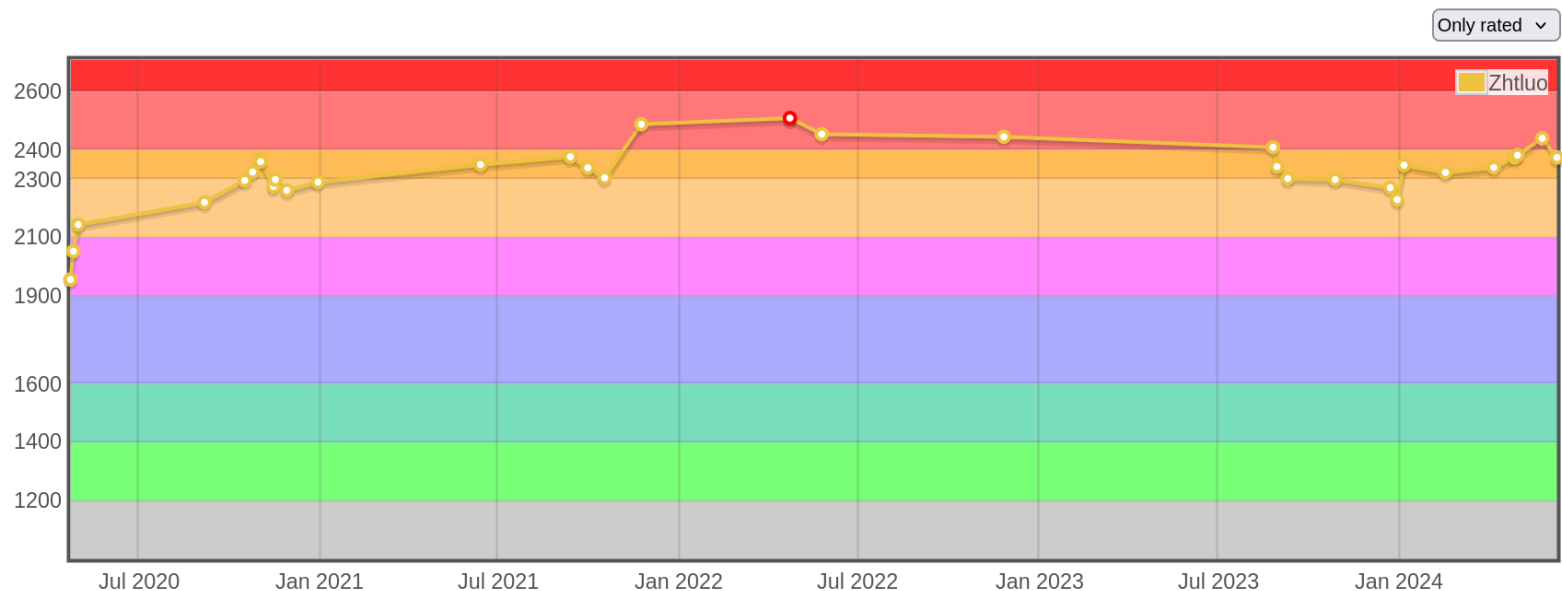


Topic ① : Introduction,  
Implementation.

Self - Intro

ZHONGTANG LUO (ZHTLUO.COM)



Date	Contest	Rank	Team	Score	Prize
04 Apr 2019	<a href="#">ICPC 2019 World Finals</a>	19	Shanghai Jiao Tong University (Manual/Intelligence): <a href="#">Enze Sun</a> , <a href="#">Xiaohan Mao</a> , <a href="#">Zhongtang Luo</a>	7/11	
19 Apr 2018	<a href="#">ACM-ICPC 2018 World Finals</a>	③ 8	Shanghai Jiao Tong University (Nightfall): <a href="#">Boning Li</a> , <a href="#">Wenda Qiu</a> , <a href="#">Zhongtang Luo</a>	7/11	\$6000

What will this course be?

Competitive Programming

- ICP C

- Codeforces

Pop Quiz (B Road Band)

What will this course be about

Basics 000  
000

Claim: mastering CP1/2 is generally  
enough for NAD (Purdue ICPC)  
Codeforces Masters.

What will this course be about

Basics 000  
000

Claim: mastering CP1/2 is generally  
enough for NAQ (Purdue ICPC)  
codeforces masters.

