ACM ACPC Club Assiut University
Level 1 Training Plan (Juniors)

Training Content:

- ## Solving Techniques.
  - Complexity analysis , adhocs
  - Frequency Array
  - Prefix Sum
  - Scanf , printf , struct , vector
  - #include< String> , <algorithm>
  - binary search
  - two pointers
  - Greedy
  - Advanced Recursion
  - Brute Force and Introduction to Dynamic Programming.
  - backtracking
- ## Data Structures
  - Linear Data Structures (stack , queue , deque , priority_queue)
  - Non-Linear Data Structures (set , multiset , map , unorderd_map)
  - Sorting , compare function
  - bit masking , bitset
- ## Math
  - number theory (primes , sieve , factorization , divisors)
  - number theory (gcd , lcm , pow , mod , combination ncr ,npr)
- ## Graph
  - graph representation
  - Graph traversal bfs , dfs
  - Bipartite Graph Check
  - topological sort
  - flood fill . Connected Components
- ## Geometry
  - Points and Lines
  - Triangles, circles, regular polygons

Training System:

- **There will be a weekly session about** :
  - Explain one topic from the content.
  - Solve easy and medium problems about this topic.
- **There will be weekly practice session about :**
  - Every Mentor will be with 5 trainees assigned to him.
  - Will reversion to them the content that explained in session.
  - Solve with them some problems in sheet and contest.

- **There will be a weekly sheet.**
- **There will be a weekly online contest.**
- **Sheets and Contests Style**.
  - Sheets and Contests will be in www.codeforces.com
  - Most of Contest Problems will be from Codeforces, Our previous Groups.
  - Contest Duration (5H).
  - Problems Categories will be (1 ace , 3 A, 4 B, 4 C).
  - For more details about contest Link

- **Rules** :
  - Each Trainee should solve 80% of sheet.
  - Each Trainee should join every contest.
  - Each Trainee should attend 80% of sessions to get certificate.

Resources:

- **Our Sheet that have all problems and videos and blogs** Level 1 sheet

Plan Timeline

Week	Dates	Category	Topics
week 1	24/2/2019	Solving Techniques	Complexity analysis , adhocs
			Frequency Array
			Prefix Sum
			Scanf , printf , struct , vector
week 2	3/3/2019	Data Structures	#include< String> , <algorithm>
			Linear Data Structures (stack , queue , deque , priority_queue)
			Non-Linear Data Structures (set , multiset , map , unorderd_map)
week 3	10/3/2019	Data Structures	Sorting , compare function
			bitmasking , bitset
week 4	17/3/2019	Solving Techniques	binary search
			two pointers
			greedy
week 5	24/3/2019	No Thing	Week Upsolve and Filteration After this Week
week 6	31/3/2019	math	number theory (primes , sieve , factorization , divisors)
			number theory (gcd , lcm , pow , mod , combination ncr ,npr)
week 7	7/4/2019	Solving Techniques	Advanced Recursion
			Brute Force and Introduction to DP
			backtracking
week 8	14/4/2019	Graph	graph representation , Graph traversal bfs , dfs
			Bipartite Graph Check , topological sort , flood fil , Connected Components
week 9	21/4/2019	Geometry	Points and Lines
			Triangles, circles, regular polygons.

Goals:

- Increase thinking skills.
- masters basic algorithms/data structures and has good knowledge in most of the topics
- Be fast in coding and increase the ability of writing simple solutions for problems.
- Building an organized way of thinking in attacking problems.
- Reach a Expert rank in codeforces and Can Solve 70% of problems A,B , C.

Notes:

- This training is totally free.
- Training Duration 9 Weeks.
- Session every Tuesday from 2 to 7 PM.
- Practice every Saturday from 10 to 5 .
- Number of trainee 60 from level 1 , 2 , 3 , other Colleges.
- Number of Mentors 15.
- Instructor this year is
  1) Ahmed Mohamed Hafez