INSTITUTE OF AERONAUTICAL ENGINEERING
(AUTONOMOUS)
Dundigal - 500 043, Hyderabad, Telangana

Complex Problem-Solving Self-Assessment Form

1	Name of the Student	M. BALA YOGENDER
2	Roll Number	25951A6630
3	Branch and Section	CSE-(AI&ML) - A
4	Program	B. Tech
5	Course Name	Front-End Web Development
6	Course Code	ACSE04
7	Please tick (✓) relevant Engineering Competency (ECs) Profiles	

EC	Profiles	(✓)
EC 1	Ensures that all aspects of an engineering activity are soundly based on fundamental principles - by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic requirements applicable to the engineering discipline	✓
EC 2	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models.	✓
EC 3	Support sustainable development solutions by ensuring functional requirements, minimize environmental impact and optimize resource utilization throughout the life cycle, while balancing performance and cost effectiveness.	
EC 4	Competently addresses complex engineering problems which involve uncertainty, ambiguity, imprecise information and wide-ranging or conflicting technical, engineering and other issues.	✓
EC 5	Conceptualises alternative engineering approaches and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.	✓

	EC 6	Identifies, quantifies, mitigates and manages technical, health, environmental, safety, economic and other contextual risks associated to seek achievable sustainable outcomes with engineering application in the designated engineering discipline.	
	EC 7	Involve the coordination of diverse resources (and for this purpose, resources include people, money, equipment, materials, information and technologies) in the timely delivery of outcomes	
	EC 8	Design and develop solution to complex engineering problem considering a very perspective and taking account of stakeholder views with widely varying needs.	✓
	EC 9	Meet all level, legal, regulatory, relevant standards and codes of practice, protect public health and safety in the course of all engineering activities.	
	EC 10	High level problems including many component parts or sub-problems, partitions problems, processes or systems into manageable elements for the purposes of analysis, modelling or design and then re-combines to form a whole, with the integrity and performance of the overall system as the top consideration.	✓
	EC 11	Undertake CPD activities to maintain and extend competences and enhance the ability to adapt to emerging technologies and the ever-changing nature of work.	✓
	EC 12	Recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge. Require judgement in decision making in the course of all complex engineering activities.	✓
8	Please tick (✓) relevant Course Outcomes (COs) Covered		
	CO	**Course Outcomes**	**(✓)**
	CO 1	Describe language basics like alphabet, strings, grammars, productions, derivations, and Chomsky hierarchy, construct DFA, NFA, and conversion of NFA to DFA, Moore and Mealy machines and interpret differences between them.	✓
	CO 2	Recognize regular expressions, formulate, and build equivalent finite automata for various languages.	✓
	CO 3	Identify closure, and decision properties of the languages and prove the membership.	✓
	CO4	Demonstrate context-free grammars, check the ambiguity of the grammar, and design equivalent PDA to accept the context-free languages.	
	CO 5	Uses mathematical tools and abstract machine models to solve complex problems.	✓
	CO 6	Analyze and distinguish between decidable and undecidable problems.	✓

9	Course ELRV Video Lectures Viewed	**Number of Videos**	**Viewing time in Hours**
		-	-
10	Justify your understanding of WK1	-	
11	Justify your understanding of WK2 – WK9	-	
12	How many WKs from WK2 to WK9 were implanted?	-	
	Mention them	-	

Date: 09-12-2025

Yogi

Signature of the Student

COMPLEX ENGINEERING PROBLEM

A COURSE SIDE PROJECT ON

Front-End Web Development

M. BALA YOGENDER

25951A6630

HYDRO TRACK

A Project Report submitted in partial fulfillment of the requirements for the award of the degree of

Bachelor of Technology
in

CSE (Artificial Intelligence & Machine Learning)

By

M. BALA YOGENDER

25951A6630

Department of CSE (Artificial Intelligence & Machine Learning)

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad – 500 043, Telangana

November, 2025

DECLARATION

I certify that

a. The work contained in this report is original and has been done by me under the guidance of my supervisor (s).

b. The work has not been submitted to any other Institute for any degree or diploma.

c. I have followed the guidelines provided by the Institute for preparing the report.

d. I have conformed to the norms and guidelines given in the Code of Conduct of the Institute.

e. Whenever I have used materials (data, theoretical analysis, figures, and text) from other sources, I have given due credit to them by citing them in the text of the report and giving their details in the references. Further, I have taken permission from the copyright owners of the sources, whenever necessary.

Yogi

Place: Hyderabad **Signature of the Student**

Date: 09-12-2025

CERTIFICATE

This is to certify that the project report entitled **HydroTrack** submitted by **M. Bala Yogender** to the Institute of Aeronautical Engineering, Hyderabad in partial fulfillment of the requirements for the award of the Degree Bachelor of Technology in **CSE - (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)** is a Bonafide record of work carried out by his guidance and supervision. The Contents of this report, in full or in parts, have not been submitted to any other Institute for the award of any Degree.