We are going to practice a lot 0  
0

## Assessment: Thursday Contest

- You have 90 minutes to solve 3 problems in class. Problems solved in class net 2 points.
- However, you are not required or expected to solve every problem in class! You may bring unsolved problems back home and upsolve them as homework before the due date. Every problem nets 1 point as homework.
- As a rule of thumb, you need **4 points** every week for an A, and **2 points** every week for a P over 12 sessions. **2 lowest performances are dropped when calculating the grade.**
- **Arriving more than 10 minutes late or leaving more than 10 minutes early without being excused counts as missing the class.**
- **Print your own template for the next session!!!**

# Grades

(Almost) entirely based on contest & resolves.

★ The grade mode change & drop deadline for  
this 12-week course is earlier <sup>!!!</sup><sub>!!!</sub>

(6 extra credits available)



Syllabus Read...

Course Sign-up

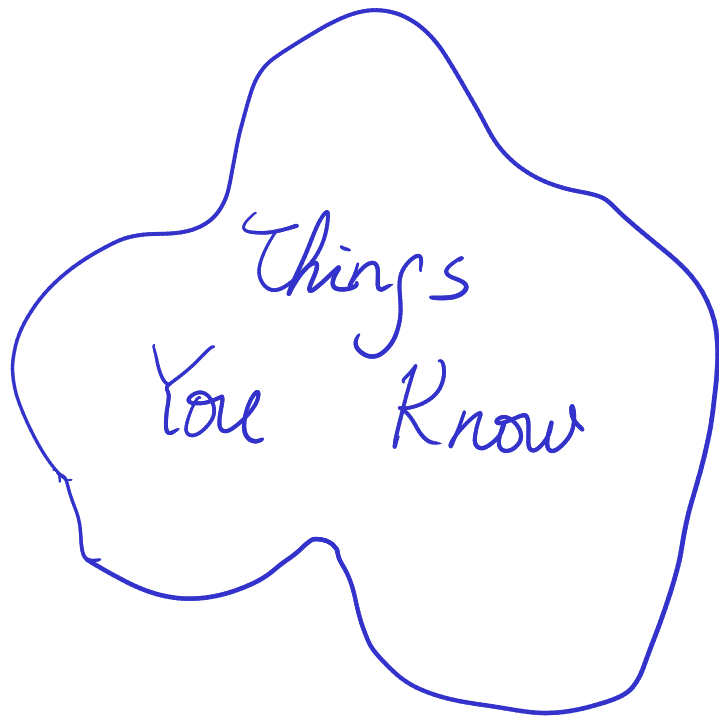
Codeforces for contest

Ed for discussion.

