# Project Proposal

*Dynamic Programming*

*Analysis of Algorithms*

*Sir Murtaza Pasha*

# DYNAMIC PROGRAMMING

## 1. Introduction

Dynamic programming is a problem-solving technique used to solve complex problems by breaking them down into overlapping subproblems and solving them in a bottom-up or top-down manner. It is applicable to problems that exhibit the property of overlapping subproblems and optimal substructure.

## 2. Objectives

- Understand the basic concepts of dynamic programming and its relevance in solving optimization problems.
- Study and analyze different dynamic programming approaches, such as memoization and tabulation.
- Implement dynamic programming algorithms for solving optimization problems, focusing on both recursive and iterative approaches.
- Evaluate the time and space complexity of dynamic programming algorithms and analyze their performance compared to other approaches.

## 3. Methodology

- Conduct an extensive literature review to gain a comprehensive understanding of dynamic programming.
- Develop a framework for analyzing and comparing the efficiency and effectiveness of dynamic programming techniques against other algorithmic approaches.
- Apply the implemented algorithms to a variety of problem instances and collect empirical data on their performance.
- Use visualizations and graphical representations to illustrate the dynamic programming process and the improvement achieved through memoization and tabulation.

## 4. Expected Outcomes

- Implementation of dynamic programming algorithms for solving various optimization problems.
- Evaluation and comparison of the performance of dynamic programming algorithms with other approaches.
- A well-documented project report highlighting the findings and analysis.

## 5. Conclusion

This project proposal aims to explore dynamic programming techniques for optimization problems, with a focus on understanding the concepts, implementing algorithms, and evaluating their performance. By gaining insights into the strengths and limitations of dynamic programming, the project outcomes will contribute to a better understanding of dynamic programming and its role in solving optimization problems efficiently.