QUESTION:

In a task scheduling application, describe how a hash table can be used to store and quickly

retrieve scheduled tasks based on their unique identifiers or names. Discuss the advantages

of using a hash table for task management.

SOLUTION:

In a task scheduling application, a hash table can be used to store and quickly retrieve scheduled tasks based on their unique identifiers or names. Each task can be assigned a unique identifier or name, which can then be used as the key in the hash

table. The value associated with each key would be the details of the scheduled task, such as

the time, date, and any other relevant information.

When a user wants to retrieve a specific task, they can simply provide the unique identifier or

name, and the hash table will quickly locate the corresponding value, allowing the user to access

the details of the task.

The advantages of using a hash table for task management include:

1. Fast retrieval: Hash tables have constant time complexity for retrieval, meaning that the time

it takes to retrieve a task does not depend on the number of tasks in the table. This makes it

efficient for quickly accessing scheduled tasks.

2. Efficient storage: Hash tables use a key-value pair system, which allows for efficient storage

and retrieval of tasks based on their unique identifiers or names.

3. Easy updates: Hash tables allow for easy insertion, deletion, and updating of tasks, making it

simple to manage the task schedule.

4. Collision handling: Hash tables are designed to handle collisions, ensuring that tasks with

the same hash value can be stored and retrieved without issue.

Overall, using a hash table for task management provides a fast and efficient way to store and

retrieve scheduled tasks based on their unique identifiers or names. It simplifies the task

scheduling process and allows for quick access to task details.