A DISTRIBUTED VERSION OF A DUAL ASCENT ALGORITHM FOR THE RLT3 QAP RELAXATION

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The application of the Reformulation Linearization Technique (RLT) to the Quadratic Assignment Problem (QAP) leads to a tight linear relaxation with huge dimensions that is hard to solve. Previous works found in the literature show that these relaxations combined with branch-and-bound algorithms belong to the state-of-the-art of exact methods for the QAP. For the level 3 RLT (RLT3), using this relaxation is prohibitive in conventional machines for instances with more than 22 locations due to memory limitations. This paper presents a distributed version of a dual ascent algorithm for the RLT3 QAP relaxation that approximately solves it for instances with up to 30 locations for the first time. When compared to other lower bounding methods found in the literature, our algorithm generates the best known lower bounds for 26 out of the 28 tested instances, reaching the optimal solution in 18 of them.