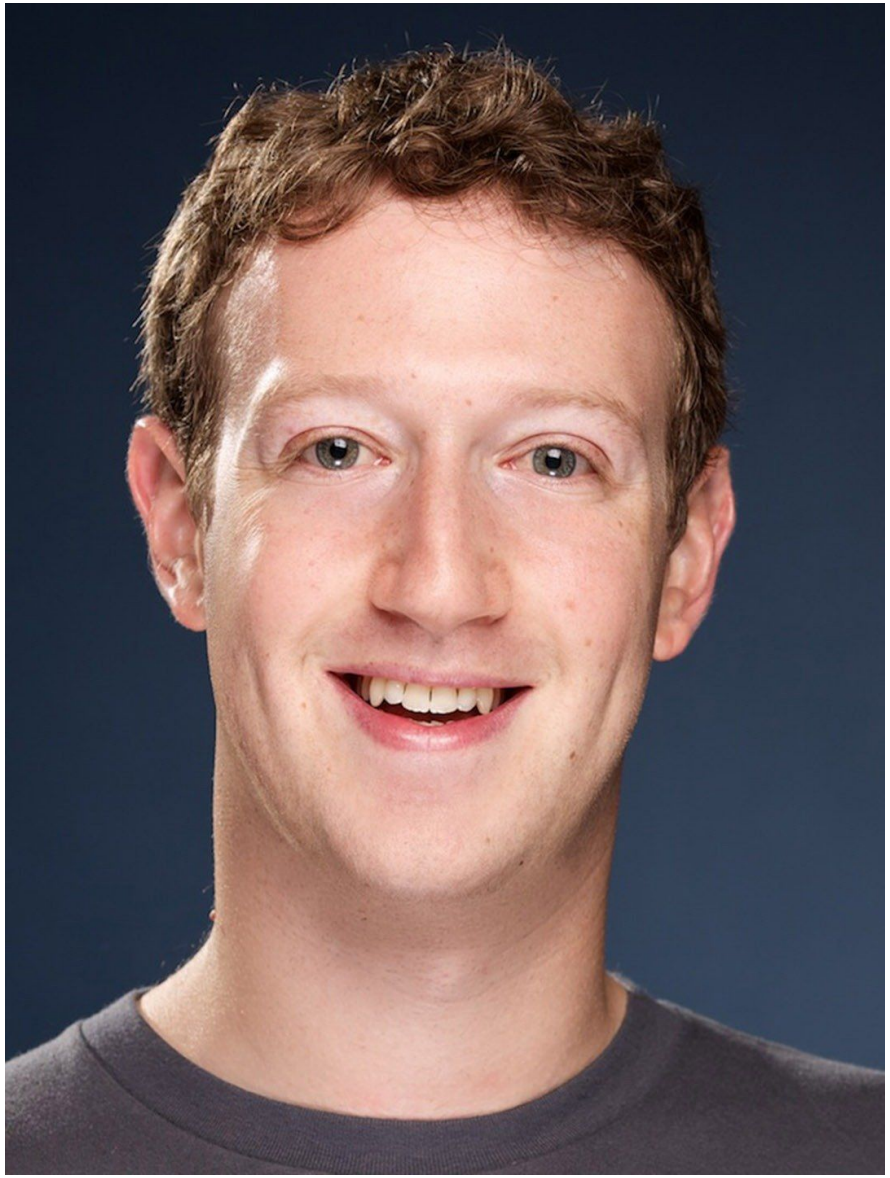
Introduction to Competitive Programming

- Bhavik Dhandhalya

What is Competitive Programming ?

1. Mind sport
2. Contestants are referred to as sport programmers
3. Competitive programming is recognized and supported by several multinational software and Internet companies, such as Google and Facebook.

