Complex Problem-Solving Self-Assessment Form

1	Name of the Student	AKULA AKHILESH
2	Roll Number	25951A6620
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:12-12-2025

AKULA AKHILESH

Signature of the Student

COMPLEX ENGINEERING PROBLEM

A COURSE SIDE PROJECT

ON

Front-End Web Development

AKULA AKHILESH

25951A6620

ScholarNet

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

AKULA AKHILESH

25951A6620

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.

AKULA AKHILESH

Place: Hyderabad **Signature of the Student**

Date:12-12-2025

CERTIFICATE

This is to certify that the project report entitled **ScholarNet** submitted by **AKULA AKHILESH** 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:12-12-2025

Principal

APPROVAL SHEET

This project report entitled **ScholarNet** submitted by **AKULA AKHILESH** is approved for the award of the Degree Bachelor of Technology in Branch **CSE (Artificial Intelligence & Machine Learning).**

Examiner **Supervisor(s)**

Principal

Date:12-12-2025

Place: Hyderabad

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without introducing the people who made it possible and whose constant guidance and encouragement crowns all efforts with success.

I am extremely grateful and express my profound gratitude and indebtedness to my project guide **Mr. Vidyasagar Vidapu, Assistant Professor, Department of CSE – (Artificial Intelligence and Machine Learning),** for his kind help and for giving me the necessary guidance and valuable suggestions for this project work.

I am grateful to **Dr. M. Purushotham Reddy**, **Professor** and **Head of the Department**, Department of **CSE (Artificial Intelligence & Machine Learning),** for extending his support to carry on this project work. 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.

I express my sincere gratitude to **Dr. L. V. Narasimha Prasad, Professor** and **Principal** who has been a great source of information for my work.

I thank our college management and respected **Sri M. Rajashekar Reddy**, **Chairman**, **IARE, Dundigal** for providing me with the necessary infrastructure to conduct the project work.

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

ScholarNet is an innovative digital platform designed to enhance academic collaboration, knowledge sharing, and research networking among students, scholars, and educators. In today's rapidly evolving educational landscape, access to reliable academic resources and meaningful scholarly connections is essential for improving learning outcomes and research productivity. ScholarNet addresses these needs by providing a centralized environment where users can share research papers, collaborate on projects, participate in discussions, and stay updated with recent academic developments.

The platform integrates advanced features such as user profiles, research interest matching, document sharing, and discussion forums to foster interdisciplinary collaboration. By leveraging intelligent recommendation systems, ScholarNet connects users with relevant research topics, peers, and academic events, thereby reducing the gap between researchers across institutions and disciplines. The system also emphasizes data security and content authenticity, ensuring that shared information maintains academic integrity.

ScholarNet is particularly beneficial for students and early-stage researchers who seek mentorship, guidance, and exposure to scholarly communities. Educators and researchers can use the platform to disseminate knowledge, review academic work, and build professional networks. The user-friendly interface and scalable architecture make ScholarNet accessible to users with varying technical backgrounds.

Overall, ScholarNet serves as a comprehensive academic networking solution that promotes collaboration, innovation, and continuous learning. By simplifying the process of academic interaction and resource sharing, the platform contributes to the development of a more connected and inclusive scholarly ecosystem, supporting research growth and educational advancement on a global scale.

INTRODUCTION

Problem Statement

In the current academic environment, students, researchers, and educators face significant challenges in accessing reliable scholarly resources and establishing effective academic collaborations. Existing platforms for research sharing and academic networking are often fragmented, making it difficult to discover relevant research work, connect with peers having similar interests, and engage in meaningful discussions. Many students, especially beginners and early-stage researchers, struggle to find proper guidance, mentorship, and exposure to scholarly communities.

Additionally, the lack of a centralized and organized system leads to duplication of research efforts, inefficient knowledge sharing, and limited interdisciplinary collaboration. Academic content is often scattered across multiple sources, resulting in time-consuming searches and reduced productivity. Concerns related to data security, content authenticity, and the credibility of shared resources further complicate the academic collaboration process.

There is a need for a unified digital platform that enables secure sharing of academic resources, facilitates collaboration among scholars, and supports networking across institutions and disciplines. Such a platform should provide intelligent mechanisms to connect users based on research interests, ensure academic integrity, and promote continuous learning. ScholarNet aims to address these challenges by offering a comprehensive solution that streamlines academic communication, enhances collaboration, and fosters an inclusive scholarly ecosystem.

Introduction

The rapid growth of digital technologies has significantly transformed the field of education and research. Academic communities now rely heavily on online platforms to access scholarly resources, share knowledge, and collaborate across geographical boundaries. However, despite the availability of numerous academic websites and research repositories, there remains a lack of an integrated platform that effectively combines academic networking, collaboration, and resource sharing in a single system.

