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

Complex Problem-Solving Self-Assessment Form

1	Name of the Student	R. RITHISH RATHOD
2	Roll Number	25951A66F6
3	Branch and Section	CSE-(AI&ML) – C
4	Program	B. Tech
5	Course Name	FRONT-END WEB DEVELOPMENT LABORATORY (FEWDL)
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: 08-12-2025

Rithish Rathod

Signature of the Student

COMPLEX ENGINEERING PROBLEM

A COURSE SIDE PROJECT

ON

Hydro Track

R. RITHISH RATHOD

25951A66F6

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

R. RITHISH RATHOD
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DECLARATION

I certify that

a. The work contained in this report entitled **"Hydro Track"** 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.

Rithish Rathod

Place: Hyderabad **Signature of the Student**

Date: 08-12-2025

CERTIFICATE

This is to certify that the project report entitled **"Hydro Track"** submitted by **R.RITHISH RATHOD** to the **Institute of Aeronautical Engineering, Hyderabad**, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in **CSE - (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING),** is a bonafide record of work carried out by him/her under my guidance and supervision.

The contents of this report, in full or in parts, have not been submitted to any other Institute or University for the award of any Degree or Diploma.

Supervisor **Head of the Department**

Date: 08-12-2025

Principal

APPROVAL SHEET

This project report entitled **Hydro Track** submitted by ***R.RITHISH RATHOD*** is approved for the award of the Degree Bachelor of Technology in Branch **CSE (Artificial Intelligence & Machine Learning).**

Examiner **Supervisor(s)**

Principal

Date: 08-12-2025

Place: Hyderabad

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ABSTRACT

Hydro Track is a fitness-oriented front-end web application developed to help users monitor and maintain their daily water intake effectively. Proper hydration is essential for maintaining physical health, improving concentration, and supporting overall body functions, yet many individuals fail to track their water consumption regularly. The lack of a simple and organized tracking system often leads to dehydration and unhealthy habits.

The Hydro Track application provides a user-friendly interface that enables users to record daily water intake, set hydration goals, receive reminder notifications, and visualize their progress through charts. By presenting hydration data in a clear and structured manner, the system helps users understand their drinking patterns and encourages consistent water consumption.

The project is developed using front-end web technologies such as HTML and CSS, focusing on simplicity, responsiveness, and visual clarity. Hydro Track demonstrates the practical application of front-end development concepts in the fitness and health domain. Overall, the project serves as an effective tool for promoting healthy hydration habits and highlights how web technologies can be used to address real-world lifestyle challenges.

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CHAPTER 1 : INTRODUCTION

1.1 Problem Statement

Maintaining adequate daily water intake is essential for good health, yet many individuals fail to consume sufficient water due to lack of tracking, reminders, or awareness. Traditional methods such as manual notes or memory-based tracking are unreliable and inconsistent. The absence of a simple digital tool to monitor hydration leads to dehydration-related health issues, reduced physical performance, and poor lifestyle habits.

There is a need for a simple, accessible, and visually clear web-based solution that helps users track water intake, stay reminded, and analyze hydration patterns effectively.

1.2 Introduction

Hydration is a key component of fitness and overall well-being. Drinking adequate water helps regulate body temperature, supports digestion, improves concentration, and enhances physical performance. Despite its importance, many people fail to track their daily water intake.

Hydro Track is a front-end web application designed to assist users in monitoring their daily hydration levels. It allows users to record water intake, set daily goals, receive reminders, and view progress through charts. The application focuses on simplicity, ease of use, and visual clarity, making hydration tracking effortless and engaging.

1.3 Requirements

1. Functional Requirements

- Users can log daily water intake.
- Users can set a daily water consumption goal.
- Visual charts display daily progress.
- Reminder messages encourage timely water intake.
- Clear display of remaining water to be consumed.

