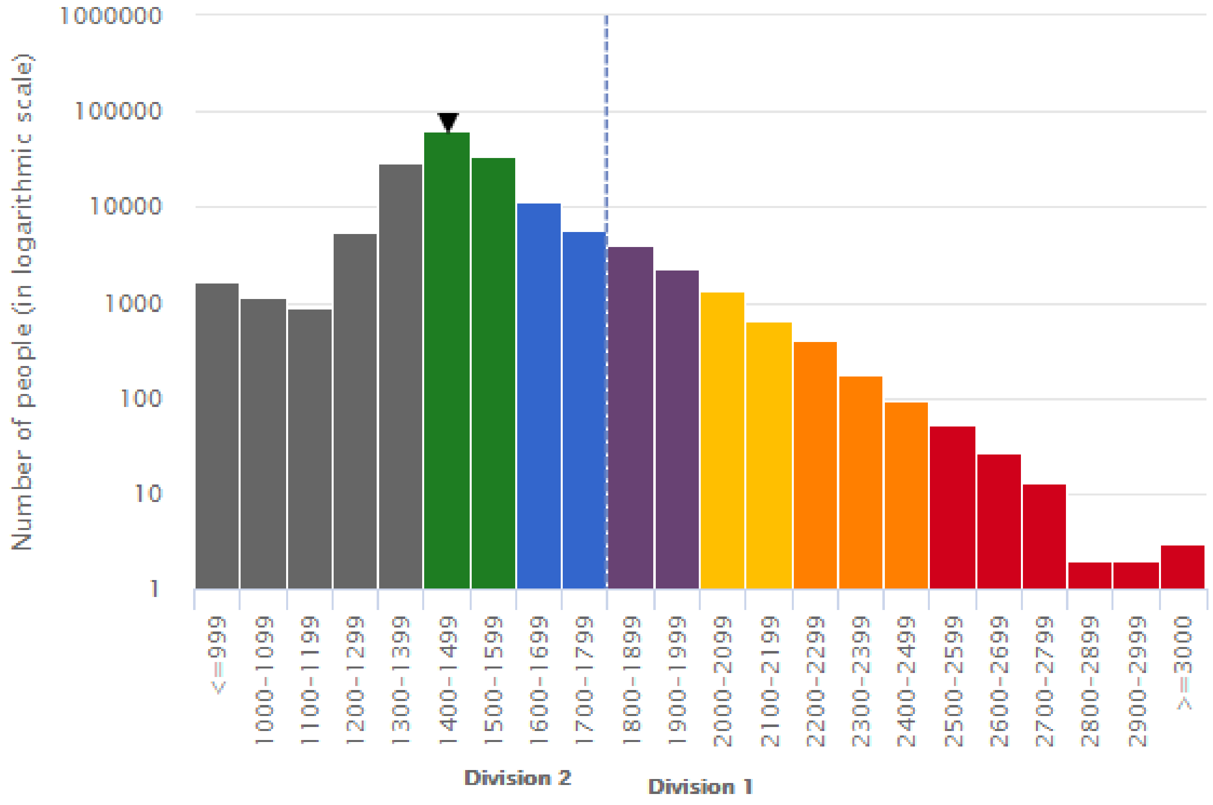
## Solve 3 Project Euler Problems

Solve 3 problems from Project Euler before the Semester End and earn 5 marks

Platform: HackerRank

# Activity 3

CodeChef Rating Distribution



The number of * and rating you earn will fetch you 10 marks .

Recorded at semester end

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# Activity 4

10 marks for Q-box challenge. Template is available on Github.

# Activity 5

05 marks for having your own code library.

# Activity 6

05 marks for Head Damage

# Your Online Presence

Have the following active profiles:

- HackerRank
- CodeChef
- Github

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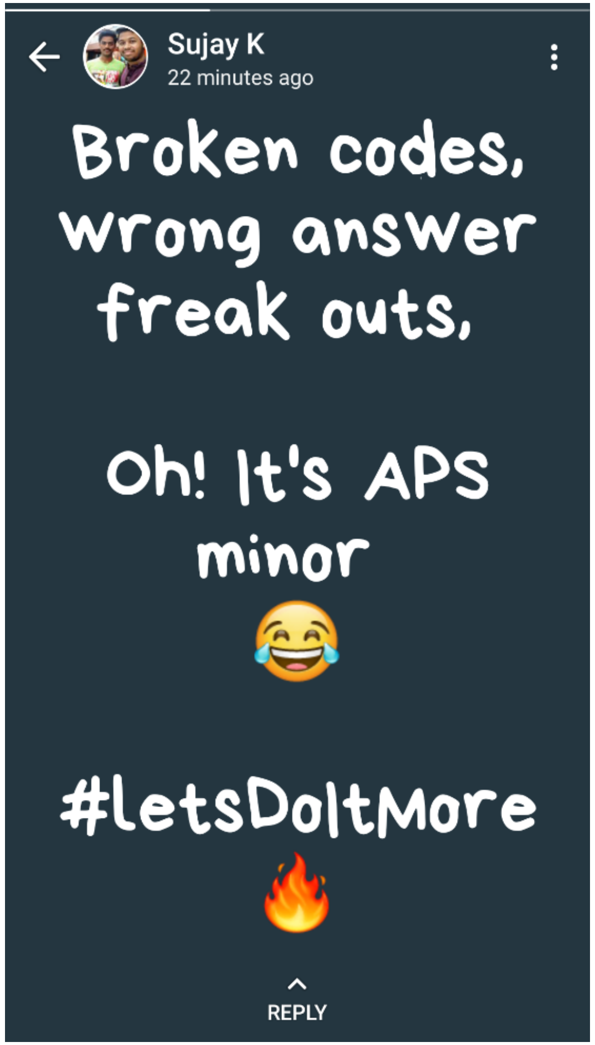
# Experiences

