# MARKDOWN NOTES APP

**A Minor Project-I Report**
**Submitted in Partial fulfillment for the award of**
**Bachelor of Technology, Department of CSE (IoT & Cyber Security including Blockchain Technology)**

Submitted to
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA**
**BHOPAL (M.P)**

**MINOR PROJECT-I REPORT**
Submitted by


Meghna Tiwari [0103IS231109]
Nishtha Mehrotra [0103IS231121]
Riddhima Jain [0103IS231151]
Pari Shivhare [0103IS231126]


Under the supervision of
Dr. Subodhini Gupta
Professor

**Department of CSE-IoT**
**Lakshmi Narain College of Technology, Bhopal (M.P.)**
**Session**
**2025-26**

LAKSHMI NARAIN COLLEGE OF TECHNOLOGY, BHOPAL

**DEPARTMENT OF CSE-IoT**


## CERTIFICATE

This is to certify that the work embodied in this project work entitled **"MARKDOWN NOTES APP"** has been satisfactorily completed by the Meghna Tiwari (0103IS231109), Nishtha Mehrotra (0103IS231121), Riddhima Jain (0103IS231151), Pari Shivhare (0103IS231126)**.** It is a bonafide piece of work, carried out under the guidance in **Department of CSE-IoT**, **Lakshmi Narain College of Technology, Bhopal** for the partial fulfillment of the **Bachelor of Technology** during the academic year 2025-2026.

**Guide By** **Approved By**

**Dr. Subodhini Gupta** **Dr. Vivek Richhariya**

**Professor** **Professor & Head**

LAKSHMI NARAIN COLLEGE OF TECHNOLOGY, BHOPAL

**DEPARTMENT OF CSE-IoT**


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Meghna Tiwari [0103IS231109] Nishtha Mehrotra [0103IS231121]

Riddhima Jain [0103IS231151] Pari Shivhare [0103IS231126]

# INDEX

# CHAPTER 1

# Problem Domain Description

## Introduction

Digital notetaking has become an essential activity for students, developers, researchers, and professionals. With the shift towards cloud-based learning, online study resources, and distributed project teams, users require a fast, lightweight, and distraction-free platform to create, organize, and store notes. Traditional handwritten notes lack accessibility and searching capability, while large software tools often introduce unnecessary complexity.

Markdown, a portable lightweight markup language, has become a preferred solution for structured notetaking because it supports formatting, headings, checklists, code blocks, and documentation-style writing. However, many existing markdown editors are either paid, require heavy installation, or do not offer a clean and simple interface suitable for academic and project documentation.

To address this issue, the project Markdown Notes provides a web-based platform where users can create, edit, preview, and manage notes using markdown syntax in real time. It is designed to help students maintain well-formatted study material and documentation without learning complex tools.

## 1.1 Problem Background

Students and developers often struggle with the following challenges:

- Keeping notes organized across different devices
- Maintaining formatted notes using plain text editors
- Lack of real-time preview for formatted text
- Difficulty preparing documentation for projects, reports, and research

- No lightweight, minimal-UI note editor that works in the browser
- Switching between multiple platforms to preview markdown

Large tools like MS Word, Notion, or Google Docs can feel heavy and slow, while advanced tools like VS Code or Obsidian require installation and technical knowledge.

Therefore, there is a need for a simple, fast, online markdown editor that works directly from the browser requires no installation and allows expressive notetaking.

## 1.2 Identified Problem

Users need a minimal, fast, web-based markdown editor that:

- Requires no installation
- Works directly in the browser
- Supports markdown formatting
- Offers instant preview
- Helps students create structured academic notes
- Can be used for project documentation

The lack of such a tool leads to unorganized notes, inconsistent formatting, and reduced productivity.

## 1.3 Proposed Solution — Markdown Notes Web App

The proposed solution is a web-based Markdown Notes application built using:

- Vite + JavaScript — fast frontend builds tools
- Tailwind CSS — responsive and clean UI
- React/Vanilla JS (depending on repo) rendering and state handling

Key Features:

- Real-time markdown-to-HTML preview
- Split-screen editor and preview
- Clean, minimal, distraction-free UI
- Markdown support for headings, lists, tables, code, and formatting
- Easy to extend, customize, and deploy

## 1.4 Target Users

- Students preparing notes or project documentation
- Developers writing README files
- Researchers writing structured reports
- Anyone needing lightweight online notetaking
- Users working on Markdown-based documentation

## 1.5 Impact of the System

The Markdown Notes Web App helps users:

- Improve note organization
- Prepare formatted content without heavy tools
- Increase productivity with real-time preview
- Easily create documentation for academic or project reports
- Access markdown capabilities without installation
- Focus on content rather than UI complexity

# CHAPTER 2

# LITERATURE SURVEY

## 2.1 Introduction

A literature survey provides a detailed study of the tools, technologies, and research concepts related to the development of the Markdown Notes web application. Since the project focuses on lightweight digital notetaking, markdown processing, and browser-based content editing, it is important to understand how similar systems work, how markdown became popular, and what limitations still exist in current tools. This chapter reviews existing platforms, web technologies, and academic research to justify the need for the proposed system.