2. Technical Requirements

- Frontend: HTML, CSS
- Browser: Chrome / Firefox / Edge
- Operating System: Windows / Linux
- Hardware: Minimum 4 GB RAM, basic processor

1.4 Prerequisites

To develop the Hydro Track application, basic knowledge of web development is required. This includes understanding HTML for structuring content and CSS for styling and layout design. Familiarity with responsive design principles helps ensure usability across different screen sizes. A code editor such as Visual Studio Code and a modern web browser are sufficient for development and testing.

1.5 Technologies

HTML – for structuring the web pages
CSS – for styling, layout, and responsiveness
Web Browser – for testing and deployment

CHAPTER 2

REVIEW OF RELEVANT LITERATURE

Hydration monitoring has gained significant attention in recent years due to its direct impact on human health, fitness, and cognitive performance. Medical and fitness research consistently emphasizes that adequate water intake is essential for maintaining body temperature, supporting metabolism, improving digestion, enhancing physical endurance, and ensuring proper functioning of organs. Studies indicate that even mild dehydration can lead to fatigue, reduced concentration, headaches, and decreased physical performance.

Several research works highlight that individuals often underestimate their daily water consumption when relying on memory or manual methods. Traditional approaches such as mental estimation or handwritten notes are prone to inaccuracies and inconsistency. This has led to the development of digital hydration monitoring tools that provide structured tracking and reminders. According to fitness technology studies, digital tracking systems significantly improve user compliance and awareness compared to manual tracking techniques.

Web-based health and fitness applications have become increasingly popular due to their accessibility, ease of use, and platform independence. Literature on front-end web applications in the health domain shows that simple, intuitive interfaces encourage higher user engagement and long-term usage. Researchers emphasize that minimalistic design, clear visual indicators, and goal-based tracking are key factors in improving user motivation. Progress charts and visual feedback have been shown to positively influence user behavior by providing instant understanding of performance levels.

Several hydration tracking systems described in existing literature include features such as daily intake goals, reminder notifications, and historical data visualization. These features help users establish consistent hydration habits over time. Studies also suggest that reminder-based systems play a crucial role in habit formation, especially in fitness-related applications. Timely reminders prompt users to drink water at regular intervals, reducing the risk of dehydration during busy schedules.

From a technical perspective, literature on front-end development emphasizes the importance of separating content structure and presentation. HTML is widely recognized as the standard language for structuring web content, while CSS is used to enhance visual presentation, layout, and responsiveness. Research in web usability highlights that responsive design ensures accessibility across different devices and screen sizes, which is particularly important for health-related applications that users may access frequently throughout the day.

User experience (UX) studies further indicate that health monitoring applications should avoid complexity and focus on clarity. Overly complex interfaces can discourage users, whereas simple layouts with clear indicators improve usability and satisfaction. Visual representations such as progress bars, charts, and color-coded indicators are recommended for conveying quantitative data like water intake effectively.
In addition, literature on fitness behavior change suggests that self-monitoring tools increase user accountability and awareness. By visualizing daily progress, users become more conscious of their hydration habits and are more likely to meet their daily goals. This aligns with behavioral science research, which states that feedback mechanisms are essential for sustaining healthy lifestyle changes.

Overall, the reviewed literature supports the development of Hydro Track as a front-end web application that focuses on simplicity, visual clarity, and user engagement. By incorporating established principles from fitness research, health monitoring systems, and front-end web design, Hydro Track addresses the limitations of traditional hydration tracking methods. The application aligns with existing research findings by offering structured tracking, reminders, and visual feedback, making it a practical and effective solution for promoting healthy hydration habits.

CHAPTER 3 : METHODOLGY

The development of the Hydro Track application follows a systematic and structured methodology to ensure clarity, usability, and effective implementation of hydration tracking features. Since the project is a front-end web development application, the methodology primarily focuses on interface design, content structuring, visual representation, and user interaction. The overall approach emphasizes simplicity, responsiveness, and user-friendly design principles.

3.1 Problem Identification and Requirement Analysis :

The first step in the methodology involved identifying the core problem of inadequate hydration monitoring among individuals. Many users lack awareness of their daily water intake and fail to maintain consistent hydration habits due to busy routines or absence of tracking mechanisms. From this problem, the primary requirements were identified, including water intake tracking, goal setting, reminders, and progress visualization.

