7th Assignment

1. The exercise asks to use the primal-dual method to construct *constant factor* approximate solutions for some network design problems (though, not all of them are NP-hard). In all the problems we assume to have in input an undirected connected graph with edge costs.

- Edge covering: the problem is that of selecting a minimum cost set of edges such that each vertex is adjacent to at least one edge.

- T-join problem: the problem is that of finding a minimum cost set of edges that has an odd degree at the vertices in T and an even degree at the vertices not in T, for a given even subset T of vertices.

- Lower capacitated tree partitioning: the problem is that of finding a minimum cost set of edges that partitions the vertices into trees such that each tree has at least k vertices for some parameter k.

- Lower capacitated path partitioning on *metric* graph: the problem is that of finding a minimum cost set of edges that partitions the vertices into paths such that each path has at least k vertices for some parameter k.

- Lower capacitated cycle partitioning on *metric* graph: the problem is that of finding a minimum cost set of cycles that partitions the vertices into cycles such that each cycle has at least k vertices for some parameter k.