**Mathematical activities**

Klotski number game, a Chinese traditional game, 是一个n阶数字阵 with one space. The position of numbers are disorganized and the player needs to recover it.

* How I know the game: I discovered the game when I was watching an episode of Super Brain, I found this game of Klotski.
* Math Problem related: Once I found one puzzle extremely hard to solve, where only two numbers are displaced and I only need to switch the positions of 14 and 15, I tried for almost half an hour without any progress. I began searching online for method to solve this problem. I initially play this game by ordering the numbers line by line till the last two. I was first amazed by the method of depression of order: first complete the outmost orders to make it become a 3\*3 matrix, then continue to make it become 2\*2. I tried this method on that unsolved puzzle, but the outcome was frustrating.
* The concept of Inversion in a sequence: the parity of the number of inversions determines whether a Klotski puzzle is solvable.
* Why “enjoy”: the rules are easy to follow, with millions of permutations, so that you are actually playing a new game every round. That kind of novelty makes me excited about every round and stimulates me to keep solving different puzzles.
* Why “enjoy”: having a sense of competition when I want to exceed my best record.

1. The relationship with Math—logic & inference

* 考验思维能力&速度
* 推理的过程
* 努力完成一个纯粹的目标的过程

1. 为什么有趣

* 规则简单，组合多变🡪 novelty🡪 刺激感
* 解开的快感&好胜心

**Non-mathematical activities**

U-CODE (girls’ coding movement, a service):

* Woman’s rights: empower girls with coding skills to explore boundless potential in STEM
* Why coding: learn from scratch (have any difficulties in learning?); in the words of Steve Jobs, “Everyone should learn to program a computer, because it teaches you how to think.”  Programing is a language connecting the future and the present.
* Why U-CODE: immersed in bilingual teaching and guide the girls from local schools to explore and learn coding and computer science; to break the stereotype and limitation of gender, and stimulate the boundless potential
* Our Service: the education of coding and CS is not popularized in many areas and region of China, even no guidance and opportunity for students to be exposed with; we’re dedicated to promoting the availability of pragmatic CS education, nurturing the ability of independent thinking, and collaborating to design for peace, innovation and a sustainable future together
* It’s often much more difficult to transfer what you’ve learned to others and make them understand it. To teach does not need one to be a master in some field; it’s a process that you impart your knowledge into others at a lower level, or inspire others to acquire at the same level.

As a core member of U-CODE movement in our school, I always hold the believe that programing is the language connecting the future and the present. In the words of Steve Jobs, “Everyone should learn to program a computer, because it teaches you how to think.”

The education of coding and CS, however, is not popularized in many areas and region of China, even no guidance and opportunity for students to be exposed with.

U-CODE movement is such a service to help with the promotion of girls’ coding. We all members aim to empower girls with coding skills to explore boundless potential in STEM. We are dedicated to promoting the availability of pragmatic CS education, nurturing the ability of independent thinking, and collaborating to design for peace, innovation and a sustainable future together.

However, all of us learned coding from scratch. In order to make sure that we were able to teach other girls, along with self-study and peer teaching, we made approaches to different organizations for sponsorship in order to get a professional teacher. After a month’s striving, a company in Shanghai responded us and sent us an Indian teacher to teach us two hours a week. With the availability of outside help, as well as our own efforts, we finished all the introduction courses within one semester.

We did all of this to provide the opportunity of learning coding to those girls from local schools. Immersed in bilingual teaching, those girls are guided to explore and learn coding and computer science; to break the stereotype and limitation of gender, and stimulate the boundless potential.

It turned out to be much more difficult to transfer what I had acquired to other girls and make them understand it. Those ways of conveying ideas that sound so easy and natural when we are learning coding seem to be so hard for us even to repeat now. Our teacher was patient enough to help us. And when we all managed to teach others with an interesting analogy or an easy-to-understand real-life example, it seems that to teach does not need one to be a master in some field. It is just a process through which I impart my knowledge into other people, or give inspiration to those at the same level.

**Mathematics outside school**

1. Online courses

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1. Advanced training

I have joined multiple advanced training sessions for two years. The content also varies a lot from sequence and series to equations and inequalities; from trigonometry to conic sections.

1. Independent study

I self-studied all the high school content using the senior high school textbooks.

1. Summer program?

Relativity & Quantum Mathematics?