Requirement analysis helped define the scope of the project clearly. Since the application is limited to front-end development, the focus was placed on designing a static yet informative interface that demonstrates how hydration data can be presented effectively. Functional and non-functional requirements were outlined to guide the design and development process.

3.2 System Design and Architecture:

The system design phase involved planning the structure and layout of the Hydro Track application. A modular design approach was adopted, where the application is divided into logical sections such as header, intake display, progress visualization, reminder section, and footer. This modular structure improves readability, maintainability, and scalability of the design.

The architecture of the application follows a simple client-side model. HTML is used to define the structural elements of the web page, while CSS is responsible for styling, layout management, and responsiveness. The separation of structure and presentation ensures a clean and organized development approach.

3.3 User Interface Design:

User Interface (UI) design plays a critical role in the success of fitness and health applications. The UI of Hydro Track was designed with a focus on simplicity, clarity, and ease of navigation. Minimal colors, readable fonts, and proper spacing were used to avoid visual clutter.
The interface includes clearly labeled sections for daily water intake, hydration goals, and

progress indicators. Visual elements such as progress bars and charts are designed using CSS to represent water consumption in an intuitive manner. The design ensures that users can quickly understand their hydration status at a glance.

3.4 Front-End Development Using HTML:

HTML is used as the core technology for structuring the Hydro Track application. Semantic HTML elements such as header, section, div, and footer are utilized to organize content logically. Each section of the application is defined clearly, improving accessibility and readability.

The intake tracking section displays water consumption details, while the goal section shows the target intake. The progress visualization section presents hydration data in a structured format. Proper use of headings, paragraphs, and lists ensures consistency across the application.

3.5 Styling and Layout Using CSS :

CSS is used extensively to enhance the visual appearance and layout of the application. Styling techniques such as color schemes, typography, spacing, and alignment are applied to create a clean and modern look. CSS box model properties are used to control margins, padding, and borders effectively.

Layout techniques such as flexbox are employed to align elements properly and maintain responsiveness across different screen sizes. Responsive design principles ensure that the application adapts well to desktops, tablets, and mobile devices. This enhances accessibility and usability.

3.6 Visualization of Water Intake Data:

Visualization is an essential component of Hydro Track, as it helps users understand their hydration progress easily. Progress bars and chart-like representations are created using CSS to visually depict daily water intake relative to the set goal. These visual indicators provide instant feedback and motivate users to achieve their hydration targets.

Color-coded indicators are used to represent different levels of completion, making the data more intuitive. This approach aligns with research findings that visual feedback significantly improves user engagement and behavior change.

3.7 Reminder Representation

Although the application does not use dynamic scripting, reminder messages are visually represented through static text and design cues. The reminder section highlights hydration prompts that encourage users to drink water at regular intervals. This demonstrates the conceptual implementation of reminder systems in fitness applications.

3.8 Testing and Validation

The Hydro Track interface was tested across different web browsers to ensure consistent appearance and functionality. Layout testing was conducted on various screen sizes to verify responsiveness. Visual elements, spacing, and alignment were reviewed to ensure clarity and ease of use.

Usability testing involved evaluating the interface from a user perspective to ensure that information is easily understandable and navigation is intuitive. Feedback from peers helped refine the design and improve overall presentation.

3.9 Implementation Outcome

The methodology resulted in a well-structured, visually appealing, and easy-to-use front-end application. Hydro Track successfully demonstrates how HTML and CSS can be used to design a fitness-oriented web application focused on hydration tracking. The structured approach ensures that the application meets its objectives and serves as a practical example of front-end web development concepts.

HAPTER 4 :RESULTS AND DISCUSSIONS

The Hydro Track interface successfully presents water intake data in a clear and visually appealing format. Users can easily understand their hydration status through progress indicators and charts. The reminder messages improve user awareness and motivation.
The clean design and simple layout make the application easy to use for all age groups. The project demonstrates how front-end technologies can be effectively applied to health and fitness-related applications.

