

Dear All,

As you know, our *senior-level* guys train hard for several years, but the **performance curves** are stuck very early in a [plateau](#) stage that makes *our performance in OJs and ICPC world finals pretty lower than expectations*. This concern has been in discussion for several years among several seniors. Several of us tried to get some help ([See](#), [See](#), 2010 [Andrey Lopatin](#) Russian camp) [Related [See](#), [See](#), [See](#) - [roadmap](#)], but the overall is the same. Several of us gave up or didn't train seriously for WF level.

Let's focus our **attention** to the problems that are **hard** for our **seniors**. I will assume such problems have levels equal to **TC-Div1** in range [[450-600](#)] points. *This range might include: Hard (TC-Div2-1000, CF-Div2-D), CF-Div2-E, CF-Div1-C, Medium CF-Div1-D, TC-Div1-500.*

- Notice that, majority of seniors can solve such problems **offline**
- They might take several hours or need to see editorials
- But eventually they can get most of them
- So the real issue is to get them **smoothly** in real/online competition

What is behind our case? We used to think about (or get tips that goes around): *Educational System, Think out of the box, Mathematics background, Practice and Practice, Train smart not hard ... etc*

In Dec, 2014, I messaged many TC red coders about the case and got the following reply from Vladyslav Simonenko ([vlad89](#)):

“If they can't go pass rating 2000 in TC, the problem is probably that they do not **challenge** themselves **enough**. For example, did those people solve (in practice room) **all problems** from last **100 SRMs**? The same goes for Codeforces. If the answer is no - then this is the problem. You should **solve a lot of hard problems** before you can become red. Luckily there are enough editorials on both topcoder and codeforces to make this type training quite realistic. The same goes for ACM team training - participate with a **team** in **all virtual contests** in Codeforces, and **finish all problems** afterwards. If they do all above and still stagnating then I would be *really surprised*.”

A very **quantitative** reply. For our target level (level = **TC-Div1-[450-600]**), he seems asking: have you solved 600-800 problems? I asked some seniors about the needed quantity. Answers vary from 200 passing with 400 to ~600.

Before stating my personal reply on the **quantity** concern, let me first refers to 2 other critical concerns that affect our performance:

External Factors:

- Initial intelligence level (genetically determined)
- Bringing up elements
- Education level
- Coaches / Campus level
- Mathematical / problem-solving background
- Availability (workload or lots of exams and assignments)

Training Quality (The training smart not hard dilemma)

- Creating **competitive environment** around you
- Practice as if you are in a **contest** (e.g. get AC 1st submission)
- Learn the most possible from **your mistakes**
 - E.g. Your bugs types & wrong decisions
- Learn the most possible **from others**: editorials, solutions
- Understand your **mind thinking paths** and how to improve
 - E.g. one might log what happens during solving & analyze it
- Avoiding **bad habits**
 - knowing some **problems details** before solving (category, level (e.g. in TC, CF))
 - Focus on **specific judge** or categories (avoiding what you hate)
 - Solving more in the **wrong level** (easy & medium vs the hard target level)
 - Acquiring much **knowledge (breadth)** on cost of mastering topics (**depth**)
 - **Weak theoretical** understanding for the algorithms (practice vs theory)
 - Just solving without attention to **weak skills** (e.g. weak debugging skills)
 - *Note: Coach can offer great help in **problem selection** to avoid students most of them*

You can see that many **external factors** are already against us. Add to that, probably many of us may train improperly (violating **quality** concerns). Self-Discipline is pretty hard!

Back to the **quantity** concern. Given the nature of the external factors and lots of quality challenges, I claim that, seniors in our region need to solve as much as they could (e.g. 600-800 problems) in this level while doing their best to maintain *high quality training*. Let's assume '*the correctness of my claim*' is our way to get out of this dilemma.

Starting by myself, I solved around **1500-2000 problems** during my competitive career. I thought much about the # of challenges I really faced. The answer is pretty low (~**200**). I almost violated all the quality concerns (no one told me, I learned most of them the hard way). I have a mix of *both low quantity and quality*!

I thought about **investigating** the **quantity** answers from our seniors (e.g. # of solved problems across **all** judges (online/offline) in the level **TC-Div1-[450-600]**). See [here](#).

Seems the **quantity** is pretty low for the **majority** of us. According to my claim, weak performance is expected. The few guys with the highest records are mysterious for me. However, it is pretty hard to investigate the **quality** concern too. I think that some of the current seniors are better than my generation, however given the amount of available materials/experience vs our days, it is still a small shift.

Finally, if you agree with me:

- For **seniors**: Put a big goal. For example, by end of 2017, I target solving 700 problems in level TC-Div1 [450-600]. I wish by end of 2017/2018, we have several seniors worked within this level. We then can examine if **subset** of them will bypass this endless obstacle or not.
 - Surprisingly, some seniors solved like 2200 problems, only 200 of them are hard!
- For **coaches**: Please shift much of your attention to what level your trainees solve.
- For **juniors**: You are in a similar trouble. Many of you solve too many useless easy problems and keep struggling. Some guys solve around 800 problems and still suffer from Div2-C. It seems most of us (juniors and seniors) **fail to select the right problems** to tackle. Please, ask a coach or follow a sheet to avoid this repetitive issue.

Few more words about our performance in world finals. Typically in our region, students reach ICPC when they are graduated. That means they are busy in work. Sometimes, things are more harder when the team members work in different countries (I was in Egypt, Yasser in Dubai and Ahmed Aly in USA). This makes always the WF training **ineffective**. Also, some of finalists feel we are done with the challenge. They are finalists anyway. They actually **don't train reasonably**. So overall competition between region finalists is weak. No wonder that we still suffer in the ICPC. I hope we get people much earlier to world finals. I wish they consider it a real challenge to break.

Acknowledgment: Thanks for seniors estimations. Thanks for some of them for the discussions.

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