Introduction to CompProg

Gabee De Vera

What is CompProg?

What is CompProg?

- A Programming Competition?

What is CompProg?

- A Programming Competition?
- A Mind Challenge?

What is CompProg?

- A Programming Competition?
- A Mind Challenge?
- A Sport?

What is CompProg?

- A Programming Competition?
- A Mind Challenge?
- A Sport?
- A **Community**

Benefits of Being in CompProg

Benefits of Being in CompProg

1. You get to practice your **programming and mathematical thinking skills**. 💻

Benefits of Being in CompProg

1. You get to practice your **programming and mathematical thinking skills**. 💻
2. Doing well in CompProg Competitions, especially in the International Olympiad in Informatics is very helpful for **college applications**. 🎓

Benefits of Being in CompProg

1. You get to practice your **programming and mathematical thinking skills**. 💻
2. Doing well in CompProg Competitions, especially in the International Olympiad in Informatics is very helpful for **college applications**. 🎓
3. You'll have a lot of **fun** solving problems (at least, I hope you're having fun). 😄

Benefits of Being in CompProg

1. You get to practice your **programming and mathematical thinking skills**. 💻
2. Doing well in CompProg Competitions, especially in the International Olympiad in Informatics is very helpful for **college applications**. 🎓
3. You'll have a lot of **fun** solving problems (at least, I hope you're having fun). 😄
4. Most importantly: you get to meet **new friends** and **like-minded individuals**. 👋

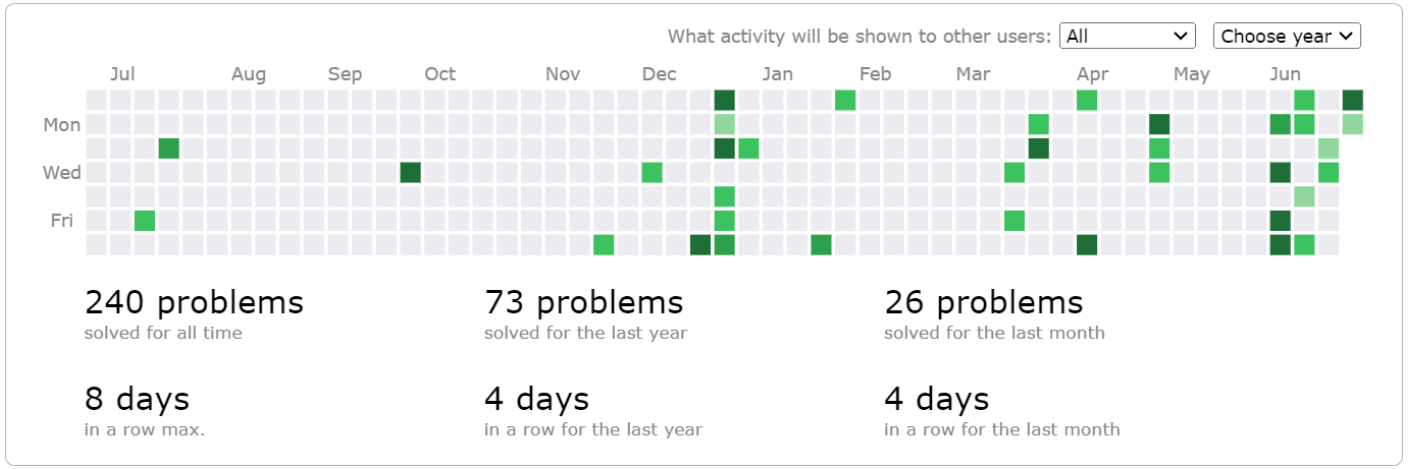
> ***The true AC is the FRIENDS we made along the way***
>
> - Some Competitive Programmer, Probably

Note: **AC** stands for *"all clear"* and is used to signify that a problem has been completely solved.

Strategies and the CompProg Mindset

Strategies and the CompProg Mindset

Practice, Practice, Practice, Practice, Practice!



Getting good at CompProg entails not solving 1, nor 2, nor 5, nor 10, nor 50 problems, it entails solving **hundreds** of problems and joining **multiple competitions** on, eg., Codeforces.

Strategies and the CompProg Mindset

Attack the Subtasks First!

DO NOT make the mistake of going for the full points right away, especially if you're using a **greedy algorithm** (more on this later) or the **problem has many moving parts**.

When in doubt, go for the easy points. It'll be easier for you psychologically knowing you have sure points than worrying about whether or not your **"full point solution"** will pass all test cases.

Strategies and the CompProg Mindset

Be Humble + The Constant Improvement Mindset

This is related to the last point on attacking the subtasks first. Yes, you're in Pisay. Yes, you're smart; however, **don't expect to be able to solve all problems you see**. Know your limits and accept when you aren't able to solve a problem.

