Personal Information

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- (e-mail, IM, home address, web page URL, phone number)
- Location (time zone) : Mangalore, Karnataka, India
- University / Department : Computer Science Engineering Department at NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA
- Brief background info:
    - About myself: I am from India, i don't classify myself on basis of any state nor any region besides my country.
    - My favourite area of interest are mathematics and algorithms that is the reason I have chose computer science stream.
    - In my free time I would like to study books by Cormen(Introduction to Algorithms) and Jon Kleinberg(Algorithm Design , Networks, Crowds, and Markets).Also, I take part in various Online programming contests and practice sessions.
    - This is my first time at GSoc, Hopefully, I am looking forward to make some really good friends during GSoc 2013.
    - I am very good in C,C++ ,Java and well versed in Algorithms and their implementation.
    - I have studied the reference papers regarding the topic and found it very interesting and I am pretty sure and confident that I can implement it as per requirement of the Project.
    - GPA: I Class.
- Technical Background
    - Skills: C, C++, Java, 80x86 Assembly programming, Shell, Latex, MPI, SQL, SOLR, Hadoop.
    - AISSCE: 90.20 %
    - AISSE: 94.40 %
    - AIEEE: 4143 [AIR]
    - GPA: Class I
    - Interests: Game Theory, Social Network, Algorithms Design.
    - Operating System: Ubuntu 12.04 LTS(usually), Windows 8(when I feel like gaming)
    - Presently I am not involved in any other free software projects.
    - Mathematics hs been my favourite subject all along specially algebra. I have solved many puzzles and problems on number theory.
    - I have taken courses on discrete mathematics and Concrete mathematics and have secured 8/10.

Project Information

- Project Title :Implement Inserter Concept for DUNE's (Sparse) Matrices
- Brief description in your own words :
- Introduction of Inserter object to stand-alone matrix operations allows further modification in sparse matrix even after insertion phase. Thus it overcomes the dis-advantage of Insert at fly idea and two phase matrix utilisation method.
  The only concern in this approach is to choose the slot size s carefully depending upon the application we are dealing with.
- Detailed description. if you are proposing the project:
- The whole proposal will use CRS (Compressed Row Storage) for all manipulations and operations. During testing phase the default slot size will be 5 for each row. The data structure used will be linked list in order to generalize all types of matrix form. After each insertion phase destructor will be called, it will perform the compression of the matrix .The whole task is divided in 3 phases:
- **First phase:** The total size of each row is computed from the slot size and the entries in spare container. The arrays for the column indices and for the values are resized at this point if necessary.
- **Second phase:** Move the entries in the slots to their final location in an appropriate combination of forward and backward copy operations.
- **Final phase: T**he values in the spare container are inserted in the rows and unused elements at the end of the column index and value arrays are cut off.

- Development schedule including milestones
- As per mentor I can mend my schedule but review of progress once a week is preferred.
- Stage 1: Analysis of problem statement.
- Stage 2: Proposal of solution to mentor for any verification and validation before development.
- Stage 3: Coding for the problem begins with regular invigilation of mentor.
- Stage 4: Final source code review and then proceed to documentation.
- Stage 5: Submission of final project with all relevant resources needed.

- How much time will you contribute per week
- I will contribute 4-5 hours per day.

- What time zone will you be working from
- GMT+ 0530 hrs.

- What software/libraries will you use :
- For implementing Inserter object I would like to use MTL4 (Matrix template library 4) since it provides generic library support for dense and compressed sparse matrices.

Misc

- **Why did you choose DUNE?**
- This is my first time at GSoc so, want to work for organization with whom I can match up my interest so I can put my best efforts into project I am doing. After getting through the project idea of DUNE's project I can surely assert that DUNE is that organization.

- **Why are qualified for the project?**
- Used sparse matrices in many problems such as matrix multiplication.
- Very good in algorithms and data structures.
- Strong foundation in C,C++.
- I just Love mathematics.

- **Previous relevant experience:**
- I have secured rank#24 at hackerrank in CodeSlam in Oct 2012.
- Taken part in NetApp programming contest and successfully submitted code for 1 problem out of two.
- I takes part in various online programming contest and practice sessions. My profile: www.hackerrank.org/crish_07int

- **Links to previous work samples that might underline your argument.**
- As such I don't have links on cloud but I have produced the code for NP problem (TRAVELLING SALESMAN PROBLEM) that is very near to optimal solution.
- I have implemented the problem of Integer Multiplication by reducing its complexity from O(n^2) to O(n^1.59).

- **Other commitments during summer of code (vacation, exams, etc.)**

  I haven't applied to any other internship or project, So I am not working on any other project than this. I am doing this project full-time during summer.