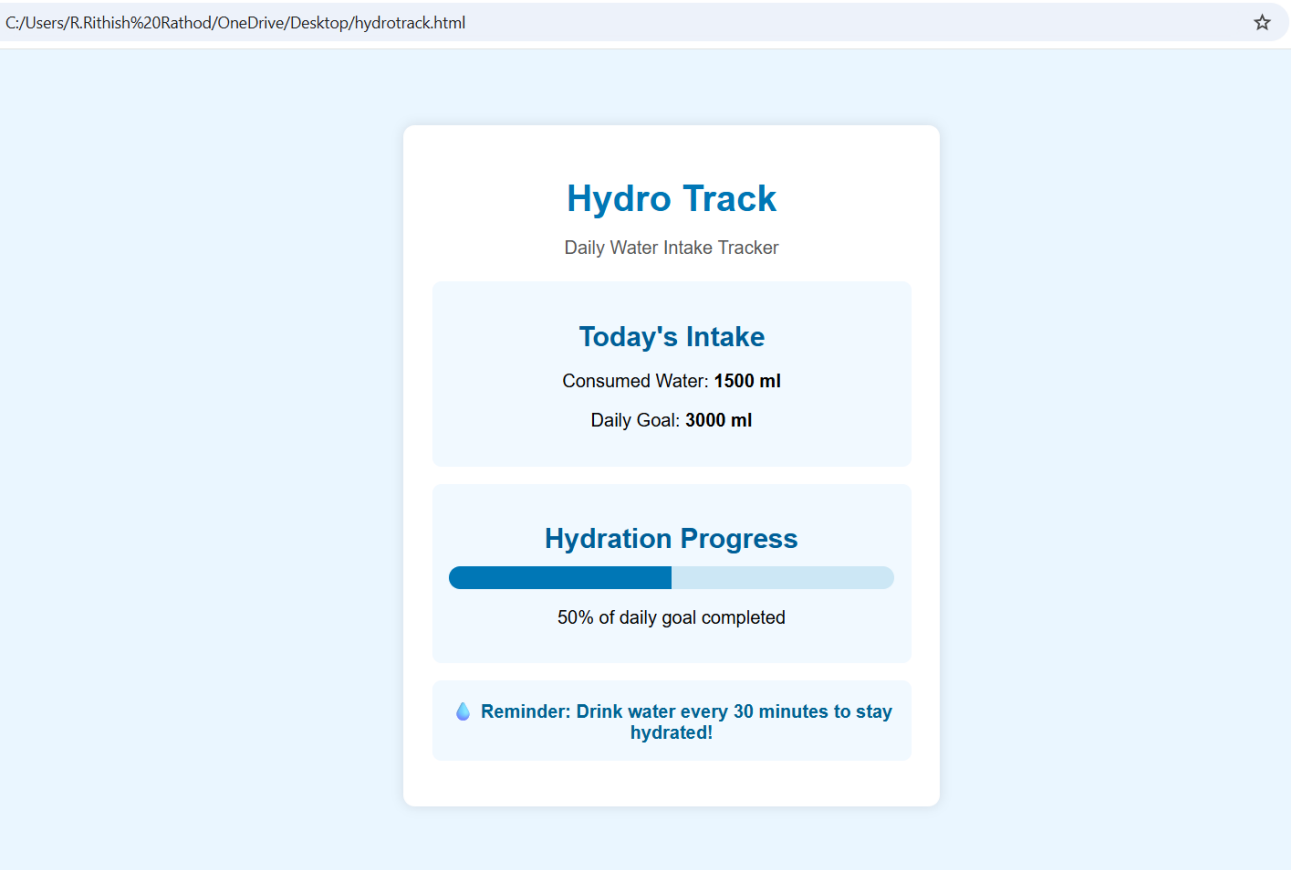
HTML CODE

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Hydro Track</title>
  <style>
    body {
      margin: 0;
      padding: 0;
      font-family: Arial, sans-serif;
      background-color: #eaf6ff;
      height: 100vh;
      display: flex;
      justify-content: center;
      align-items: center;
    }