Supervisor **Head of the Department**

Date: 09-12-2025

Principal

APPROVAL SHEET

This project report entitled **HydroTrack** submitted by **M. Bala Yogender** is approved for the award of the Degree Bachelor of Technology in Branch **CSE (Artificial Intelligence & Machine Learning).**

Examiner **Supervisor(s)**

Principal

Date: 09-12-2025

Place: Hyderabad

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I take this opportunity to express my deepest gratitude to one and all who directly or indirectly helped me in bringing this effort to present form.

ABSTRACT

Hydro Track is a fitness-oriented, web-based application designed to help users maintain optimal hydration through an efficient and user-friendly front-end interface. Proper hydration is essential for physical health, mental alertness, and overall well-being, yet many individuals fail to meet their daily water intake requirements due to busy lifestyles and lack of awareness. Hydro Track addresses this issue by providing a simple digital platform that allows users to log daily water consumption, set personalized hydration goals, and track progress visually.

The application focuses on developing a responsive and engaging user experience using core web technologies such as HTML5, CSS3, and JavaScript. Hydro Track enables users to monitor their hydration levels using interactive elements such as progress bars, charts, and daily goal indicators. These visual tools provide immediate feedback and motivate users to maintain consistent hydration habits throughout the day.

A key emphasis of the project is on improving user engagement through clean UI/UX design principles. Minimalistic layouts, visual consistency, and intuitive controls reduce cognitive load and make the application easy to use across devices such as smartphones, tablets, and desktop computers. JavaScript-driven interactivity manages water intake calculations, progress updates, and reminder alerts without requiring backend processing.
Overall, Hydro Track demonstrates the practical application of front-end web development skills in creating a meaningful health-focused web application. It highlights the importance of usability, responsiveness, and data visualization in promoting healthy lifestyle habits and provides users with an effective tool to track and improve their daily hydration.

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

Maintaining adequate hydration is a fundamental requirement for good health, yet many individuals fail to consume sufficient water daily. Busy schedules, lack of reminders, and the absence of proper tracking

mechanisms often result in irregular water intake. Traditional methods such as mental tracking or manual notes do not provide real-time feedback, progress visualization, or motivation.
Although various fitness and health applications exist, many are complex or lack a dedicated focus on hydration tracking. Users require a simple, visually intuitive, and accessible system that allows them to monitor water intake, set personalized goals, and receive reminders to build consistent hydration habits. Therefore, there is a need for a modern front-end solution like Hydro Track that supports healthy behaviour through data visualization and timely reminders.

1.2 Introduction

Hydro Track is a modern, fitness-oriented web application designed to help users monitor, track, and improve their daily water intake. In today's fast-paced lifestyle, people often overlook the importance of drinking enough water, leading to dehydration-related health issues such as fatigue, headaches, and reduced concentration.
The application provides an intuitive interface that allows users to log water consumption easily and compare it against their daily hydration goals. Through visual indicators such as progress bars and charts, users can instantly understand their hydration status. Additionally, reminder features encourage users to drink water at regular intervals, helping them develop long-term healthy habits.
By combining simplicity, visualization, and interactivity, Hydro Track serves as an effective digital companion for personal health management and hydration awareness.

1.3 Requirements
1. Functional Requirements (Front-End)
1.1 Water Intake Tracking
FR1: The system must allow users to log daily water intake through an interactive UI.
FR2: The application must calculate and display total water consumed per day.
FR3: Users must be able to set and modify personalized daily hydration goals.
FR4: The system must visualize hydration progress using charts, progress bars, or gauges.
FR5: The interface must show remaining water required to reach the daily goal.
FR6: Client-side storage (Local Storage or Session Storage) should save daily intake data.
1.2 Reminder System
FR7: The application must display reminders for regular water intake.
FR8: Visual or notification-based alerts must be triggered at predefined intervals.
FR9: Users must be able to customize reminder frequency.
FR10: The dashboard should highlight incomplete daily goals.
FR11: A simple daily progress summary must be shown.
2. Non-Functional Requirements
NFR1: Responsive design across mobile, tablet, and desktop devices.
NFR2: Clean, intuitive, and easy-to-use interface.
NFR3: Fast UI response with minimal loading time.
NFR4: Consistent design in fonts, colours, and layouts.
NFR5: Accessibility with readable text and proper contrast.
NFR6: Accurate and reliable progress visualization.

1.4 Pre-requisites
1. Technical Pre-requisites

Knowledge of HTML5 for UI structure.
Knowledge of CSS3 for responsive layouts and styling.
Proficiency in JavaScript for calculations, interactivity, and reminders.
Familiarity with DOM manipulation.
Understanding of responsive design techniques.
Knowledge of Local Storage for client-side data storage.

