Algorithmic Problem Solving

Init
2019

PH

KLE Technological University

Creating Value
Leveraging Knowledge

Algorithmic
Problem Solving

Hello There!

17ECSE309 Welcomes you.

What do you think are we doing?

Algorithmic - Problem   Solving

or

Algorithmic   Problem - Solving

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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!

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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

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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

https://www.comp.nus.edu.sg/~cs3233/

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

If you have any other reason,

- You love to code

Shut Up!

- Its fun!

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- **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

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- **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

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- **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

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Then There is a Problem

- **A Competitive Programmer**

  - Solves the problem in about 30 minutes without any mistakes

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- Methods to solve

- Methods to solve efficiently

- Methods to solve quickly

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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**
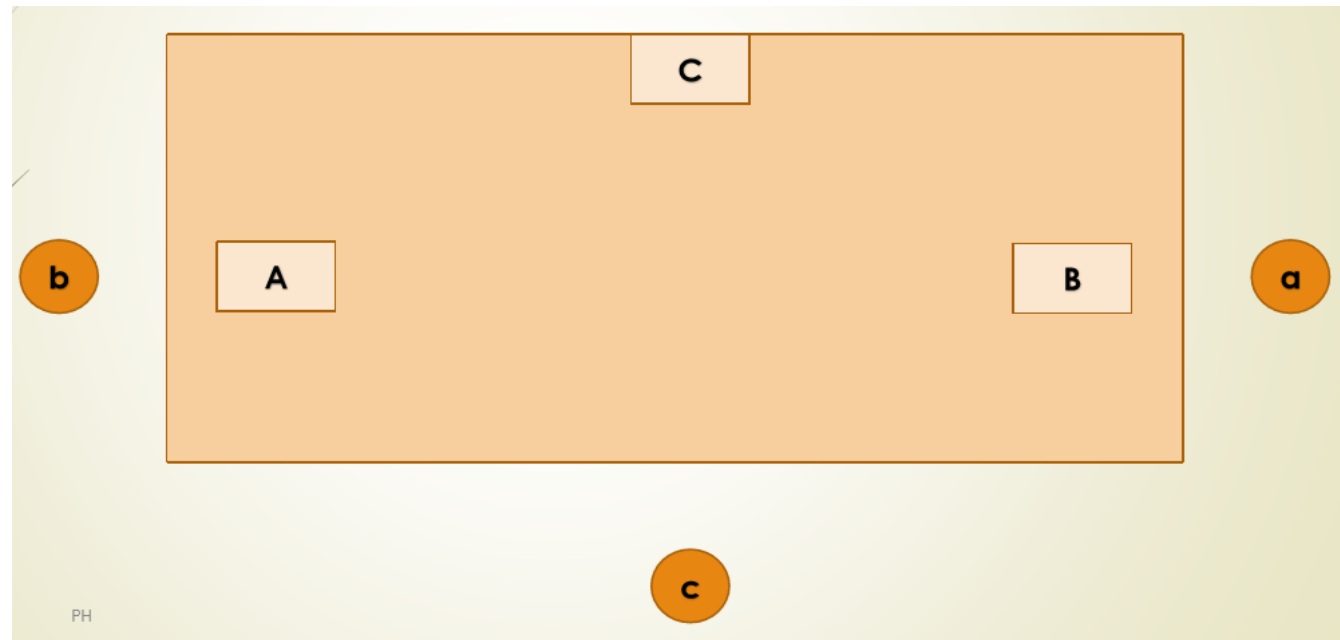
Method to Solve Efficiently

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

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- 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

Course CIE and SEE

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

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21 days makes a Habit
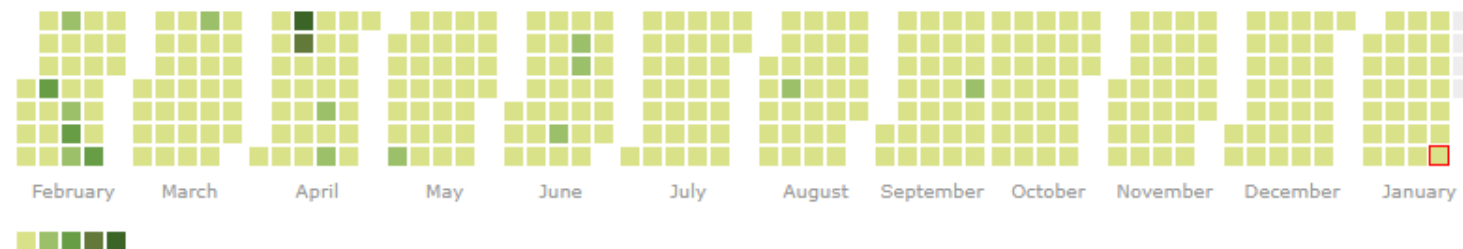
Code on HackerRank for Straight 21 Days and Earn 5 Marks