## 2.2 Background of Digital Notetaking

The shift from handwritten notes to digital notetaking has grown rapidly due to increased use of laptops, cloud platforms, and online education. Students and professionals now prefer tools that allow quick organization, editing, and searchability. Traditional text editors offer simplicity but lack formatting features. On the other hand, heavy applications provide features but are slow or complex.

Markdown, created by John Gruber in 2004, was introduced as a lightweight markup language that is easy to write and read even in plain text form. It quickly became popular for documentation, study notes, and content writing because it enables formatting with minimal syntax. Many technical communities, software repositories, and content management systems actively use markdown because of its simplicity and portability.

## 2.3 Existing Markdown Tools and Their Limitations

Several software tools offer markdown editing features, but each has limitations that prevent them from being ideal for simple academic note-making.

- Notion

  It is a popular cloud-based workspace that supports markdown-like formatting. However, it often feels heavy, loads slowly on low-end devices, and requires internet connectivity and user login, which makes it less suitable for quick notetaking.

- Obsidian

  It is a powerful markdown editor designed for personal knowledge management. It offers many plugins and advanced features, but beginners often find its interface complex. It also requires installation, which reduces accessibility.

- VS Code

  It provides excellent markdown preview and is widely used by developers, but it is not designed for students or non-technical users who simply want to write notes easily. Its interface may feel overwhelming, and it also requires installation.

- StackEdit

  It is a browser-based markdown editor, but it contains many configurable options that can distract new users instead of helping them write quickly.

- Google Docs

  It is a popular for cloud-based writing but does not support markdown at all and is not suitable for technical notes requiring formatted code blocks or structured documentation.

Across all the above tools, the main problems include heaviness, complexity, installation requirements, and lack of a clean, distraction-free interface.

## 2.4 Research on Markdown Processing and Web Technologies

- Markdown's popularity has encouraged the development of several rendering engines and web technologies. Research shows that markdown is preferred because it keeps content readable during writing and produces clean HTML when rendered.

- Client-side libraries such as Marked.js, Showdown.js, and Remark make it possible to convert markdown to formatted HTML in the browser without needing a backend server. These libraries allow real-time preview, fast rendering, and easy integration with JavaScript applications.

- Modern frontend technologies like Vite and React help create fast-loading applications with smooth user interactions. Vite is known for its extremely fast development server and efficient build system, making it suitable for lightweight applications such as a markdown editor.

- Tailwind CSS has also become popular in modern UI development. Research highlights that its utility-first design approach reduces CSS complexity, speeds up interface creation, and keeps layouts consistent and responsive. This supports the design of clean and minimal interfaces for productivity tools**.**

## 2.5 User Interface Research for Productivity Tools

Studies on digital productivity tools emphasize that users prefer interfaces that are clean, minimal, and distraction-free. Note-making tools should allow users to focus on writing content rather than navigating through menus or features. Split-screen design, instant preview, limited controls, and smooth typing experiences contribute significantly to productivity.

Most heavy or complex applications fail to maintain this simplicity. Students and beginners often need straightforward tools where the emphasis is entirely on content creation. A

browser-based editor requires no installation and allows users to start writing immediately, making it more accessible than desktop applications.

## 2.6 Gap Analysis

The literature review shows several gaps in existing systems. Many markdown editors are either too advanced or too heavy for simple notetaking. Others require installation, which reduces convenience for students. Several tools lack real-time preview, while some provide too many features that can overwhelm new users.

There is a clear need for a lightweight, browser-based markdown editor that focuses on speed, simplicity, and real-time formatting. The proposed Markdown Notes application fills this gap by offering a fast, easy-to-use interface built using modern web technologies, without unnecessary complexity.

# CHAPTER 3

# MAJOR OBJECTIVE & SCOPE OF THE PROJECT

## 3.1 Introduction

This chapter describes the overall purpose, objectives, and scope of the Markdown Notes web application. Every technical project begins with a clear set of goals that guide its design, development, and implementation. The Markdown Notes application is designed as a lightweight, browser-based tool to help users create structured notes using markdown syntax and preview them instantly. The main focus of this chapter is to define what the system intends to achieve and the boundaries within which it will operate.