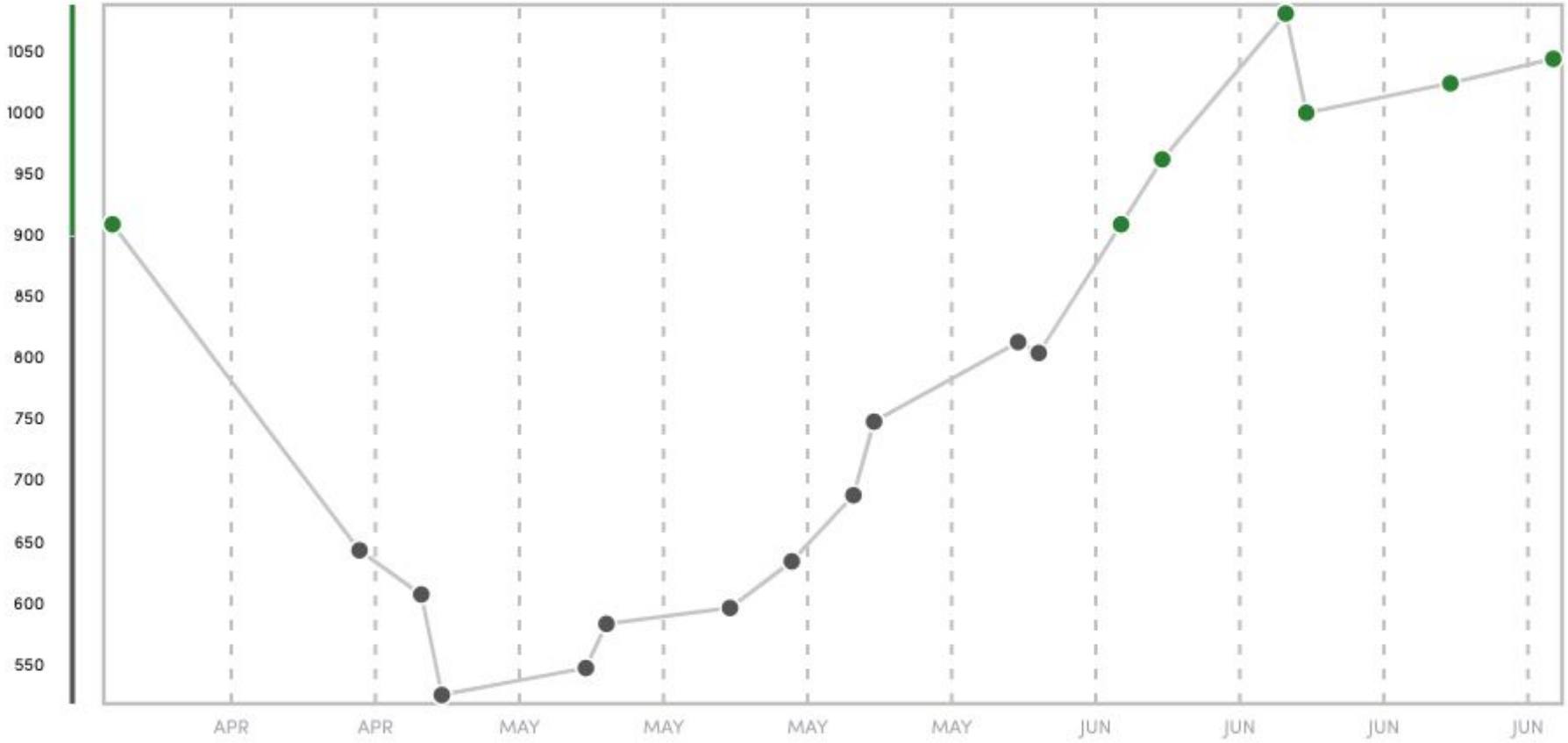


CEO at Facebook

1,044	0	0	18	271
RATING	RANK	PERCENTILE	COMPETITIONS	VOLATILITY

Rating History Graph

VIEW RATING HISTORY | VIEW RATING DISTRIBUTION



Mark Z's topcoder performance

CEO at Quora

dangelo

UNITED STATES

MEMBER SINCE JANUARY, 2002

DATA SCIENTIST

FORUM POSTS

SKILLS

Advanced Math

Brute Force

C++

Dynamic Programming

Geometry

Graph Theory

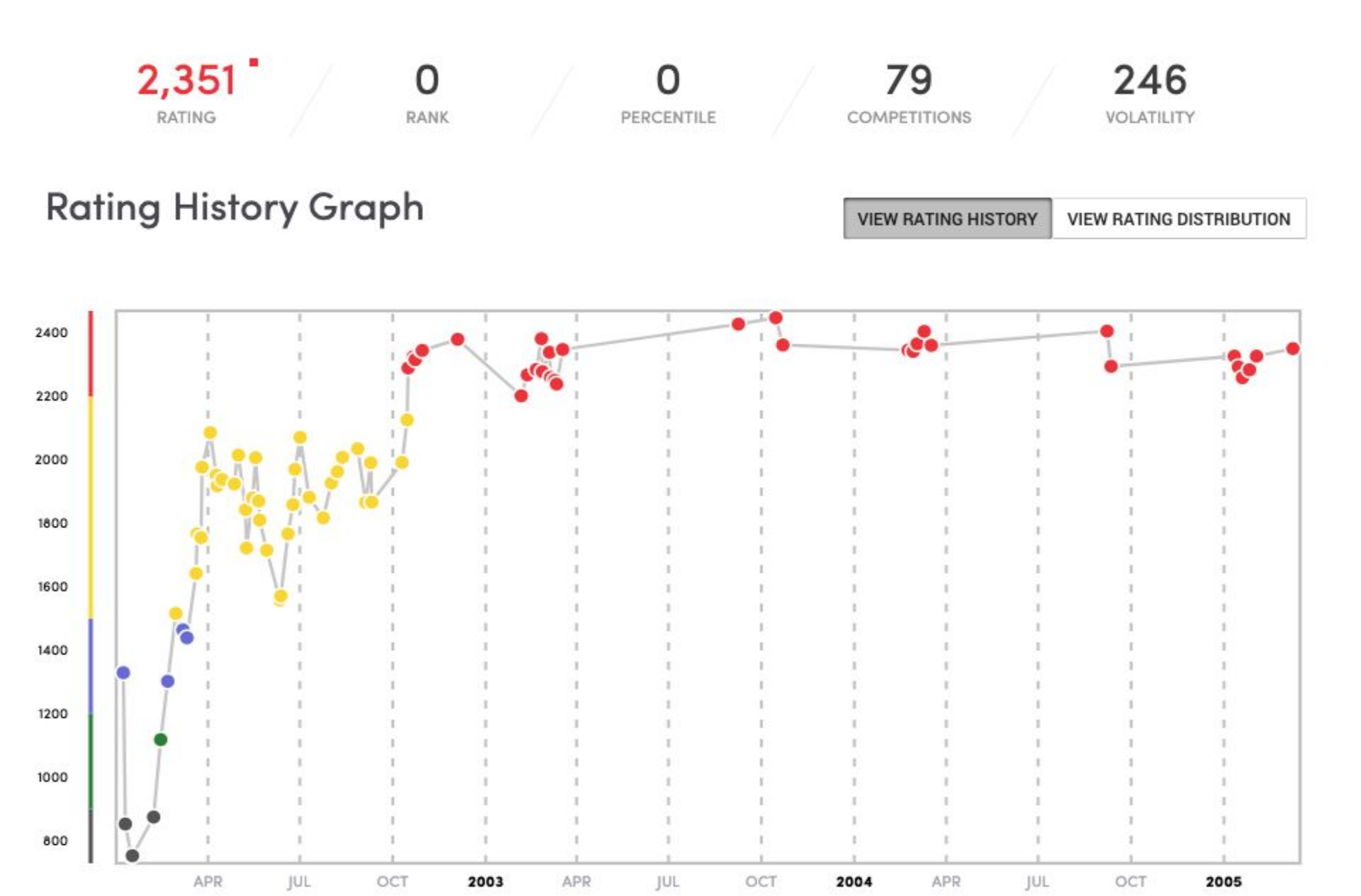
Greedy

Math

Recursion

Search

VIEW ALL



Adam’s topcoder performance

```
  if(s[i] == '}')
    count--;
  else if(s[i] =='{')
    count++;
  else
    if(count==1)
      here[s[i]] = true;

  i++;
}

i=at+1;
count=1;
while(count > 0) {

  if(s[i] == '}')
    count--;
  else if(s[i] =='{')
    count++;
  else
    if(count>=2)
      if(here[s[i]])
  out[s[i]] = true;

  i++;
}
```

Adam's Code

1. Elon Musk
2. Bill Gates

(read more about them on Quora)

Why CP? Why Algorithms?