Prakash Hegade
(@prakash_hegade)

Algorithmic
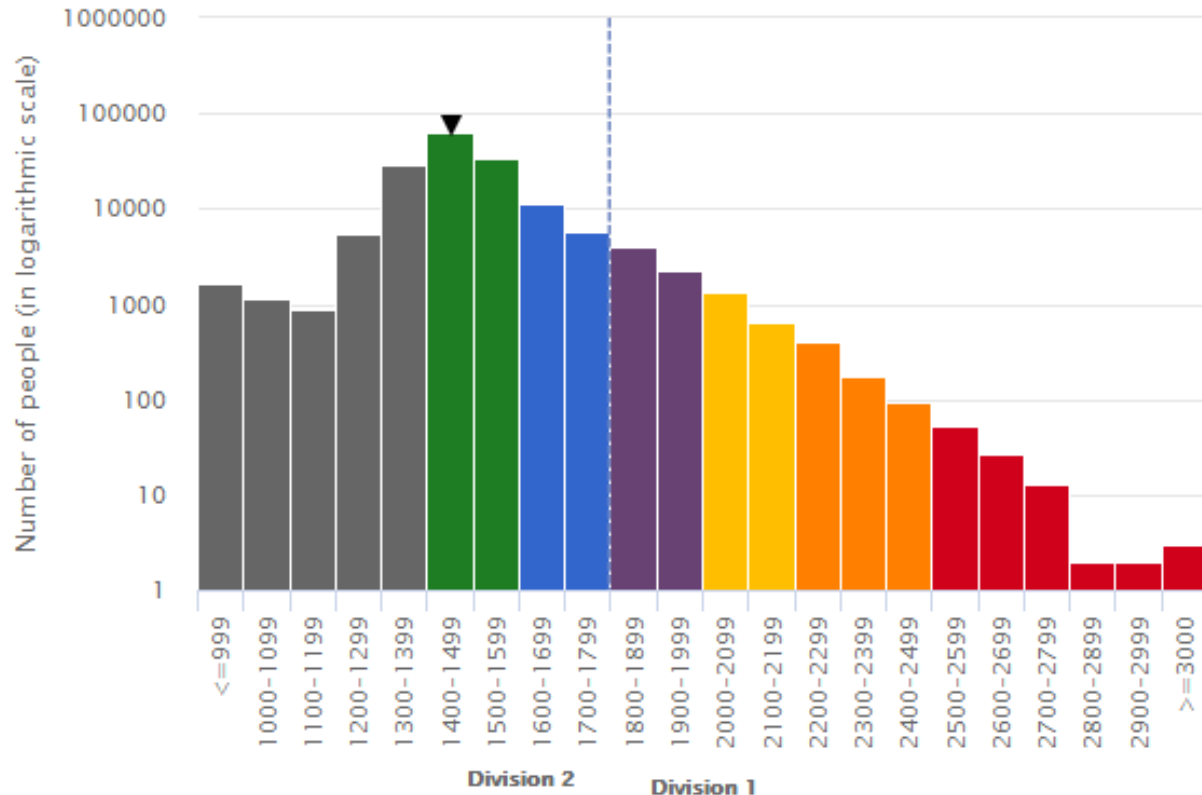Problem Solving

Activity 2

Solve 1 Project Euler Problem

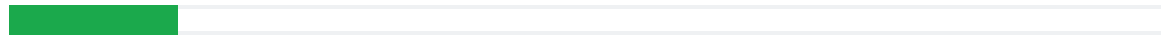Solve the Assigned Problem before the Semester End and earn 5 marks

Platform: HackerRank

CodeChef Rating Distribution

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

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1156.47 more points to get your next star!

