Kruskal’s Algorithm

Input: A weighted undirected graph $G = (V, E)$ with weight function $f : E \rightarrow \mathbb{R}^+$

Output: A minimal spanning tree $T$ for $G$.

Method:

\[ T = \emptyset \ ; \]
\[ S = \emptyset \ ; \]
Construct a priority queue $Q$ of all edges in $E$ ;

for each vertex $v \in V$ do add $\{v\}$ to $S$.

while $|S| > 1$ do
    choose edge $(v, w)$ from $Q$ of lowest cost ;
    delete $(v, w)$ from $Q$ ;
    if $(v$ and $w$ are in different sets $W_1$ and $W_2$ in $S$ ) then
        Replace $W_1$ and $W_2$ in $S$ by $W_1 \cup W_2$ ;
        Add $(v, w)$ to $T$ ;
    end if
end while