DOKUZ EYLUL UNIVERSITY

ENGINEERING FACULTY

DEPARTMENT OF COMPUTER ENGINEERING

CME2204 ALGORITHM ANALYSIS

ASSIGNMENT - III

Greedy Programming

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Abstract

The purpose of this assignment is to analyze and evaluate a greedy approach for optimizing player and coach allocation in a sports team. The goal is to minimize the total cost while fulfilling player demands and promoting a specified number of players. The approach utilizes a combination of hiring coaches and keeping unrented players based on certain conditions. The effectiveness of the approach is assessed by calculating the total cost incurred over a given number of years and comparing it to alternative strategies. The results of the greedy approach demonstrate its potential for cost reduction, although further research is recommended to explore its performance across various scenarios and datasets.

Introduction In the field of sports team management, optimizing player and coach allocation is crucial to ensure efficient resource utilization and minimize costs. The problem of player and coach optimization involves making decisions on hiring coaches, promoting players, and managing unrented players based on player demands and budget constraints. This report focuses on evaluating a specific approach, known as the "greedy approach," which aims to address this problem by employing a simplified and intuitive strategy.

Methodology

The greedy approach algorithm implemented in the provided code consists of the following steps:

1. Read player demands and salaries from input files.
2. Iterate over each year to process player demands.
3. For each year:
    - Check if the player demand is equal to or greater than the required number of players to promote.
    - If true, calculate the number of coaches to hire based on the excess demand, add the cost to the total cost, and reset the number of rented players.
    - If false, check if the demand for the next year is greater than the required number of players to promote and the current year is not the last year.
    - If true, calculate the cost of keeping unrented players and the number of coaches to hire based on the current demand.
    - Compare the cost of hiring coaches with the cost of keeping unrented players.
    - If hiring coaches is cheaper, update the number of rented players and add the cost of keeping unrented players to the total cost.
4. Return the total cost.

REFERENCES

GeeksforGeeks: Greedy Algorithms (www.geeksforgeeks.org/greedy-algorithms/)

Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). "Introduction to Algorithms."