

Shiv Nadar Institute of Excellence

CSD102_DS_Graded Lab Exam #2

Instructions: -

Max Marks: -10

1. Programming language must be C/C++.
 2. Each group must choose one problem to solve.
 3. The group size should be between 3-4 members.
 4. Only one submission of the code file is allowed per group.
 5. Supplementary material should be submitted in PDF format only.
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1. Build a program that needs to find the maximum gap between any two numbers in a large dataset.

Describe a system that:

1. Stores the entire dataset in a way that makes it easy to find the maximum gap.
 2. Allows for efficient insertion and deletion of elements.
 3. Uses an algorithm that takes advantage of the structure of the data to find the maximum gap quickly.
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2. Build a login system for a web application and ensure that user passwords are stored securely.

Describe a system that:

1. Stores user passwords in a way that makes it difficult for an attacker who gains access to the database to determine users' actual passwords.
 2. Allows users to log in by verifying their password without storing the password in plain text.
 3. Provides an additional layer of security to prevent brute-force attack
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3. Build a program that needs to efficiently search a large dataset of records for a specific value.

Describe a system that:

1. Stores the records in a way that allows for efficient searching for a specific value.
2. Allows for efficient insertion and deletion of records.
3. Uses an algorithm that takes advantage of the structure of the data to search for the value quickly.