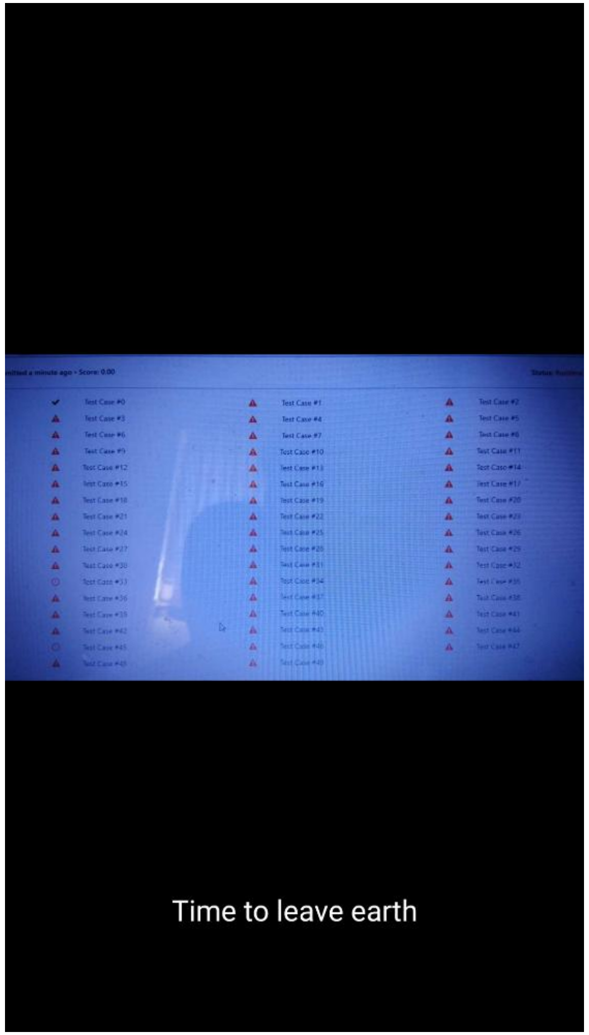


Sujay K
22 minutes ago

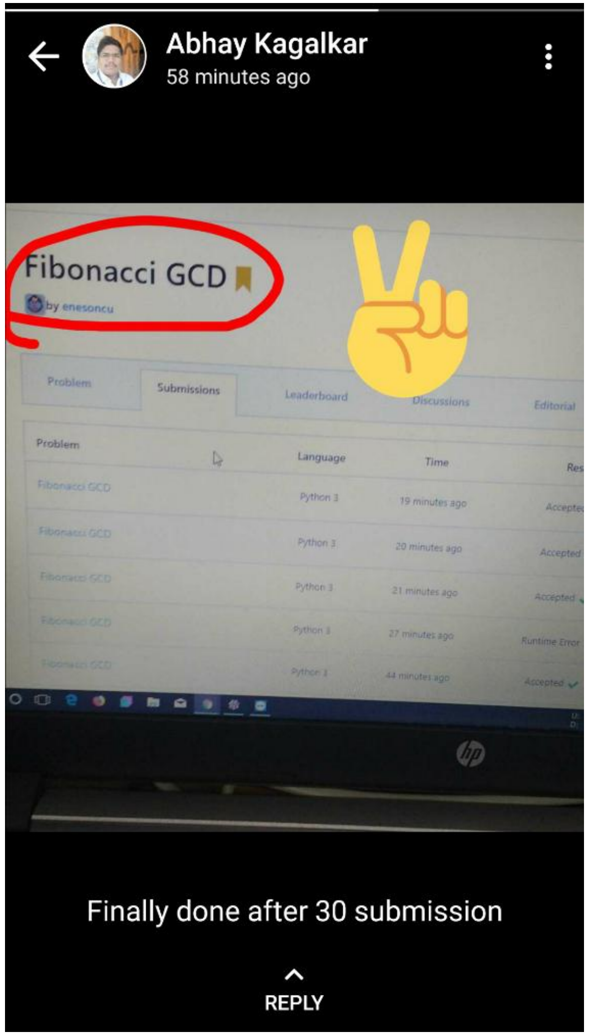
Broken codes, wrong answer freak outs,

Oh! It's APS minor 😂

#letsDoItMore 🔥



Time to leave earth



Abhay Kagalkar
58 minutes ago

Fibonacci GCD

by enesoncu

| Problem | Language | Time | Res |
|---|---|---|---|
| Fibonacci GCD | Python 3 | 19 minutes ago | Accepte |
| Fibonacci GCD | Python 3 | 20 minutes ago | Accepted |
| Fibonacci GCD | Python 3 | 21 minutes ago | Accepted ✓ |
| Fibonacci GCD | Python 3 | 27 minutes ago | Runtime Error |
| Fibonacci GCD | Python 3 | 44 minutes ago | Accepted ✓ |

Finally done after 30 submission

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# Acknowledgements

Thank you

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