2. Tool Pre-requisites

Code Editor (VS Code, Sublime Text, Atom).
Web Browsers (Chrome, Firefox, Edge).
Optional UI design tools (Figma, Canva).
Git and GitHub for version control.

3. User Pre-requisites

Basic ability to use a web application.
Understanding of daily water intake goals.
Familiarity with charts and progress indicators.

1.5 Technologies Used

1. HTML5 (Structure)

Page layout and semantic elements
Input forms for water logging

2. CSS3 (Design & Styling)

Responsive layouts using Flexbox/Grid
Visual styling for dashboards and charts
Animations and transitions

3. JavaScript (Functionality)

Water intake calculations
Progress tracking and updates
Reminder handling

4. Local Storage

Store daily water intake and goals

5. Chart.js (Optional)

Visualization of hydration progress

CHAPTER 2

REVIEW OF RELEVANT LITERATURE

Research in health science highlights the importance of adequate hydration for maintaining physical performance and cognitive efficiency. Studies show that self-monitoring and visual feedback significantly improve adherence to healthy habits. Applications that provide real-time progress indicators encourage users to stay consistent with health-related goals.

Behavioral studies emphasize the role of reminders and notifications in habit formation. Regular prompts act as external cues that help individuals remember routine activities such as drinking water. Literature also supports the use of simple, user - centered digital tools that reduce complexity while promoting engagement.

Front-end web technologies are widely used in health tracking systems due to their accessibility and responsiveness. Client-side storage mechanisms like Local Storage enable lightweight applications to retain personalized user data without backend dependency. These findings validate the design approach used in Hydro Track.

CHAPTER 3

METHODOLGY

The development of Hydro Track followed a structured front-end development methodology. The process began with requirement analysis and UI planning, focusing on simplicity and usability. Wireframes were designed to define layout and navigation flow.

HTML5 was used to create the structure of the application, including forms for water intake logging and dashboard sections. CSS3 was applied to design a clean and responsive interface using Flexbox and Grid layouts. JavaScript handled application logic such as calculating daily intake, updating progress indicators, triggering reminders, and storing data using Loca lStorage.

Below is a sample HTML implementation used in the project:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>HydroTrack</title>

<style>
  body {
    margin: 0;
    height: 100vh;
    display: flex;
```

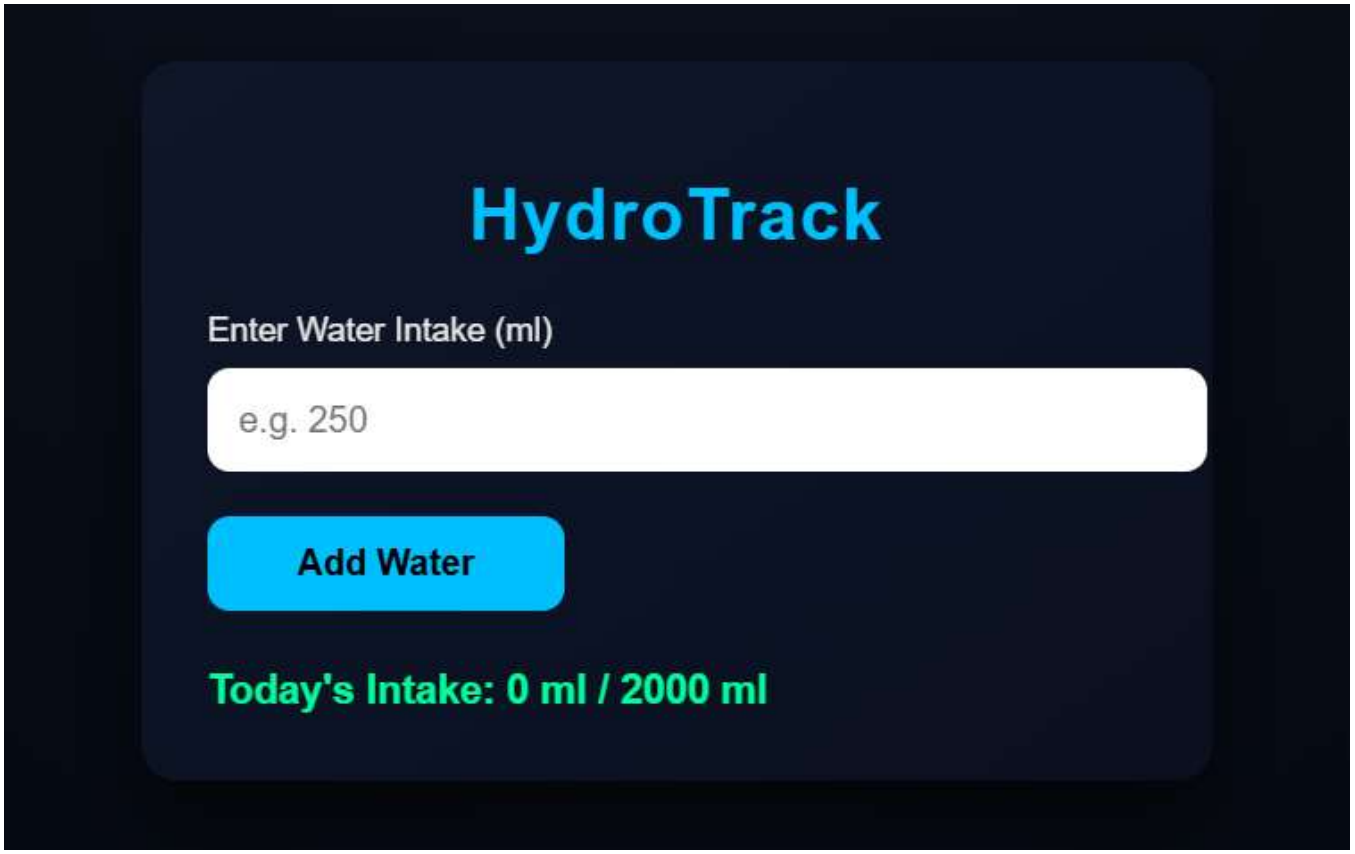
```
    justify-content: center;
    align-items: center;
    background: radial-gradient(circle at top, #0b1220, #05080f);
    font-family: Arial, Helvetica, sans-serif;
    color: white;
}