1. Human Brain complex algorithm ever existed
2. Chess player
3. Poker player
4. AI / ML
5. Job

ACM ICPC

1. Amritapuri Regional 2015
2. Kolkata Regional 2016

Other competitions:

Google Code jam

Facebook Hacker Cup

Online Coding Platforms

1. TopCoder
2. **Codeforces**
3. **AtCoder**
4. **Codechef**
5. HackerRank
6. SPOJ
7. Project Euler (Math)

Online Interview Prep platforms

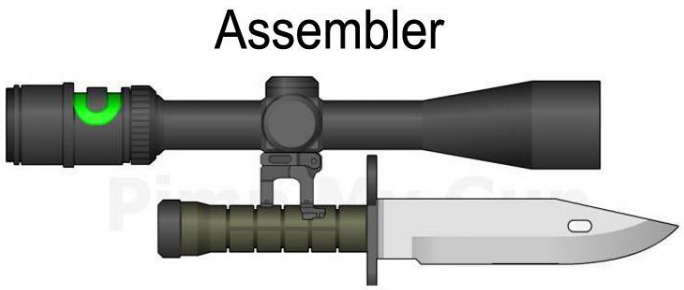
1. LeetCode
2. **Interviewbit**
3. Geeksforgeeks

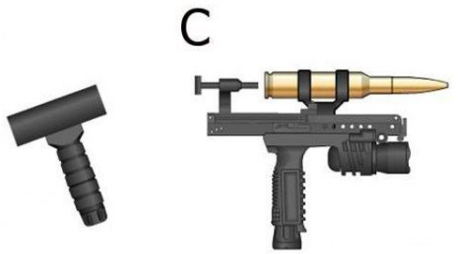
Choose your career path wisely

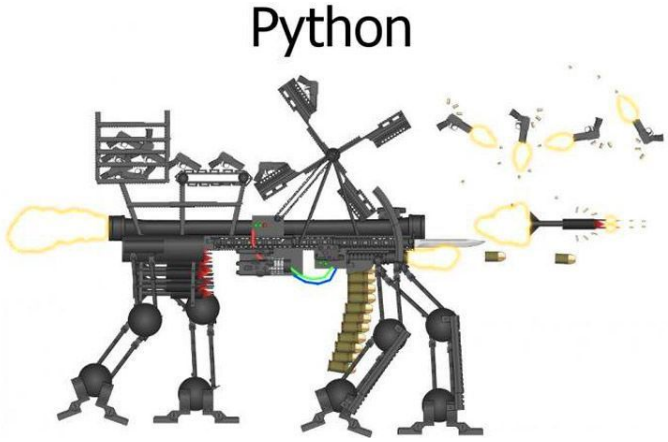
1. Competitive Programming
2. Interview preparation

Programming Languages

~~HTML~~







X > Y means X is faster then Y.

