

Data Structure

I use a vector to store the edge of undirected graph. Also I use disjoint set to implement the Kruskal's algorithm to find the maximum spanning tree of undirected graph.

There are three classes DisjointSet, U_Graph and CycleBreaker which implement the function of disjoint set, undirected graph and the cycle breaker respectively. Also two struct Edge and Set which can be used in class U_Graph and DisjointSet.

Findings

1. Prim's is more efficient but Kruskal's is more convenient while implement. At first, I use Prim's algorithm instead of Kruskal's, because I think Prim's is more efficient. However, because Prim's focus on edges that connected to each chosen vertex, using adjacency list will be better. But using adjacency list to store undirected list will lead to redundant edges thus making wrong removed weight. So I change to Kruskal's and it is much more convenient.
2. When encountering a data type bug, it can be solved easily by using declaration auto. In this assignment, there are many types of declaration like int, unsigned int, pointer and so on. When need to compare two types of data, for example, to compare a int and an unsigned int in for loop, we can just declare I as auto to ignore what exactly the data type is.
3. Also, I have a deeper understanding on the makefile file. Like PA2, we can write the write file in the cyclebreaker.cpp, so the makefile can be clean.