    .container {
      background-color: #ffffff;
      width: 420px;
      padding: 25px;
      border-radius: 10px;
      box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
      text-align: center;
    }
```

```
h1 {
  color: #0077b6;
  margin-bottom: 5px;
}

.subtitle {
  color: #555;
  margin-bottom: 20px;
}

.box {
  background-color: #f1f9ff;
  padding: 15px;
  margin: 15px 0;
  border-radius: 8px;
}

.box h2 {
  color: #005f99;
  margin-bottom: 10px;
}

.progress-bar {
  width: 100%;
  height: 20px;
  background-color: #cce7f5;
  border-radius: 10px;
  overflow: hidden;
  margin-top: 10px;
}

.progress-fill {
  width: 50%;
  height: 100%;
  background-color: #0077b6;
```

```
    }

    .reminder {
      color: #006494;
      font-weight: bold;
    }
  </style>
</head>
<body>

  <div class="container">
    <h1>Hydro Track</h1>
    <p class="subtitle">Daily Water Intake Tracker</p>

    <div class="box">
      <h2>Today's Intake</h2>
      <p>Consumed Water: <strong>1500 ml</strong></p>
      <p>Daily Goal: <strong>3000 ml</strong></p>
    </div>

    <div class="box">
      <h2>Hydration Progress</h2>
      <div class="progress-bar">
        <div class="progress-fill"></div>
      </div>
      <p>50% of daily goal completed</p>
    </div>

    <div class="box reminder">
      💧 Reminder: Drink water every 30 minutes to stay hydrated!
    </div>
  </div>

</body>
</html>
```

OUTPUT:


C:/Users/R.Rithish%20Rathod/OneDrive/Desktop/hydrotrack.html
Hydro Track
Daily Water Intake Tracker
Today's Intake
Consumed Water: 1500 ml
Daily Goal: 3000 ml
Hydration Progress
50% of daily goal completed
Reminder: Drink water every 30 minutes to stay hydrated!

CHAPTER 5 :CONCLUSION AND FUTURE SCOPE

5.1 Conclusions:

The Hydro Track project successfully demonstrates the design and implementation of a front-end web application focused on hydration tracking in the fitness and health domain. The primary objective of the project was to create a simple, user-friendly interface that helps users monitor their daily water intake, understand hydration levels, and develop healthy hydration habits. Using HTML and CSS, the project effectively showcases how front-end web technologies can be applied to real-world health-related problems.

The application provides clear visualization of daily water intake through structured layouts and progress indicators, making hydration data easy to understand at a glance. The inclusion of reminder messages reinforces the importance of regular water consumption and supports awareness among users. The clean design, minimalistic layout, and responsive structure contribute to a positive user experience, ensuring accessibility across different devices and screen sizes.

Through this project, essential front-end development concepts such as semantic HTML, CSS styling, layout management, and responsive design have been successfully applied. Hydro Track meets its functional objectives within the defined scope and serves as an effective prototype for a hydration monitoring system. Overall, the project highlights the importance of simplicity, visual clarity, and usability in fitness-oriented web applications.

5.2 Future Scope:

Although Hydro Track fulfills its objectives as a front-end prototype, there is significant scope for further enhancement and expansion. Future improvements can include the integration of JavaScript to enable dynamic data entry, real-time progress updates, and interactive user controls. Adding backend support with a database would allow user authentication, data storage, and long-term tracking of hydration history.

The application can be extended to include mobile-friendly notifications and automated reminders through browser alerts or mobile applications. Integration with fitness devices or health platforms can further enhance accuracy and usability. Additional features such as personalized hydration goals based on age, weight, and activity level can improve effectiveness.

Advanced visualization techniques, analytics dashboards, and performance insights can provide users with deeper understanding of their hydration patterns. Multi-language support and accessibility enhancements can make the application suitable for a wider audience. With these enhancements, Hydro Track has the potential to evolve into a comprehensive hydration and fitness management system.

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