**REPORT**

**COAL LAB & THEORY**

# **Weather Monitoring System**

GROUP MEMBERS

1. Ammad Khan (2212105).
2. Zain Dhanani (2212135).
3. Habibuallah Uqaili (2212109).

SECTION: BS/CS 3-A

SUBMITTED TO:

**Sir Ali Fatmi**

**&**

**Sir Wali Muhammad**

**ABSTRACT:**

The Weather Monitoring System is a Java-based application designed to record, store, and provide weather information. The system includes features for adding weather records, querying data by location and date, and displaying the latest updates. The code employs object-oriented principles and custom data structures to manage weather-related information.

**CODE:**

**MAIN COMPONENT:**

1. **Weather Record:**

* Represents a weather record with attributes: location, date, and temperature.
* Encapsulates data through private fields and provides getter methods.

1. **Hash Map :**

* Implements a custom hash map for efficient storage and retrieval of key-value pairs.
* Features methods for putting, getting, and computing values if absent.

1. **Admin Credentials:**

* Represents admin credentials with username and password.
* Follows encapsulation principles with private fields and getter methods.

1. **Editor:**

* Placeholder class for potential editor functionalities.
* Not utilized in the current code.

1. **Linked List:**

* Implements a custom linked list with push, pop, and is Empty methods.
* Used for storing the latest weather updates.

1. **Weather Monitoring System:**

* Main class orchestrating the entire system.
* Manages lists and maps for weather records, admin credentials, and latest updates.
* Provides methods for adding weather records, admin login, and user interactions.
* Implements console-based menus for both admins and users

**Key Features:**

1. **Data Storage:**

* Weather records are stored in lists and maps for efficient retrieval based on location, date, and the latest updates.

1. **Admin Login:**

* Admin credentials are verified, allowing access to features like adding weather records.

1. **User Interactions:**

* Users can query weather information by location and date, and view the latest updates.

1. **Console Formatting:**

* ANSI escape codes are used for text formatting, enhancing the console-based user interface.

**Main method:**

* Initializes the Weather Monitoring System.
* Adds sample weather records to demonstrate system functionality.
* Presents a console-based menu for admins and users to interact with the system.
* Displays a group members section at the end.

**Conclusion:**

The Weather Monitoring System code demonstrates a solid understanding of Java programming concepts, object-oriented design, and custom data structure implementation. It provides a foundation for further enhancements and improvements, making it a valuable starting point for a weather-related application.