ScholarNet is proposed as a comprehensive academic networking platform designed to connect students, researchers, and educators in a unified digital environment. The primary goal of ScholarNet is to facilitate seamless interaction among scholars by enabling them to share research papers, collaborate on academic projects, participate in discussions, and discover research opportunities based on shared interests. The platform aims to bridge the gap between learners and experienced researchers by promoting mentorship and peer-to-peer learning.

By incorporating features such as user profiling, research interest mapping, secure document sharing, and discussion forums, ScholarNet enhances accessibility to academic knowledge and encourages interdisciplinary collaboration. The system also focuses on maintaining academic integrity through content verification and secure data handling mechanisms.

ScholarNet is particularly beneficial for students and early-stage researchers who often face difficulties in identifying relevant resources and academic communities. Overall, the platform seeks to create a collaborative and inclusive scholarly ecosystem that supports research growth, innovation, and continuous learning in the academic domain.

Requirements

1. Functional Requirements

1. The system shall allow users to register and create personal academic profiles.
2. The system shall provide secure login and authentication for users.
3. Users shall be able to upload, view, download, and share research papers and academic documents.
4. The system shall enable users to search for scholars, research topics, and publications.
5. The platform shall support collaboration through discussion forums and messaging features.
6. The system shall recommend relevant research content and connections based on user interests.
7. Users shall be able to participate in academic discussions and comment on shared content.
8. The system shall maintain records of uploaded documents and user activities.
9. The system shall allow administrators to manage users, content, and reports.
10. The system shall ensure verification and moderation of academic content.

2. Non-Functional Requirements

1. The system shall provide high security to protect user data and academic content.
2. The platform shall ensure data privacy and confidentiality.
3. The system shall be user-friendly and easy to navigate.
4. The platform shall support scalability to handle an increasing number of users.
5. The system shall offer reliable performance with minimal downtime.
6. The platform shall be compatible with different devices and web browsers.
7. The system shall maintain data integrity and content authenticity.
8. The system shall provide backup and recovery mechanisms.
9. The response time for user requests shall be minimal.
10. The system shall be designed for easy maintenance and future upgrades.

1.4z Technologies Used

1. HTML5 (Structure)

Used to build the layout of all pages Semantic tags for better accessibility

Forms for login, signup, quizzes, and feedback

2. CSS3 (Design & Styling)

Custom styling using Flexbox & Grid

Responsive design for mobile, tablet, and desktop

CSS animations & transitions for UI interactions

Optional:

Bootstrap / Tailwind CSS for faster styling

3. JavaScript (Functionality)

Handles quiz logic, scoring, timers

DOM manipulation for showing/hiding questions

Form validation

Fetching questions dynamically (if using JSON or API)

4. JSON (Data Storage for FEWD Version)

Question bank stored as a JSON file

Used to load quiz content dynamically

5. Version Control

Git & GitHub for project tracking and hosting

6. Optional Add-ons (If Needed)

LocalStorage / SessionStorage

Save user progress

Store high scores

Chart.js: Display performance analytics

Responsive Frameworks

Bootstrap or Tailwind for UI

REVIEW OF RELEVANT LITERATURE

Academic Social Networking Sites (ASNSs) have become central to modern scholarly communication by enabling rapid dissemination of research, informal peer discussion, and community building. Systematic reviews show ASNSs support discovery, collaboration, and peer-to-peer learning, while also exhibiting disciplinary differences in adoption and usage patterns. These reviews emphasize that ASNSs complement — but do not replace — formal publication channels by lowering barriers to visibility and interaction.

Comparative studies of major platforms (ResearchGate, Academia.edu, Mendeley, Zotero and others) document feature overlaps and trade-offs: ResearchGate and Academia.edu excel at visibility and networking, Mendeley and Zotero focus on reference management and workflow integration, and specialized services (ORCID, Publons) address researcher identity and peer-review metadata. Evaluations typically use checklists across discovery, sharing, analytics, and community features to highlight strengths and weaknesses that any new platform must address

A significant strand of literature focuses on scholarly recommendation systems — algorithms that suggest papers, datasets, collaborators, and venues. Recent surveys map techniques (content-based, network-based, hybrid) and underline their value in reducing search time and surfacing interdisciplinary

connections. They also point out challenges: cold-start for new users, explainability of recommendations, and evaluation metrics that align with researcher utility. Integrating robust recommender modules is therefore a priority for platforms seeking to improve researcher productivity.