CompProg is hard, and **you will fail**, countless of times. Having some **humility** and **acknowledging your limits** will not only help you retain your peace while doing CompProg, but it will also help you realize where you can improve.

Strategies and the CompProg Mindset

Rest

CompProg is not your 24/7 job. Don't let an excess of CompProg affect your **studies**, **family life**, **time with friends**, and, if you're religious, **time with God**.

Take a break (when it's time for one)!

Strategies and the CompProg Mindset

Have Fun!

I hope your primary motivator in joining CompProg is that you **find it fun**! That way, even if you may experience setbacks, you'll persevere in CompProg simply because you find it *fun*.

Resources for CompProg

Getting Started: Readings For CompProg

- NOI.PH Website
- NOI.PH Preparation Guide
- The Competitive Programmer's Handbook
- NOI.PH Learning Guides

Resources for CompProg

Getting Started: Readings For CompProg

- Algorithms for CompProg
- WilliamFiset's Videos on CompProg
- Errichto's Videos on CompProg
- USACO Guide

Resources for CompProg

GitGud™ at CompProg (Practice Problems)

- Past NOI.PH Problems
- Codeforces

Resources for CompProg

GitGud™ at CompProg (More Practice Websites)

- AtCoder
- Project Euler
- CodeChef

Resources for CompProg

GitGud™ at CompProg (If You're Gunning for the IOI)

- oj.uz (For IOI/APIO Problems)
- IOI 2024 Syllabus

Are you Overwhelmed?

Worry not! You are not Alone in your CompProg Journey ^^

Trainer Introduction

Introduce Yourselves!

About Reboot

About Reboot

The Reboot CompProg Division is a student-run training program for PSHS-MC students who want to get their feet wet in the world of **informatics competitions**.

What we'll do in Reboot:

1. **Prepare** you for competitions such as Abakoda, TAMa, NOI.PH, and the IOI. 💪
2. Equip you with **data structures, algorithms, and mathematical knowledge** to succeed not only in these competitions, but also in your future careers. 🧠
3. Provide a **community** within Pisay where you can discuss and interact with like-minded friends ^^

Training Format

We'll have one topic per week with some problems relevant to that topic.

- **Tuesday Afternoon/Evening:** Synchronous meeting (either f2f or online)
- **Friday Afternoon/Evening:** Asynchronous progress updates -- what you accomplished, what you're stuck on (if any), and what you plan to do until the next meeting ~~(yes, this is Scrum, kinda)~~
- **All Other Times: Free discussion** of problems with other Reboot members

Active Participation is expected! We understand you have requirements and try our best to work around the busy Pisay schedule, but we hope you can dedicate around **4-7 hours per week** to solving problems. *We're always here to help if you need it.*

C++

C++

C++ will be our main language of instruction. For Python users, we will still accept Python, but we **strongly recommend** transitioning to C++. You'll need to use C++ later on once you advance far enough in CompProg, anyways.

C++ is a **compiled language**. This means that the C++ source code is first converted to a machine-readable format before executing. Your general flow in writing a C++ program is:

1. **Write** C++ code
2. **Compile** C++ code
3. **Run** C++ code
4. **Debug** C++ code; repeat steps 1-3 until no bugs are found

C++

Here is a C++ **Hello World** program:

```cpp
#include <bits/stdc++.h>
using namespace std;

int main() {
    cout << "Hello World!" << endl;
    return 0;
}
```

More details to follow later!

Setting up your Environment

Windows Subsystem for Linux

Windows Subsystem for Linux

*Note: If you're on **Mac** or **Linux**, feel free to skip this part.*

Windows Subsystem for Linux (WSL) allows you to run Linux on your Windows machine. WSL comes preinstalled with the **C++ compiler**, so setting up will be a lot easier 🎉

If you're on Windows, I **strongly discourage** you from downloading a C++ compiler directly on your Windows machine. Trust me, it is pain 🥲

Refer to this resource *by NOI.PH Trainer Cisco Ortega* for instructions on setting up C++ (and for transitioning from Python to C++ if you're a Python main).

Homework for this Week

For *Windows users only*: **Set up WSL on your computer.**

For *Everyone*: **Write, Compile, and Run a Hello World Program in C++.** Feel free to put any other academically appropriate message there ^^

```cpp
#include <bits/stdc++.h>
using namespace std;

int main() {
    cout << "It's time to start coding!" << endl;
    return 0;
}
```

Follow your Dreams

Images Used

1. https://inspirationfeed.com/wholesome-memes/
2. https://www.etsy.com/listing/1023359285/hollow-knight-hornet-git-gud-sticker
3. https://backiee.com/wallpaper/follow-your-dreams-doge-cheems-meme/241510