**Sunburst chart

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Description automatically generated with low confidence**COMPUTER ENGINEERING DEPARTMENT**

Tinaztepe Campus, Buca-Kaynaklar, Dokuz Eylul University, IZMIR, TURKEY

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Final Report: Greedy Approach

Prepared by: Güney Söğüt

**1. Introduction**: The purpose of this report is to give information about *completed “Greedy Approach – Football Club Budget Problem”* assignment.

**2. Assignment Description:** The aim of the assignment is to create a greedy approach algorithm that calculates the minimum budget for the given years with respect to the given values which are n: year, p: max player to be promoted, c: coach cost.

**3.What is the Greedy Approach?**

A greedy algorithm is an approach for solving a problem by selecting the best option available in the current situation. It doesn't care whether the current best result will bring the optimal result.

**4. Completed and Incompleted Parts:** All of the requirements in the assignment documentation are completed.

**5. Greedy vs Dynamic:**

In the Greedy Approach, it is not guaranteed that the costs of each year are the optimal cases. However, in Dynamic Programming it is more and more accurate for the optimal solution. In the Greedy Approach, the algorithm finds the best case for the current year, the past and the future are not important. However, in Dynamic Programming, the algorithm stores the scenarios from the past and makes the newer steps according to them. Thus, Dynamic Programming for this assignment is much better.

**6. Greedy Approach:**

I’ve added 2 different approaches to the code. The more accurate one is Greedy(), and the less accurate one is Greedy2().

The Greedy1 function calculates the minimum cost for the current year by checking the next year’s demand. For example, let the number of the max players to be promoted free be 3, and the next year’s demand is 5. In this scenario basically, we need 2 players in order to satisfy the demand, thus, in the current year, the program calculates each situation for the next year to satisfy the demand and then tries to find the minimum cost for these conditions.

The Greedy2 function just basically calculates the minimum cost for the current year. The players to be kept actually are not important for it.

**6. Time and Space Complexities:**

The time complexity of the algorithm is O(n2) because we have 2 nested loops. It was O(n3) in the Dynamic Programming solution.

The space complexity of the algorithm is O(1). The space complexities are the same for both algorithms.

**References:**

<https://www.programiz.com/dsa/greedy-algorithm#:~:text=A%20greedy%20algorithm%20is%20an,in%20a%20top%2Ddown%20approach>.

<https://en.wikipedia.org/wiki/Greedy_algorithm>

<https://www.geeksforgeeks.org/greedy-algorithms/>

Class notes and lab documents

**Güney Söğüt**

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