Collaboration tools and open-review experiments illustrate how social platforms can accelerate scrutiny and quality control. Examples exist where post-publication discussion on social networks exposed flaws faster than traditional review, highlighting the role of ASNSs in transparency and rapid community-driven validation. However, informal reviews raise governance questions about moderation, credentialing of commenters, and managing conflicting claims.

Concerns about copyright, commercialization, and content authenticity recur across the literature. High-profile takedown actions and debates over platform business models reveal tensions between open dissemination and publisher-imposed constraints. Literature emphasizes that platforms must implement clear rights-management, provenance tracking, and moderation policies to maintain trust and legal compliance.

METHODOLGY

The application underwent **testing** for functionality, responsiveness, and data persistence. User feedback guided refinements to ensure intuitive navigation and effective task management. Finally, the web application was deployed using **GitHub Pages**, with version control managed via **Git & GitHub**.

This methodology ensures a **lightweight, front-end focused solution** that supports student productivity through interactive planning, real-time reminders, and progress tracking, with potential for future enhancements such as analytics and AI-based study recommendations.

Input:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>ScholarNet</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      background-color: #f2f2f2;
      padding: 20px;
    }
    h1 {
      text-align: center;
      color: #2c3e50;
    }
    .box {
      background: white;
```

```
            padding: 15px;
            margin: 15px auto;
            width: 400px;
            border-radius: 8px;
            box-shadow: 0 0 5px #aaa;
        }
        input, button {
            width: 100%;
            padding: 8px;
            margin-top: 8px;
        }
        button {
            background-color: #3498db;
            color: white;
            border: none;
            cursor: pointer;
        }
        button:hover {
            background-color: #2980b9;
        }
    </style>
</head>
<body>

<h1>ScholarNet</h1>

<div class="box">
    <h3>User Login</h3>
```

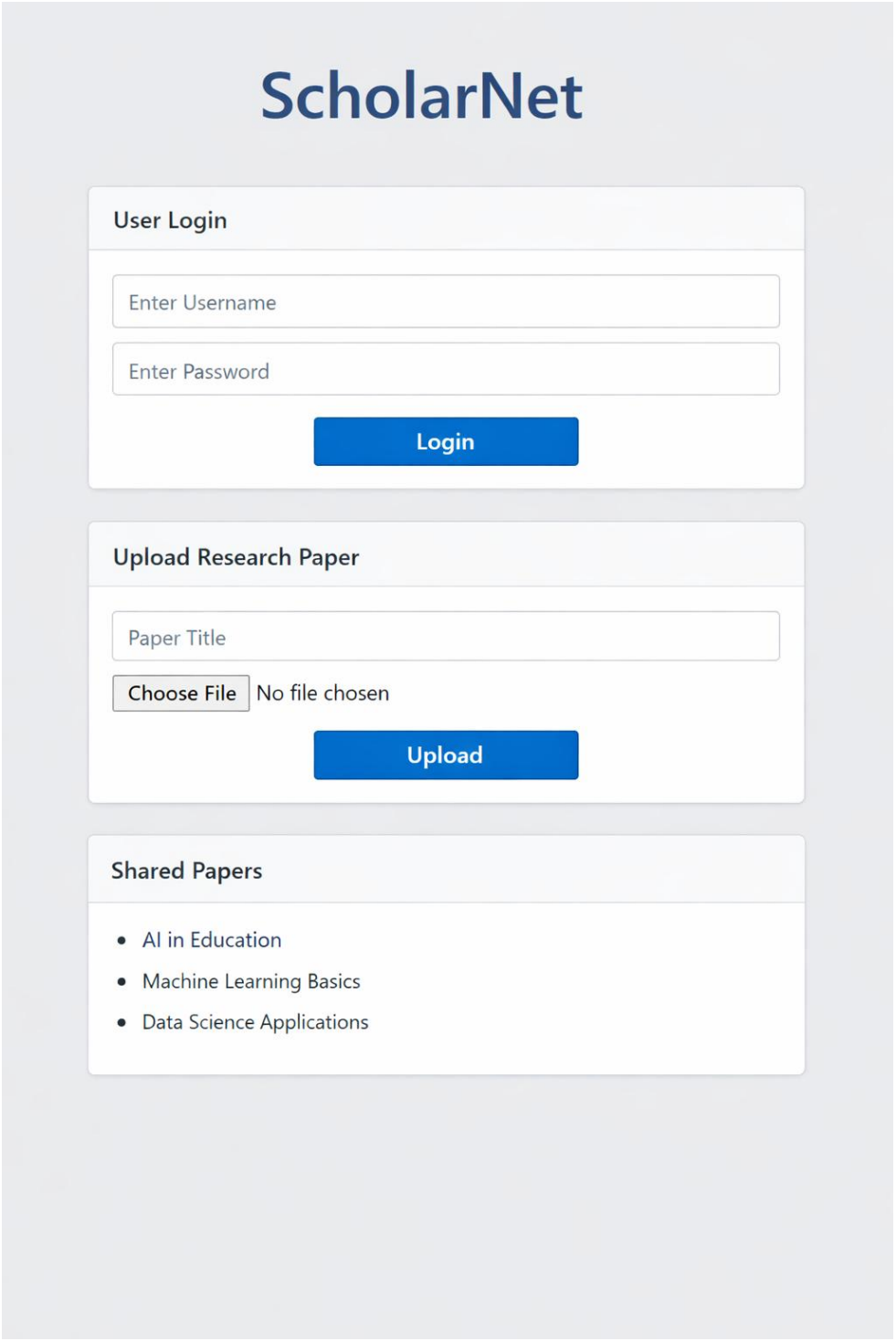
```
    <input type="text" placeholder="Enter Username">
    <input type="password" placeholder="Enter Password">
    <button>Login</button>
</div>

