Ασκήσεις Φροντιστηρίου #10

Approximation Algorithms and Integer Programming

1. Design an approximation algorithm for this problem. (BIN PACKING: Given a finite set I of items, a positive size for each $i \in I$ and a positive integer B, find a partition of I into disjoint bins such that the sum of the sizes of the items in each bin is no more than B and the number of bins used is minimized.)

2. Design a 2-approximation algorithm for the STEINER TREE problem.
(STEINER TREE: Given an undirected graph $G = (V, E)$ with non-negative edge costs and whose vertices are partitioned into two sets, required and Steiner, find a minimum cost tree in G that contains all the required vertices and any subset of the Steiner vertices.)

3. Give the IPs for the **Facility Location** problem and for the **Minimum Spanning Tree** problem.