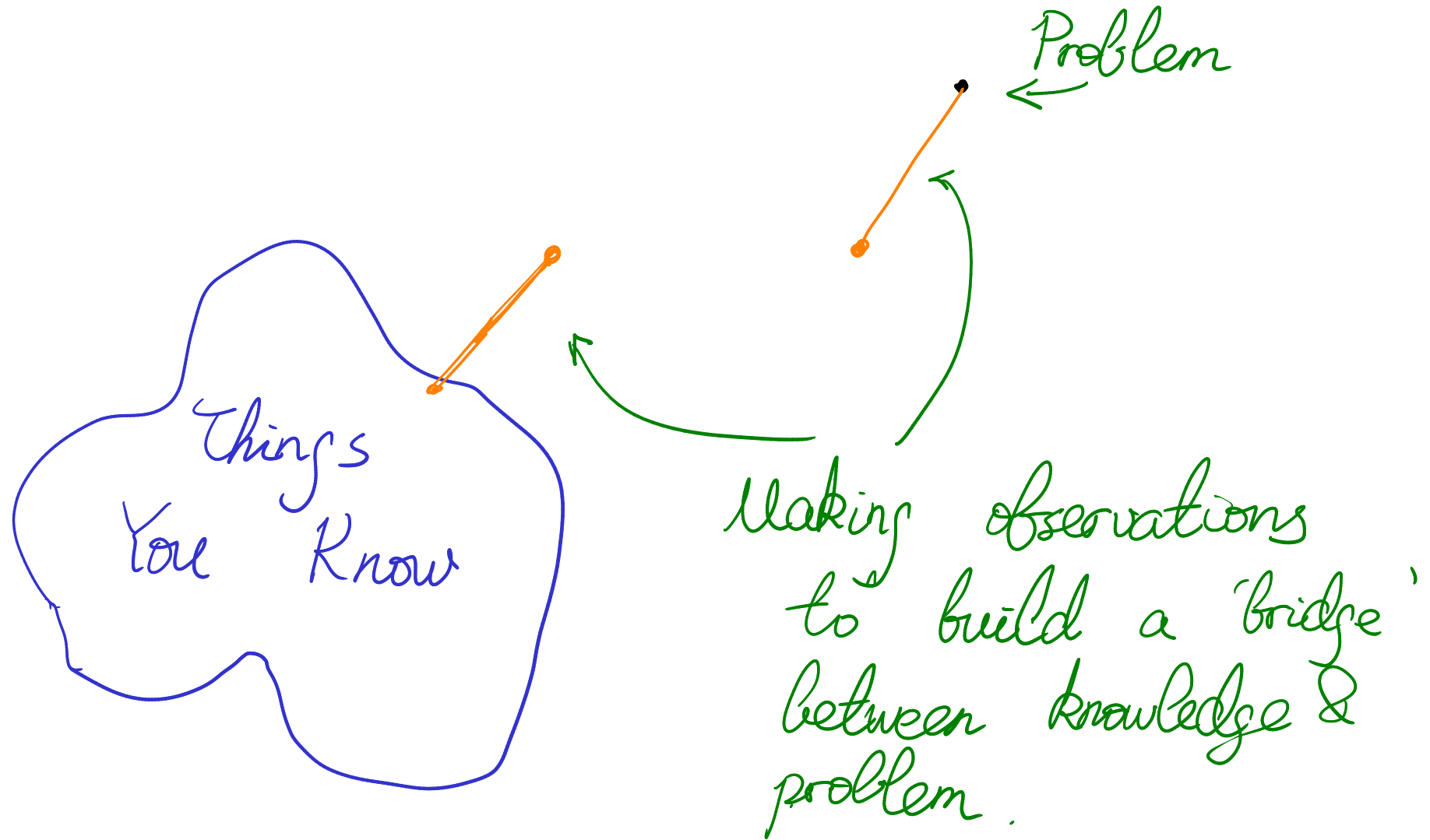
Google Doc for grade sheet

Problem gets solved by repeating observations

