

**OPTIMIZING THE PLACEMENT OF FIRE DEPARTMENT IN
KULIM USING GREEDY HEURISTIC AND SIMPLEX METHOD**

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ABSTRACT

Fire protection services are an important part of a municipality's obligations. The placement of fire stations is an important component in providing fire protection coverage. The binary integer programming (BIP) issue is a rare form of integer programming problem in which the value of variable x_i is only 0 or 1. In this case, condition x_i is also known as a "Binary" or "0 - 1" variable. BIP is used to solve a wide range of problems, such as resource allocation, scheduling, and network design. The objective of this project is to determine the best location for the fire department that gives the maximum coverage of safety, to minimize the total number of fire department by using greedy heuristic algorithm and simplex method and compared both method that gives the best solution for optimization. The first method is greedy heuristic method. Greedy heuristics is a type of optimization algorithm that makes decisions based on locally optimal solutions. Greedy heuristics work by iteratively making decisions that are locally optimal and then updating the current state of the problem to account for the decision made. This iterative process continues until a final solution is reached, which is usually optimal or close to optimal. The next method is simplex method. The simplex method is a conceptual model approach for analysing linear programming problems with any number of variables. When there are more than two choice variables, the simplex approach is utilized. Both methods were used to find the optimal location for the fire department to be in the selected region. The solution for method will be compared to find the best solution.

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