APS Project Progress Report

Title:

Implement van Emde Boas tree with application to Prims Minimum Spanning Tree algorithm and compare the same with AVL and Red Black tree implementations of Prims algorithm.

Team Members:

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Deliverables:

- Implementation of Prims using van Emde Boas in C++
- Implementation of Prims using AVL tree in C++
- Implementation of Prims using Red Black tree in C++
- A final project report describing the findings of the comparision of prims algorithms using van Emde Boas , AVL, Red Black trees with respect to Time Complexity , Space Complexity , type of graphs(dense graph , sparse graph, multi graph ,star graph , wheel graph). The report will include graphical comparisions of the above mentioned algorithms for Prims implementation ,and also how they behave with respect to scalability.

Delivery Plan:

24 Oct	Preliminary discussions regarding the requirements with TA
TBD	Discussion of algorithm to be implemented
5 Nov	Implementation Evaluation
TBD	Implementation of suggested enhancements
TBD	Preliminary discussion on project report
10 Nov	Final Submission

Technologies to be used:

C++14

Resources :

- Introduction to Algorithms By CLRS
- http://web.stanford.edu/class/archive/cs/cs166/cs166.1166/lectures/14/Slides14.pdf
- http://fileadmin.cs.lth.se/cs/Personal/Rolf_Karlsson/lect12.pdf
- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-design-and-analysis-of-algorithms-spring-2012/lecture-notes/MIT6_046JS12_lec15.pdf
- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-introduction-to-algorithms-sma-5503-fall-2005/video-lectures/lecture-10-red-black-trees-rotations-insertions-deletions/

- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-introduction-to-algorithms-sma-5503-fall-2005/video-lectures/lecture-10-red-black-trees-rotations-insertions-deletions/lec10.pdf
- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos/lecture-6-avl-trees-avl-sort/

Github Repository :

https://github.com/chittaranjan-rath/Prim-Implementation

Testing Plan:

Input file: Contains the graph on which Prim is to implemented.

Output file: Contains the actual output for the respective input file .It is used for validation.

End User Documentation:

The comparision report will be formulated after executing the algorithms with respect to Prim for various input types and the generated graphical data will report to the user about the comparative performance of each algorithm.