Rank: **59665** | Points: **1043.53/2200**

Problem Solving ★★★★★

Earning the 'Problem Solving' Ranking of 40,000 or less will fetch you 10 marks

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The remaining 10 marks will be evaluated for the activities conducted during the course tenure which includes:

- Discussion sessions
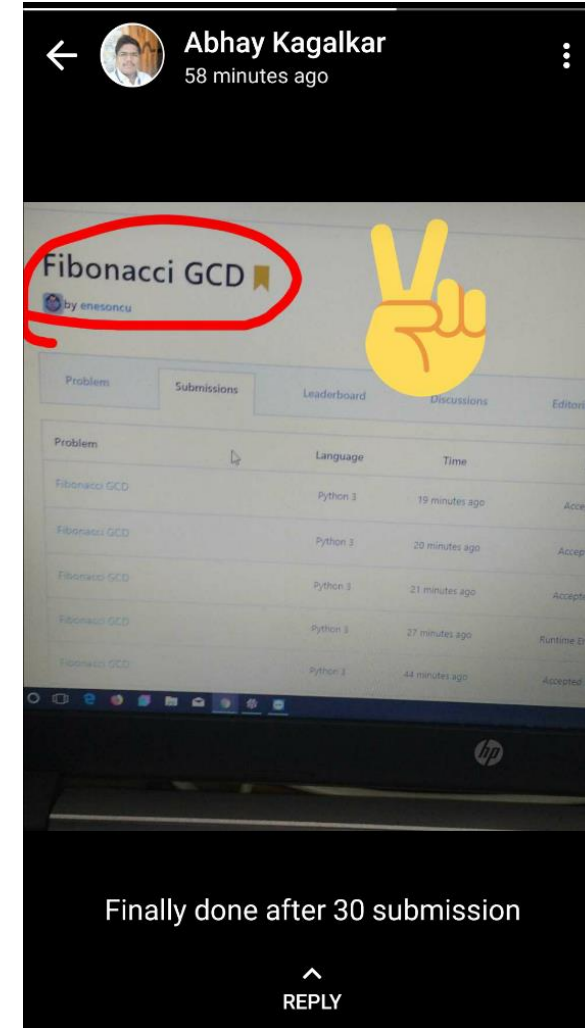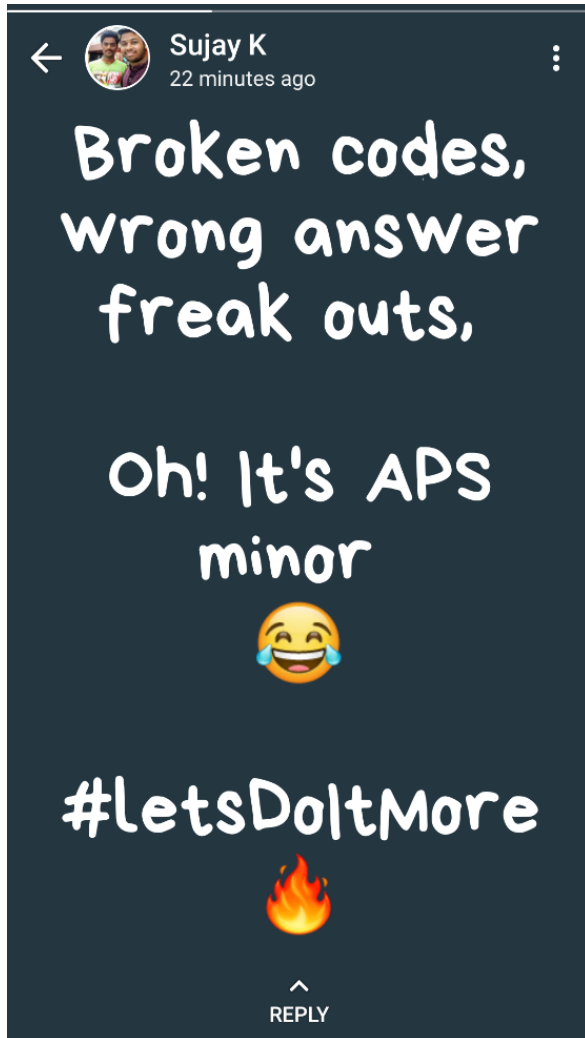- Code challenges
- Reflections
- Any other activities

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Your Online Presence

Have the following active profiles:

- HackerRank

- CodeChef

- Github

Experiences

Sujay K
22 minutes ago

Broken codes, wrong answer freak outs,

Oh! It's APS minor 😂

#letsDoItMore 🔥

REPLY

Time to leave earth

REPLY

Abhay Kagalkar
58 minutes ago

Fibonacci GCD

Finally done after 30 submission

REPLY

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Acknowledgements

Thank you