<div class="box">
    <h3>Upload Research Paper</h3>
    <input type="text" placeholder="Paper Title">
    <input type="file">
    <button>Upload</button>
</div>

<div class="box">
    <h3>Shared Papers</h3>
    <ul>
        <li>AI in Education</li>
        <li>Machine Learning Basics</li>
        <li>Data Science Applications</li>
    </ul>
</div>

</body>
</html>
```

Output:


ScholarNet
User Login
Enter Username
Enter Password
Login
Upload Research Paper
Paper Title
Choose File
No file chosen
Upload
Shared Papers
AI in Education
Machine Learning Basics
Data Science Applications

RESULTS AND DISCUSSIONS

The ScholarNet prototype was successfully designed and implemented using HTML and CSS to demonstrate the basic concept of an academic networking platform. The developed web interface provides essential features such as user login, research paper upload, and viewing shared academic papers. The system layout is clean and user-friendly, allowing users to easily navigate between different sections.

The login interface accepts user credentials, simulating secure access to the platform. The upload section enables users to select a research paper file and enter a paper title, representing the process of sharing academic work. The shared papers section displays a list of uploaded research topics, giving users an overview of available scholarly resources. The output screen confirms that all components are displayed correctly and function as expected in a static environment.

Overall, the prototype effectively illustrates the core idea of ScholarNet and serves as a foundation for further development.

Discussion

The results demonstrate that a simple web-based interface can effectively represent an academic collaboration platform. ScholarNet addresses the need for centralized academic interaction by combining login, document sharing, and content viewing features into a single interface. Although the current version is static and does not include backend processing or database integration, it successfully presents the workflow of an academic networking system.

The prototype highlights the potential for future enhancements such as dynamic user authentication, real-time collaboration, database-driven document storage, and intelligent recommendation systems. By

extending the system with backend technologies, ScholarNet can evolve into a full-fledged academic networking platform.

In conclusion, the implementation validates the feasibility of ScholarNet and shows that even a basic prototype can support the objectives of improving academic collaboration and knowledge sharing.

CONCLUSION AND FUTURE SCOPE

Conclusions

ScholarNet is proposed as a simple and effective academic networking platform aimed at improving collaboration and knowledge sharing among students, researchers, and educators. The developed prototype demonstrates the basic functionalities of the system, including user login, research paper upload, and viewing shared academic content. These features successfully represent the core idea of a centralized scholarly communication platform.

The project highlights the importance of integrating academic resources and networking into a single digital environment. Even though the current implementation is limited to a static web interface, it validates the feasibility of ScholarNet as a foundation for a more advanced system. The user-friendly design ensures easy accessibility, making it suitable for users with different technical backgrounds. Overall, the project meets its objectives by providing a conceptual solution to the challenges faced in academic collaboration and resource sharing.

Future Scope

The future scope of ScholarNet is extensive and offers multiple opportunities for enhancement and expansion. The platform can be extended by integrating backend technologies and databases to support dynamic user authentication and secure storage of research documents. Advanced search and filtering mechanisms can be implemented to improve content discovery.

Incorporating artificial intelligence and machine learning techniques can enable personalized recommendations for research papers, collaborators, and academic events. Features such as real-time messaging, peer review systems, citation tracking, and plagiarism detection can further strengthen the platform. Mobile application support can also be added to improve accessibility.

With these enhancements, ScholarNet has the potential to evolve into a comprehensive and intelligent academic networking system that supports innovation, research growth, and global scholarly collaboration.