

Statement 1

How can we present some or all of data, stored as a network of interconnected objects. The visualization should not only 'correctly' represent the connections between the objects stored but also in a way that lets the user intuitively understand & navigate through the data.

Why is it required ?

We are now living in times where information is everywhere, often in abundance. But the methods to "make sense" out of the information are still lagging behind. This has only widened the gap between "data" and "information" . This state of chaos is all the more evident in areas like social networks.

The Challenge:

Can you come up with new ways to visually represent data, which makes comprehending the meaning hidden in the data - easier, faster & more accurate?

For example, Joe here would greatly benefit from an application which could help him obtain a more visual representation of the vast data that he has, and thus help him extract some meaningful information out of it. Joe, you see, is terribly confused as of now:

The following data is available about all twitter users:

1. Username
2. Location/pin-code
3. Active areas of interest
4. Active areas of expertise
5. Contact Info

Now Joe lives in Delhi. Joe is all excited about this brand new idea he's got. All he needs now: the right people to take it forward with him.

He knows a lot of people on twitter & they know a lot of people. The information available to Joe available the same as mentioned above .

Design a visualization method, which easily allows Joe to:

1. Frame his needs in terms of interest, expertise, location
2. Visualize all twitter followers w.r.t. his need/project
3. Contact/group/act in an effective manner with least effort. (Yeah, Joe is lazy!)

Now Let's Get Started:

Provided below is what a very fundamental solution would be, something which is not very convenient and almost of no use to Joe :

1. Show Joe a form with 3 fields: interest, expertise, location.
He can enter his keywords for each & then save it to create his "requirement profile".
2. The top of the list are the geographically closest folks in the list, he is shown those people who match all the keywords entered by Joe. He can send them a message by clicking a "send message" link besides their profile.

Help Desk :

The following links would of course just provide the contestant with a very good idea to what the solution of the problem might be. They will provide the contestant with an insight into the concept efficient visual representation of inter-related data. Idea Challenge expects the contestants to come up with something way more innovative and efficient.

1. www.wefeelfine.org
2. www.musicoverly.com
3. <http://www.number27.org/work.html>
4. <http://www.visuwords.com/>

Also it may be useful to go through the wiki entry on **Hierarchical Temporal Memory (HTM)** . This particular concept might give the participants a deep insight into the current scenario and of the merits/demerits of this implementation.

Statement 2

Advertising on Billboards is, by far, one of the best ways of capturing the minds of the people with a new product. However deciding for strategic locations to put up these billboards is something which has always troubled corporations.

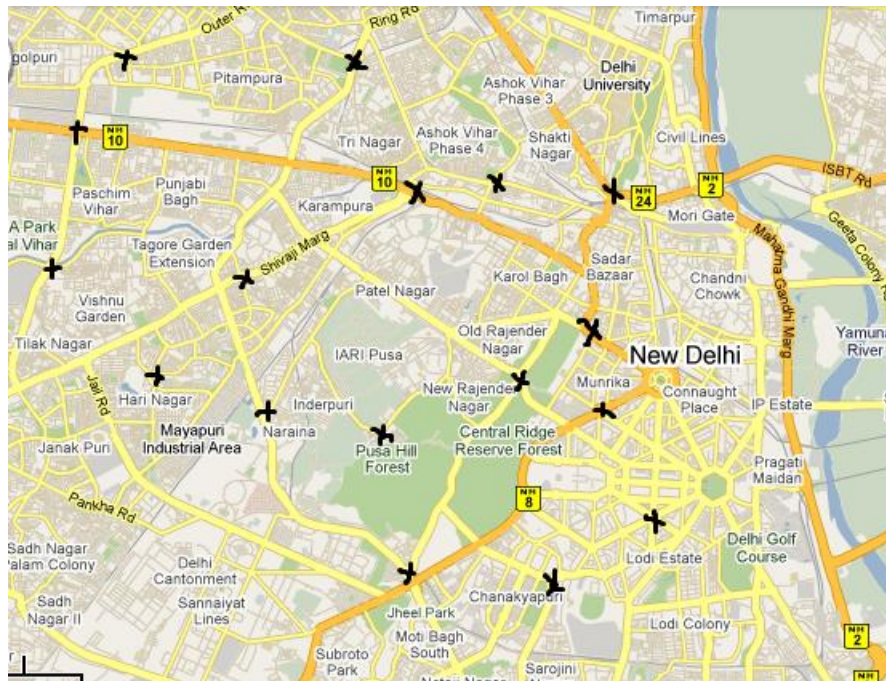
Now Joe (oh yes! It's him) has just launched his new product and is super-excited about publicizing it. What better way than: Billboards!

However there is a slight hitch, he has the maps of the areas he wants to publicize in, he's got permissions from the authorities to put up his hoardings, yet he cannot make up his mind as to which sites to choose!!!

The Challenge:

Given a particular region and the fixed number of spots that can be used to put up billboards in that region, the contestants are required to come up with the best possible solution to:

- The number of billboards to be used
- The spots that have to be chosen for the billboards to be put up.



[Map for *illustrative purposes only*]

X marks the spots where Joe is permitted to put up the hoardings]

Now Let's Get Started

As a primitive approach one could visualize the spots where Joe has been permitted to put up the billboards as vertices of a graph. However one must keep in mind that using all the permitted locations would not be optimal. For example placing two hoardings along a particular route would increase the cost (and Joe is short of cash, it's a startup!!!) and would not provide greater publicity. And yet the algorithm for the selection of spots should be such that they cover the maximum area/population.

Help Desk:

The contestants might find it useful to brush up on concepts of Graph Algorithms. The following books may come in handy.

1. Graph Theory With Applications to Engg. & Comp. Sc. by Narsingh Deo.
2. Graphs and Networks by **Zemanian**, Armen H.
3. Applications of Algebraic Topology: Graphs and Networks : by Solomon Lefschetz

Note: The contestants will be required to come up with a solution which is innovative and at the same time is practical/profitable to apply in the industry. Also the participants are to clearly mention the assumptions involved (if any) in their algorithms and implementations.