

Machine Problem 2

Brute Force Algorithms: Review and Implementation

Brute force is an algorithmic strategy that shows a straightforward approach in solving a problem. The brute force approach is often the simplest to understand and implement. This approach serves as the foundation for understanding complex algorithms in greater detail.

Understanding Brute Force algorithms, you will let you understand and gain insights with the worst-case scenarios of these algorithms. You will also understand the importance of having an optimized solution to your problems.

OBJECTIVE: In this Machine Problem, you were asked to do a review and implementation for Brute Force algorithms. This will allow you to apply the theoretical Computer Science concepts through designing and analyzing these algorithms. This will provide experiences to demonstrate and implement your understanding and skills for real-world applications of Computer Science.

1. Students should analyze and review these algorithms accordingly.
2. The students will be asked to provide possible improvements with these algorithms and then implement them.
3. The students should provide a learning outcome and insight while working on this machine problem.

GUIDELINES:

1. Create a document report containing the following sections:
 - (a) I. Introduction *Describe Brute Force strategy and the content of your document report*
 - (b) II. Brute Force Algorithms *Discuss each Brute Force algorithm that we discussed in our Synchronous Session (Selection Sort, Bubble Sort, Sequential Search, Traveling Salesman Problem, and Knapsack Problem). Provide a pseudocode, simulation, and discussion for each algorithms.*
 - (c) III. Analysis of Time Complexity *Provide a detailed analysis of the time complexity of each brute force algorithm stated above. Please show and explain why do you get that time complexity.*

- (d) IV. Algorithms Comparison *Compare these algorithms in a tabular form and showing the Strengths, Weaknesses, and 5 Real World Application*
 - (e) V. Optimization Techniques *Investigate the optimization techniques that can be applied to these brute force algorithms.*
 - (f) VI. Findings and Conclusion *Create a comprehensive conclusion for your implementation and review. Discuss the importance of understanding brute force algorithms, findings, and learning outcomes.*
 - (g) VII: References
2. Implement all your Optimization Techniques in the document report by coding it using **any Programming Language**. The implementation should show the difference between the actual algorithm implementation versus the optimized implementation. Create a separate code for each algorithm and upload it in a repository (Github, Bitbucket, and etc).

DELIVERABLES:

1. You need to submit the Document Report containing the sections listed above. The Document Report should be done in LaTeX and export it into PDF format (both .latex and .pdf files should be submitted).
2. You also need to submit the source of code of your implementation technique located in a repository for better checking of the structure.
3. You are required to record the demo of the implementation explaining the optimization you did for these algorithms.

NOTES:

1. You are allowed to use any programming language only to implement this Machine Problem.
2. In google classroom submission bin, you just need to submit all the requirements above. You can submit a google link containing all the files related with your Machine Problem.
3. Be unique and creative.
4. Submit the folder with filename: COURSEYEARANDSECTION-GROUP-MP2

REMINDERS:

1. This should be done by group.
2. AI Generated work or copied from the internet will be considered as DISHONESTY and CHEATING and should be a sanction for FAILING GRADE with this activity.

3. Similar work with your **classmate or even with other block** should be a sanction as well for FAILING GRADE with this activity.
4. Late submission will not be accepted. Submit your machine problem on the said deadline.

GOOD LUCK AND WORK ON YOUR MACHINE PROBLEM!