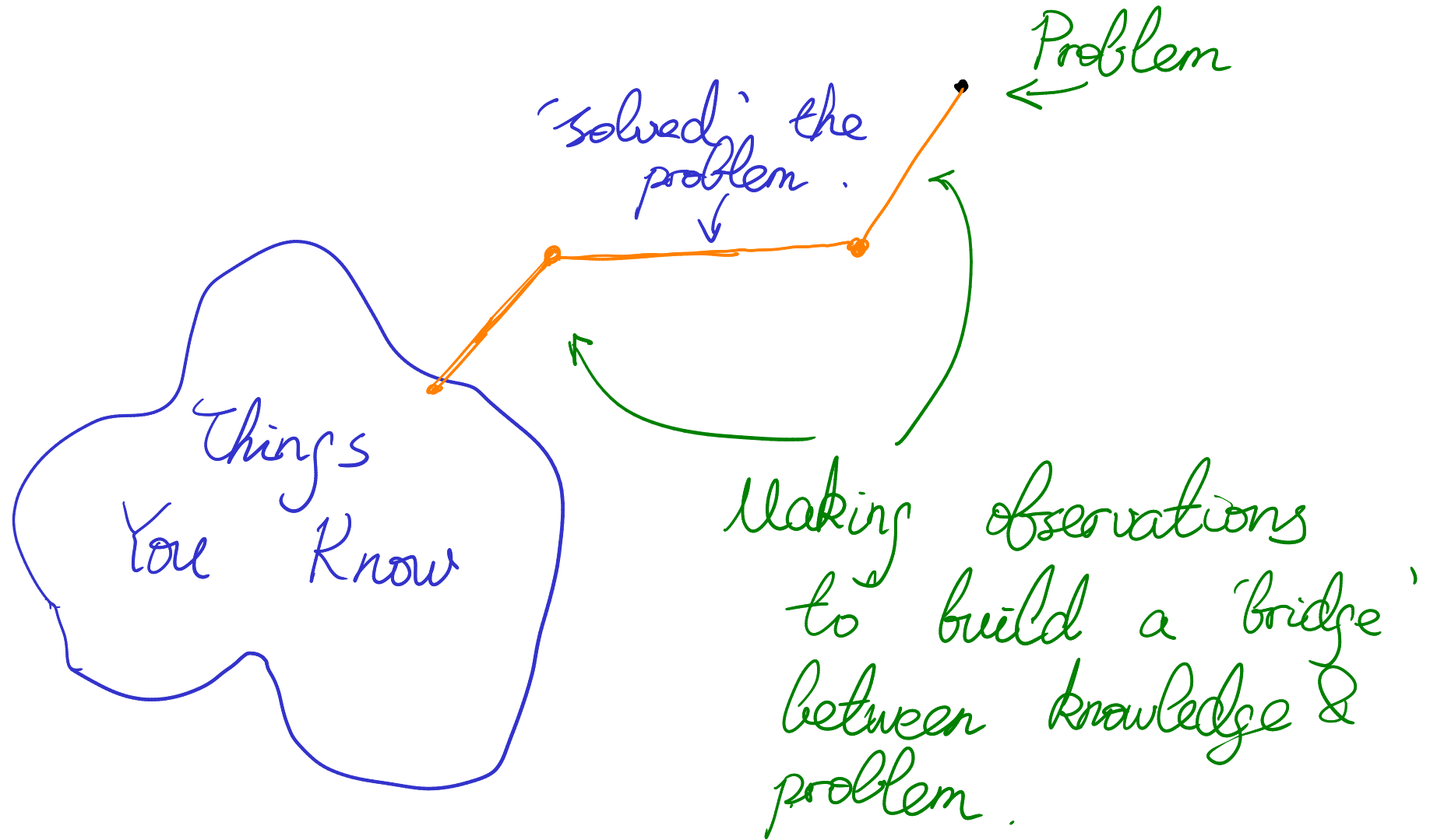
• ← Problem



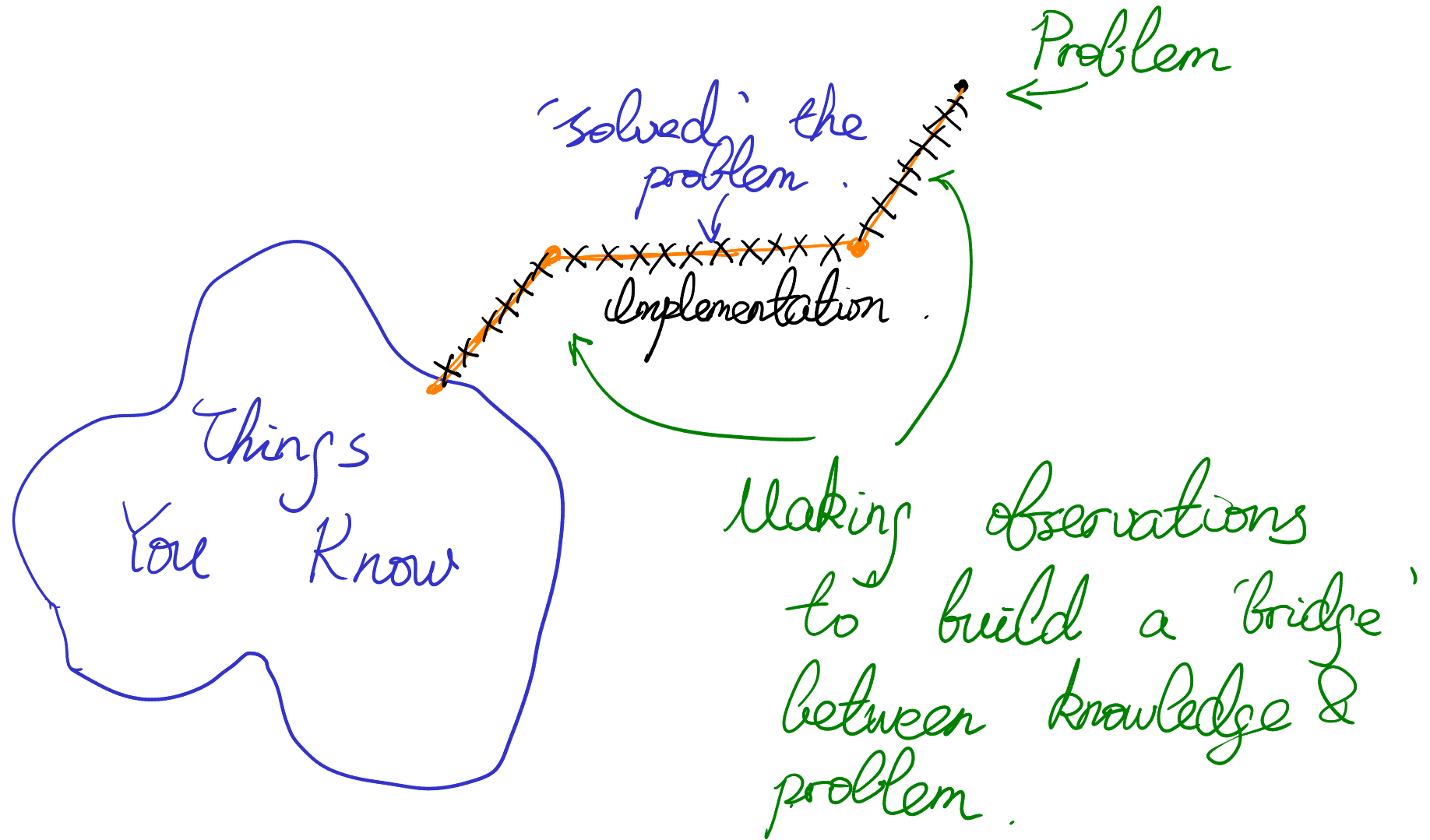
Problem gets solved by repeating observations