C++ > Go,Rust > Java > python 3

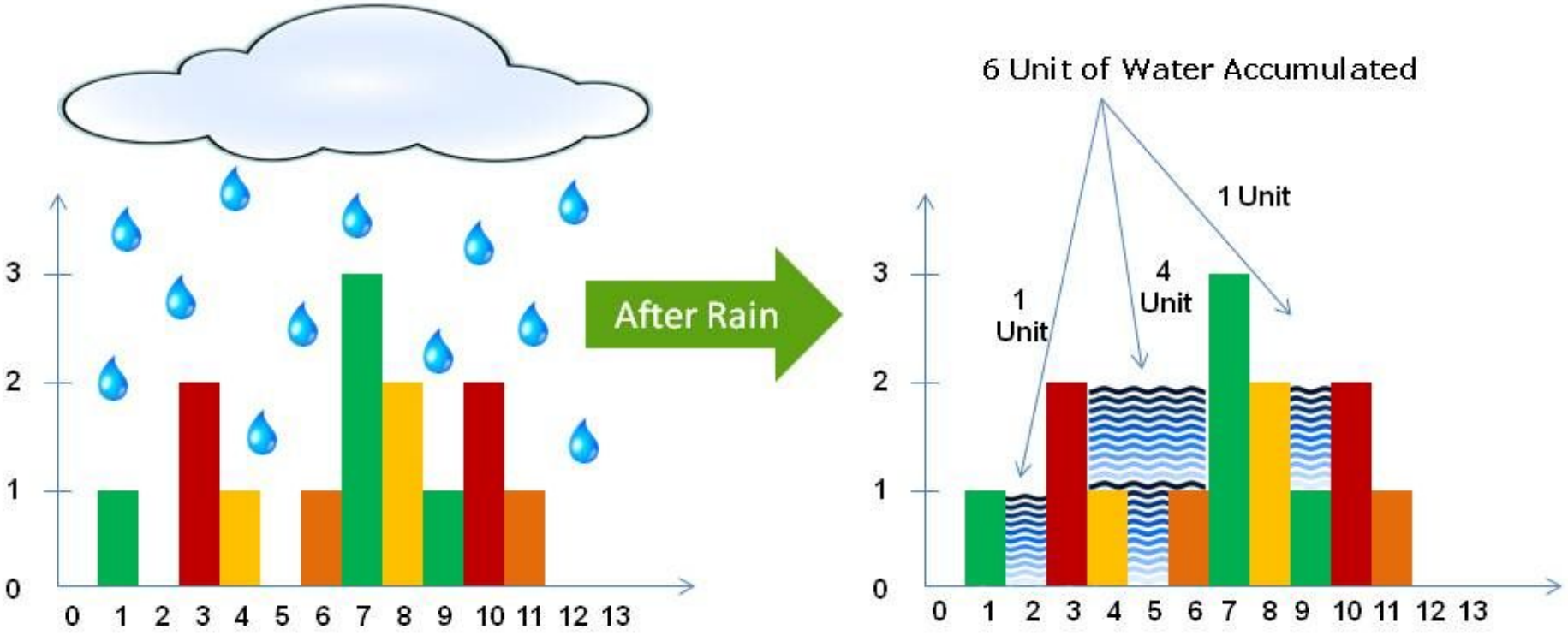
How did Adam D'Angelo improve so fast in TopCoder? (quora link)

1. Get better at parsing input quickly and accurately
2. Learn STL (our 2nd Lecture)
3. Edge cases
4. Algorithms + practice

Course

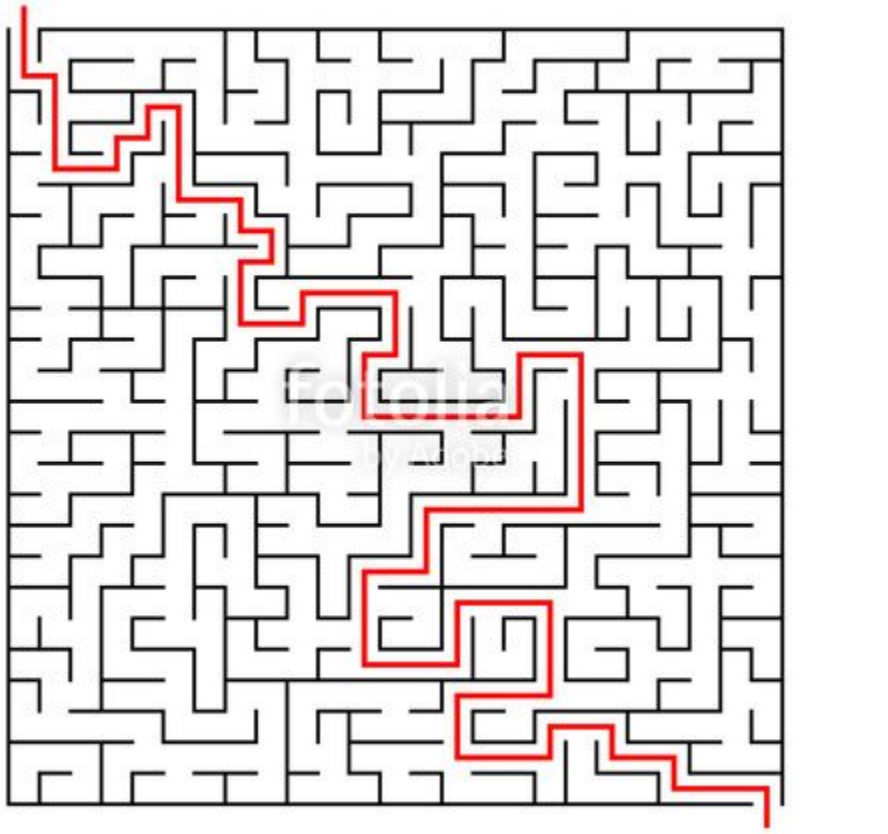
1. STL
2. Data Structures + Algorithms
3. Interview/Competitive Problems

