INFORMATICS ENGINEERING STUDY PROGRAM
SCHOOL OF ELECTRICAL ENGINEERING DAN INFORMATICS
BANDUNG INSTITUTE OF TECHNOLOGY

Checkpoint #2

Database Management System Development

Reported By:
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huh?++

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IF3140 - Database Systems

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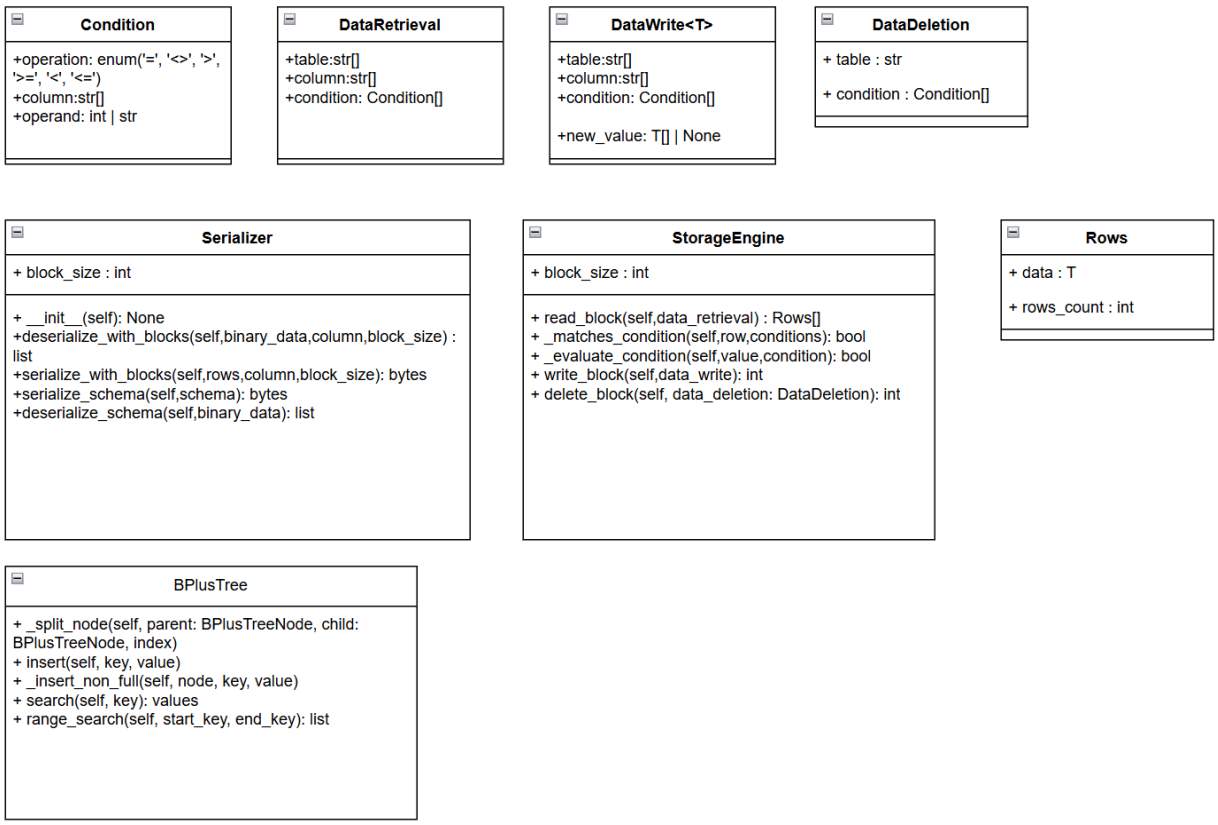
Part I. Component Overview

Explain your component design overview. Please provide your class diagram!



1. StorageEngine Class

   The StorageEngine class implements the core functionalities of a storage manager, including methods such as read_block, _matches_condition, _evaluate_condition, and write_block. These methods are essential for data storage, retrieval, and manipulation within the database system.

2. Serializer Class

   The Serializer class provides functionality for serializing and deserializing data. Serialization is the process of converting data from an object format into a binary format for efficient storage or transmission. Conversely, deserialization converts binary data back into its original object format for processing.

3. Condition Class

   The condition class represents conditions or constraints that must be satisfied by the data in the database. For example, conditions like age > 20 are stored and evaluated using this class.
4. DataRetrieval Class

   The DataRetrieval class encapsulates queries, enabling efficient retrieval of data from the database. This abstraction facilitates interaction between the query processor and the storage manager.
5. DataWrite Class

   The DataWrite class encapsulates data intended for updates in the database. It serves as an intermediary object that specifies the data to be modified and the corresponding criteria.
6. DataDeletion Class

   The DataDeletion class encapsulates information about data that is to be removed from the database. It provides a structured way to handle deletion operations within the storage manager.
7. Rows Class

   The Rows class is responsible for storing data that is to be processed or returned to the query processor. This class organizes data in a format suitable for further processing by other components of the system.
8. BPlusTree Class

   The BPlusTree class implements the functionality of a B+ Tree indexing structure. It is designed to enhance database performance by efficiently organizing and retrieving data through hierarchical indexing. Key methods include insert, search, delete, and range queries, ensuring optimal data access speeds.

Part II. Finished Part

Explain part of the component that have already been developed

1. Serialization :
   Implements the conversion of rows into a binary format for efficient storage.
2. Write_blocks :
   Facilitates updating existing values in the database through structured write operations.
3. Read_blocks :
   Retrieves rows of data from the database based on specified criteria.
4. Schema Serialization :
   Converts the schema of tables into a serialized format for storage and retrieval.
5. Delete_block :
   Deletes rows of data from the database based on specified conditions
6. Indexing :
   Speeds up data retrieval by creating a structured reference on specific table columns.

Part III. To Do

Remaining tasks to be completed

1. Unit Testing for Indexing and Deletion
   Unit tests validate the correctness and efficiency of indexing and deletion functionalities. These tests ensure accurate query results, proper metadata updates, and database integrity.
2. Implement Statistics Method
   The get_stats method calculates database metrics like row count, tuple size, blocking factor, and block count, aiding query optimization and system performance monitoring.

3. Integrating the Components

   Integration ensures seamless interaction between the storage manager and other mDBMS components. It aligns interfaces and enables end-to-end functionality, including query processing and storage.

Part IV. Workload Distribution

Student ID	Name	Workload
13522126	Rizqika Mulia Pratama	read_blocks, unit testing, indexing
13522136	Muhammad Zaki	serialization, write_blocks
13522149	Muhammad Dzaki Arta	read_blocks
13522155	Axel Santadi Warih	write_blocks, schema serialization, delete_block