.card {
    width: 420px;
    background: linear-gradient(145deg, #0e1628, #0a1020);
    border-radius: 16px;
    padding: 30px;
    box-shadow: 0 20px 40px rgba(0,0,0,0.6);
}

h1 {
    text-align: center;
    color: #00bfff;
    margin-bottom: 25px;
    letter-spacing: 1px;
}

label {
    font-size: 15px;
    margin-bottom: 8px;
    display: block;
    color: #eaeaea;
```

```
}

input {
    width: 100%;
    padding: 14px;
    border-radius: 10px;
    border: none;
    outline: none;
    font-size: 16px;
    margin-bottom: 20px;
}

button {
    width: 160px;
    padding: 12px;
    background: #00bfff;
    border: none;
    border-radius: 10px;
    font-size: 16px;
    font-weight: bold;
    cursor: pointer;
    transition: 0.2s;
}

button:hover {
    background: #00e1ff;
    transform: scale(1.05);
```

```
    }

    .intake {
        margin-top: 25px;
        font-size: 18px;
        color: #00ff99;
        font-weight: bold;
    }
</style>
</head>

<body>

<div class="card">
    <h1>HydroTrack</h1>

    <label>Enter Water Intake (ml)</label>
    <input type="number" id="waterInput" placeholder="e.g. 250">

    <button onclick="addWater()">Add Water</button>

    <div class="intake" id="status">
        Today's Intake: 0 ml / 2000 ml
    </div>
</div>

<script>
```

```
    let total = 0;
    const goal = 2000;

    function addWater() {
        let value = Number(document.getElementById("waterInput").value);

        if (value <= 0) {
            alert("Please enter a valid amount");
            return;
        }

        total += value;
        if (total > goal) total = goal;

        document.getElementById("status").innerText =
            `Today's Intake: ${total} ml / ${goal} ml`;

        document.getElementById("waterInput").value = "";
    }
</script>

</body>
</html>
```

OUTPUT



CHAPTER 4

RESULTS AND DISCUSSIONS

The implementation of Hydro Track successfully met its objectives. Users were able to log water intake easily and visualize progress toward daily hydration goals. The progress indicators provided clear feedback, motivating users to complete their daily intake.
Reminder features helped improve consistency in water consumption. The application performed reliably across different devices, maintaining responsiveness and usability. Client-side data persistence ensured continuity without server-side processing.
Overall, the results confirm that front-end technologies are sufficient to develop an effective, user-friendly hydration tracking application.

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

Hydro Track effectively demonstrates the application of front-end web development techniques in promoting healthy hydration habits. By integrating water tracking, goal setting, visualization, and reminders into a single platform, the application supports consistent and mindful water consumption. The project emphasizes usability, responsiveness, and simplicity, making it a practical health-focused web application.

5.2 Future Scope

Future enhancements may include:

- Backend integration for cloud data storage
- Weekly and monthly hydration analytics
- Smart device or sensor integration
- Push notifications and alerts
- Personalized hydration recommendations
- Theme customization and motivational content

With these additions, Hydro Track can evolve into a comprehensive hydration and wellness management system.

REFERENCES

1. Health and hydration research articles
2. Front-end web development documentation
3. Studies on habit formation and digital reminders