The Undirected Steiner Tree Problem (USTP) involves an undirected graph $G = (V, E)$ with edge weights $c_{ij} \geq 0$ and a set of terminals $R \subseteq V$. A subset of edges $T$ is Steiner if it spans the terminals, it is a Steiner tree if it is minimally Steiner, its weight is $c(T) = \sum_{ij \in T} c_{ij}$. The UTSP is to find a Steiner tree of minimum weight, if it exists. For non-negative edge weights, this is equivalent to finding a Steiner edge set of minimum weight.

Exercise 1. (Tutorial session)
Solve the Undirected Steiner Tree Problem depicted in Figure 1 separating cut and Steiner partition inequalities.

Exercise 2. (Tutorial session)
Use porta to compute a complete description of the USTP polytope associated with the problem in Figure 1.

Exercise 3. (Tutorial session)
Solve the Undirected Steiner Tree Problem depicted in Figure 2 separating cut and Steiner partition inequalities.

Exercise 4. (Tutorial session)
Use porta to compute a complete description of the USTP polytope associated with the problem in Figure 2.
Figure 3: Draw LP solutions and cuts here.
Figure 4: Draw LP solutions and cuts here.