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256285

Readme.pdf

Homework assignment 3.

Most of the assignment was related to graph theory, so I used familiar to me structures like Priority queue, Multiset, Map. There is better way to implement the solution. For example, one could use pointer to the structure instead of using strings and additional containers. I realized it too late to change whole code and submit it before deadline.

Function name	**Complexity**	**Description**
add_friendship	2 * (O(1+logM))	Find in unordered map and Insert in map. 2 times because of mutual friendship
remove_friendship	2 * (O(1 + 1))	Find in unordered map and Erase by pointer in map. 2 times because of mutual friendship
get_friends	O(1 + 1*M)	Find in unordered map and Push back in vector all items from map (linear)
all_friendships	O(1*N + M*logM)	Linear Push back from multiset into vector and sort in alphabetical order
shortest_friendpath	O(N + M*logM)	Dijkstra Algorithm with edge weight = 1
check_boss_hierarchy	O(N + M)	Cycles check for all nodes and Hierarchy check for all. Approx linear operations
cheapest_friendpath	O(N + M*logM)	Dijkstra Algorithm O(E+ V log V) with priority queue for better performance
leave_cheapest_friendforest	O (N*logM + N^2)	Krushkal's Algorithm to find MST (Minimum Spanning Tree) and removal of the omitted edges.

I hope you will understand my crappy code. Asking for mercy and considering Vappu and Exams during deadline week while grading. Thank you!