Group Assignment- Algorithms

Presentations: On 3 Nov (G1 - G6), 7 Nov (G7-G11) 2017

- These are broad descriptions of the problem.

- First step for the team is to thresh out: How do you formulate the problem; its scope; assumptions; inputs required etc.

- Then formulate strategies for solving the problem. Identify classical algorithmic problem(s) that are similar.

- Presentation should include: a) Problem Formulation b) Strategies adopted c) Algorithm d) Tracing on a realistic example. Each team is given 15 minutes for presentation)

1. **Team formation :** Forming teams for a hackathon or to maximize learning in a class or ...

2. **Route planning** in order to reach office faster (inputs: day of the week/ traffic at a specific time/ bad roads/ weather /neighbourhood school timings/...)

3. **Uber/Ola :** Route planning /pricing in ola/ ola share etc.

4. **Your favourite Puzzle / computer game :** How a particular Computer game has been designed...

5. **Planning a menu in the mess :** To come up with strategies so that cost should not exceed certain 'C' amount but increase happiness of majority (constraints: cost and likeability)

6. **Train booking:** If one is taking a long journey covering many places how do you plan the journey (constraints: to finish within n days and cost not to exceed C amount)

7. **Locating District headquarters:** How do you decide: where and optimal number (number of villages covered/accessibility/...)

8. **Conducting Entrance exam planning:** Minimize number of centres and cost but maximize coverage (for eg:A college may have a capacity for a a large number of students, but may have small rooms that may need many invigilators...)

9. **Book/Movie recommendation** Algorithms: How they may be working?

10. **Route Planning**: When you go to a supermarket (you are familiar with) along with a list of items to buy and you are in a great hurry, how do you plan so that you can accomplish your task fast?

11. **Auto-completion recommendations on google:** What approaches may be underlying this problem

12. **Architect Problem:** You are designing a house in an empty rectangular plot of dimensions mXn given requirements of the number of rooms etc. Plan an algorithmic approach to the design so that you can get different feasible plans that satisfy the requirements.

13. **Crowd sourcing Translation Problem** Suppose a large text has to be translated and the crowd is asked to volunteer: pick up any piece they like and translate. The crowd consists of experts/ novices (expert rating is given). How do you put a translation of reasonable quality together from the many overlapping pieces.