

Project Report:

Mental Health Simulation using DSA

Submitted By:

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Course: B.Tech CSE

Platform: Cipher School

Submission Type: GitHub Repository

• Project Description:

The Mental Health Simulation is a C++ console-based project designed to help users track, manage, and analyze their mood levels over time. The system uses multiple Data Structures (DSA) such as Stack, Queue, Linked List, and Binary Search Tree (BST) to manage entries, undo actions, analyze mood patterns, and store session history.

This project simulates the core functions of a basic mental health journal, emphasizing emotional self-awareness and reflection, while demonstrating important DSA concepts in action.

• Objective:

To build a meaningful and functional simulation that:

- Helps users log daily moods
- Allows users to undo mistakes
- Tracks user history
- Analyzes patterns using efficient data structures

- **Data Structures Used:**

Feature / Module	Data Structure Used	Purpose
Undo Mood Entry	Stack	LIFO structure to undo the most recent mood entries
Mood Logging	Queue	FIFO structure to track mood entries in sequence
Mood Analysis	Binary Search Tree (BST)	To store and analyze mood levels in sorted order
Session History	Linked List	Stores the user's actions for a single session

- **Authentication:**

- Signup/Login system implemented using a simple username-password system
- Secures user mood logs within a session

- **Features Implemented:**

- User Signup and Login
- Enter Mood (1 to 10) with a note
- Undo Last Mood Entry
- View Mood History
- Analyze Mood using Binary Search Tree
- View complete session history
- Clear and interactive menu-driven UI

- **Sample Output (Console):**

----- Mental Health Simulation -----

1. Signup

2. Login

Choice: 1

Enter Username: pavan

Enter Password: ****

Signup Successful. Please login.

...

----- Menu -----

1. Enter Mood

2. Undo Last Entry

3. View Mood History

4. Analyze Mood (BST)

5. View Session History

6. Exit

...

- **Tools Used:**

- Programming Language: C++
- Platform: Google Colab / VS Code / CodeBlocks
- Version Control: GitHub

- **Folder Structure (GitHub):**

mental-health-dsa/

```
|
|— mental_health.cpp
|— README.md
|— Project_Report.pdf
```

- **Learning Outcomes:**

- Implemented 4 core data structures from DSA
- Learned practical application of stacks, queues, linked lists, and BSTs
- Built a real-world simulation console app
- Gained hands-on experience with version control and project documentation

- **Conclusion:**

This project provides a meaningful application of DSA concepts in simulating a basic mental wellness tracker. It combines logical structuring with real-world usability, demonstrating skills in problem-solving, DSA design, and C++ development.