A ROUTING ALGORITHM FOR INSPECTION OF STADIUMS OF UEFA EURO 2016

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Abstract— This work presents an algorithm for optimal routing to calculate the minimum cost route in order to perform the inspection of stadiums of the UEFA Euro 2016 hosted in the main cities in France. For the fact that it fits in the inspection problem, the vehicle routing algorithm was implemented by utilizing the traveling salesman problem through the Branch & Bound paradigm. First of all, the paper presents the problem to be solved as well as studies conducted in order to find a solution for it. Distances between all the cities involved in the soccer event were obtained by using Google Maps. After that it was created a graph to facilitate the visualization of the problem and it was considered that Bordeaux was the city where the inspection company was located in. The algorithm was implemented in the C++ language assisted by the DEV-C++ integrated development environment. Consequently, the algorithm was tested by considering different graphs in order to be validated and then apply it to the inspection problem. As a result, the algorithm worked properly and returned the minimum cost route from Bordeaux to perform the inspection in all stadiums. Finally, it was possible to conclude that the algorithm returns the exact minimum cost route to be used for the inspection company to inspect the stadiums before the beginning and after the end of the Euro 2016. Therefore, the algorithm developed in this work is a useful contribution for the inspection of stadiums in the UEFA EURO 2016 championship.

Keywords— Stadium Inspection; Travelling Salesman Problem; Branch and Bound.