Sample Questions



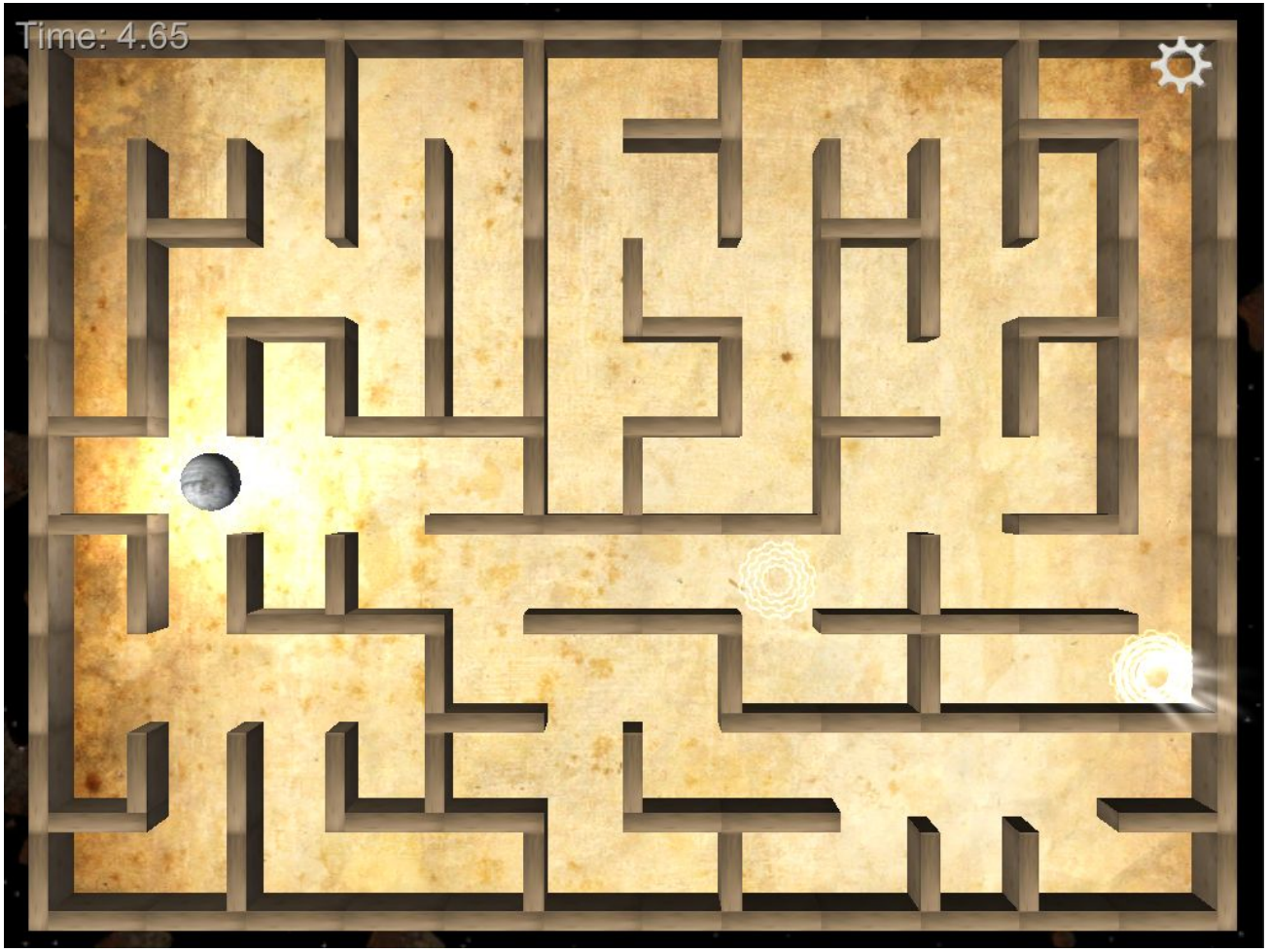
Array Question

Sample Questions



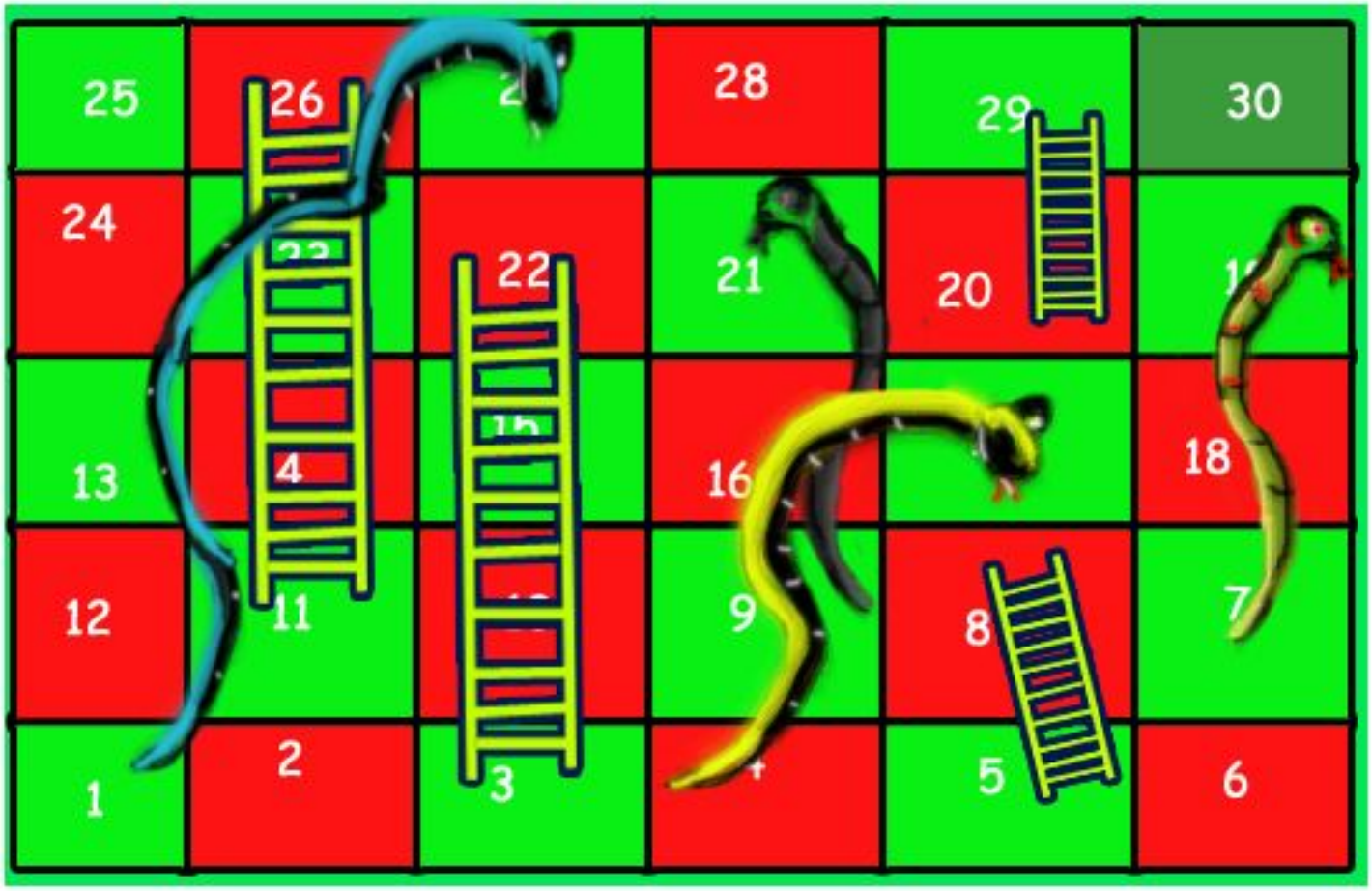
Shortest Path in Graph

Sample Questions



Shortest Path in Graph

Sample Questions



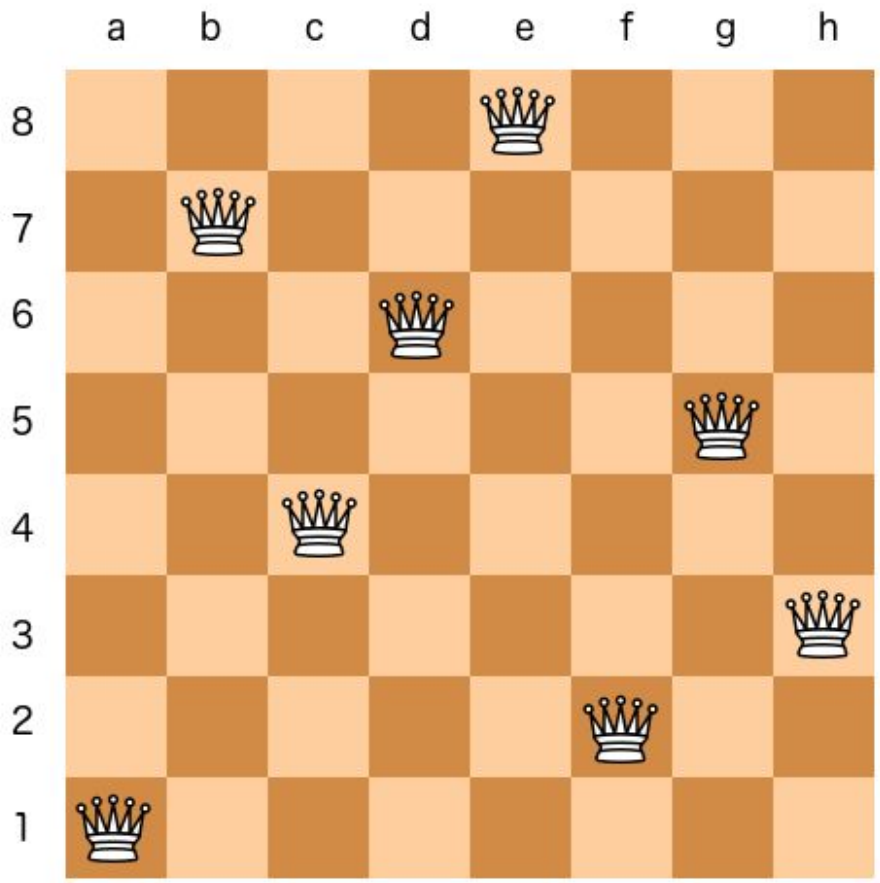
Shortest Path in Graph

Sample Questions

5	3			7				
6			1	9	5			
	9	8					6	
8				6				3
4			8		3			1
7				2				6
	6					2	8	
			4	1	9			5
				8			7	9

BackTracking problem

Sample Questions



BackTracking problem

Future Lectures

1. How Non-CS guys can get CS job ?
2. off-campus opportunities for Software jobs.

FAQ

1. This course is graded but it won't be added to your CGPA.
2. How much basic knowledge one should need ? - If your basics aren't clear then this course may become heavy/hectic.

Homework

1. Sign up on all online judges/coding platforms
2. Github repo