## 3.2 Major Objective of the Project

The primary objective of the Markdown Notes project is to create a simple, fast, and user-friendly online markdown editor that allows users to write and preview notes in real time. The project aims to provide an accessible platform that does not require installation, heavy resources, or complex workflows.

More specifically, the major objective is:

To develop a web-based note-taking system that supports markdown syntax, provides instant preview, and offers a distraction-free writing interface using modern web technologies such as JavaScript, Vite, and Tailwind CSS.

This objective emphasizes user convenience, performance, simplicity, and compatibility with standard web browsers**.**

## 3.3 Specific Objectives

To achieve its major aim, the project includes several specific objectives:

- Provide a markdown-supported writing environment

  The system should allow users to write structured notes using headings, lists, bold and italic text, code blocks, links, and other markdown elements.

- Enable real-time preview of formatted content

  Users should instantly see how their markdown text appears in rendered HTML format without manual actions like exporting or previewing in a separate window, offering a clean, minimalistic, distraction-free interface. The application should eliminate unnecessary features and focus entirely on smooth writing and readability.

- Ensure fast performance using lightweight technologies

  By utilizing Vite for optimized build processes and Tailwind CSS for responsive design, the system should load quickly and respond smoothly to user input.

- Maintain high accessibility and ease of use

  The tool should work on any modern browser without requiring installation, account creation, or complex setup.

- Support both academic and technical notetaking

  The editor should be suitable for students writing notes as well as developers preparing documentation.

## 3.4 Scope of the Project

The Markdown Notes application is designed as a prototype focusing on essential features required for effective markdown-based notetaking.

### 3.4.1 In-Scope Features

- Web-Based Platform:

  The system runs entirely in a browser and does not require installation or external dependencies.

- Markdown Editing Panel:

  The editor allows users to type text using markdown syntax.

- Real-Time Preview Panel:

  The content is converted to formatted HTML instantly and displayed next to the editor.

- Basic Formatting Support:

  This includes headings, lists, emphasis, code blocks, blockquotes, links, and inline formatting.

- Lightweight Performance:

  Vite ensures fast loading, smooth transitions, and quick rendering of markdown changes.

## 3.5 Expected Outcomes

The project is expected to deliver a fully functioning browser-based markdown editor with the following outcomes:

- Users can write notes using markdown syntax easily
- The interface allows live preview of formatted content
- The system operates smoothly and loads quickly
- Students gain a simple tool for academic note creation
- Developers can use it for writing documentation
- The application demonstrates a clean and modern UI design
- The project can serve as a base for advanced documentation systems

## 3.6 Benefits of the System

The Markdown Notes application offers several benefits:

- Accessibility
  Works directly in the browser without installation

- Simplicity
  A minimal interface makes it easy for students and beginners.

- Productivity
  Real-time preview reduces mistakes and improves writing flow.

- Lightweight Performance
  The technologies used ensure fast processing and smooth interaction.

- Versatility
  Useful for students, developers, and professionals.

# CHAPTER 4

# PROBLEM ANALYSIS AND REQUIREMENT SPECIFICATION

## 4.1 Introduction

Before designing and developing any software system, it is necessary to understand the problem in depth and identify what is required to solve it effectively. This chapter presents the detailed analysis of the challenges users face in digital notetaking and describes the functional and non-functional requirements of the Markdown Notes application. The purpose of this chapter is to clearly define how the system will behave, what components it will include, and what constraints or expectations it must fulfill.

## 4.2 Problem Analysis

Modern students, professionals, and developers rely heavily on digital platforms for writing notes, preparing documentation, and organizing information. However, most available tools fall into two extremes: either they are too simple with no formatting capabilities, or they are too heavy with unnecessary features and complicated interfaces.

Users often face the following problems:

- Difficulty organizing academic notes efficiently

  Traditional text editors allow typing but do not support structured formatting such as headings, emphasis, lists, or code formatting in a simple way. This makes academic content less organized and harder to review.

- Lack of minimal, distraction-free tools

  Many writing tools include multiple menus, toolbars, and features. These can overwhelm users, especially when they want a clean environment focused solely on writing.

- No instant preview of formatted content

  Markdown is easy to write, but new users struggle to visualize how their text will look once formatted. Switching between different windows or pressing preview buttons slows the process.

- Requirement of installation or login

  Applications like Obsidian, VS Code, and Notion require installation or account creation. This reduces accessibility for users who just want to quickly write notes on any device.

- Performance issues in heavy tools

  Many advanced note-taking applications consume high memory and processing power, especially on low-end laptops. This affects responsiveness and productivity.

- Lack of lightweight online editors designed for students

  Students often prefer quick and simple tools but still require organized formatting for projects, assignments, and documentation.