Problem gets solved by repeating observations



Problem gets solved by repeating observations



To become better at solving problems...

1. Become better at making observations

2. Know more techniques

3. Become faster at implementation.

Problems reflect these archetypes...

# Mathematical Problem

Observation: How do I look at  
a problem and come up with ideas?

# Cyclic Substrings

Technique: How many things do  
I know?

How many things do I not  
know?



# LCPC Ranking

Implementation: How fast / accurate can  
I code xxx?

How can I improve the speed / qual.  
of my code?

Contest structure for this course

Every week

| Easy problem to review

| topic-specific problem

| implementation / geometry

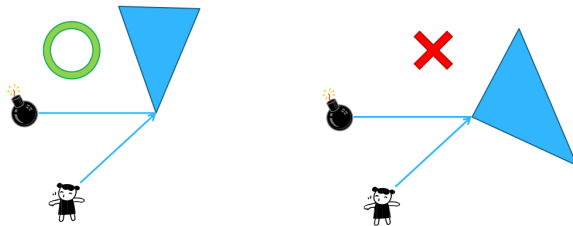
We will have both impl. and geo  
next week.

Alice and Bomb (Geometry)

# Alice and Bomb (Geometry)

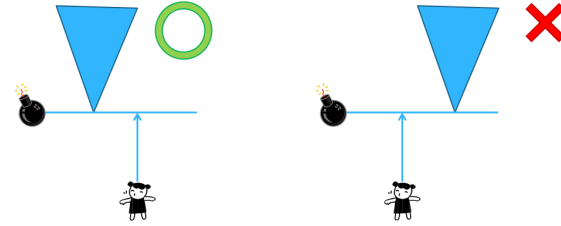
## 終点の候補(1)

\* 多角形の頂点



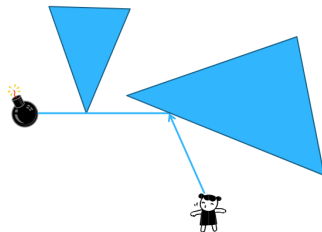
## 終点の候補(2)

\* 垂線の足



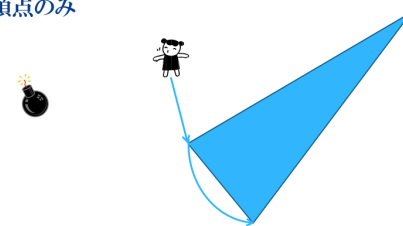
## 終点の候補(3)

\* 交点



## 経由点の候補

\* 頂点のみ



# Concerns from last semester

- More lectures!

We only have 1 prob / topic.

Very hard to increase lecture without more work load...

- Course requires sth. I don't know!

Every week we have review material on our webpage  
The easy problem also tends to review the material.

- I spend 20 hrs every week!

Office hours

Email me.

# How to Be Good

Prep.

- Be good at CP1
- Be OK at CP2

Do Codeforces and UCup

- Join CPU

Upsolve probs after contest

Make liberal use of office hours!

First thing out of syllabus . . . (Sumdoku)

First thing out of syllabus ... (Sudoku)

What is the complexity of searching through Sudoku?



First Thing out of Syllabus ... (Sudoku)

What is the complexity of searching through Sudoku?

Thesis of proof-by-AC:

In CP you don't get point by proving the perfect algo; you get point by throwing together a code that happens to work on the test case.

30 min code with 60% AC > 30 min proof + 30 min code with 100% AC.

Collary (Time Complexity).

CP1  $< 10^8$  computations  $\Rightarrow$  CP3  $< 10^{10}$  is worth a try!

Collary (Correctness)

You can guess anything that looks more correct than wrong.

This Thursday...

First contest!

- Laptop + Reference

- Be prepared for geometry