CS 430 project plan

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Topic Category

Algorithms, implementation and asymptotic behavior for finding spanning trees.

Content Description

We are going to choose “finding spanning trees” as our project, there are two algorithms for this project. One is Kruskal algorithm, the other is Prim algorithm.

Requirement

We are going to use Java, python or C++ to implement this problem.

In Kruskal algorithm, we decide to use array list to keep the smallest edges and sort this array by each node’s weight so that each time I can get the smallest edge from this queue. Then I decide to use union set method and DFS method to detect cycle in graph.

In Prim algorithm, we use two-dimensional array and array to store edge number and use a loop to find the smallest edge. Apart from that, we also use priority queue to store edge and it is easier to detect smallest edge.

After implemented this algorithm, we will count the time for running these programs with different size of input. Thus we can compare the difference in time complexity between two algorithms and difference between using union set method and DFS method to detect cycle in Kruskal algorithm and difference between using array and priority queue to store edges in Prim algorithm.

We will also consider the input size of 100K – 1M vertices and difference tree structures such as star, complete graph , tree and line etc.