After analyzing these challenges, the need for a lightweight, instantly accessible, browser-based markdown editor becomes clear**.**

## 4.3 System Overview

The Markdown Notes application is a web-based platform that provides two main components:

- A markdown editor panel, where users type their notes using markdown syntax.

- A real-time preview panel, where the formatted output is displayed immediately.

The system uses JavaScript for logic, Tailwind CSS for styling, and Vite for fast rendering. Since the application is completely browser-based, users do not need to install software or

create an account. The system serves as a minimal and efficient environment for writing structured notes.

## 4.4 Functional Requirements

Functional requirements describe what the system should do. The Markdown Notes application includes the following:

- Markdown Editing Feature

  The system must allow users to type notes using markdown syntax. This includes headings, lists, bold and italic text, hyperlinks, code blocks, and other markdown-supported formatting options.

- Real-Time Preview

  As users type in the editor, the system must instantly convert the markdown text into HTML and display it in the preview section without requiring any manual refresh or additional action.

- Basic Navigation and Interaction

  Users should be able to clear the editor, type freely, and scroll between panels. The system should support smooth text input without lag.

- Simple Startup

  Users should be able to load the application by simply opening it in a browser. No installation, registration, or external dependencies should be required.

## 4.5 Non-Functional Requirements

Non-functional requirements define the quality characteristics and constraints of the system.:

- **P**erformance

  The system must load quickly and respond instantly to user input. Vite and lightweight JavaScript help ensure high performance and minimal latency.

- Usability

  The interface must be user-friendly, distraction-free, and suitable for both beginners and experienced users. The editor should be easy to understand without any learning curve.

- Reliability

  The system should perform consistently without crashing, lagging, or losing user input during typing sessions. Preview updates must be accurate and immediate.

  As users type in the editor, the system must instantly convert the markdown text into HTML and display it in the preview section without requiring any manual refresh or additional action.

- Portability

  Since the system is browser-based, it should run smoothly on Chrome, Firefox, Edge, and other modern browsers across Windows, macOS devices.

- Maintainability

  The code should be modular and easy to maintain. Using Vite and Tailwind simplifies project structure, making future updates easier.

- Security

  Although there is no login or database component in this version, the application should not expose any unsafe scripts or vulnerabilities through the markdown parser**.**

## 4.6 Constraints and Assumptions

Every software has certain constraints and underlying assumptions. For this project:

### Constraints

- The editor cannot save data permanently because there is no backend database.
- The markdown preview depends on client-side rendering libraries.
- The system runs only on modern browsers that support ES modules and CSS utilities.

### Assumptions

- Users have basic knowledge of typing markdown or are willing to learn simple syntax.
- Users always have access to at least one modern web browser.
- Internet connectivity is needed only to open the platform (if deployed online).

# CHAPTER 5

# DETAILED DESIGN (MODELING AND ERD/DFD)

## 5.1 Introduction

Detailed design is an essential stage of software development where the system's internal structure, data flow, user interaction, and processing logic are clearly defined. Even though the Markdown Notes application is lightweight and does not include a backend database, it still follows an organized internal architecture. This chapter explains the conceptual design models, data flow, and structural layout used to build the application.

The system design ensures that the application is modular, easy to maintain, responsive, and functions smoothly across different devices and browsers.

## 5.2 System Architecture

The Markdown Notes application follows client-side architecture, meaning all processing happens within the web browser. There is no backend server, no database, and no login mechanism in this version. The browser handles rendering, previewing, and UI updates.

The architecture contains three logical layers:

1. Presentation Layer

   This includes the graphical user interface that displays the editor, preview panel, buttons (if any), and the overall layout. Tailwind CSS is used to structure and style the UI, ensuring responsiveness and visual clarity.

2. Application Logic Layer

   This consists of JavaScript code that listens to user input, interprets changes, and triggers markdown conversion. It also updates the preview panel after every keypress.

3. Markdown Rendering Layer

This layer uses a markdown parsing library (such as Marked.js or another JS-based renderer) to convert markdown text into HTML output in real time.

## 5.3 Module Design

The system is divided into simple modules to improve maintainability and clarity.

### 5.3.1 Editor Module

This module is responsible for collecting user input. It manages:

- Keystrokes
- Typing interactions
- Scroll positions
- Text updates

Its main role is to provide a typing interface that feels intuitive and responsive.

### 5.3.2 Preview Module

This module listens to updates from the Editor module. Whenever the user types something:

- The text is sent to the markdown renderer
- The renderer converts it to HTML.
- The new preview is displayed instantly.

This creates the real-time preview effect that is central to the application.

### 5.3.3 Markdown Rendering Module

This is the core processing unit of the application. It:

- Interprets markdown syntax,
- Apply formatting rules
- Generates safe and clean HTML from user input

This module ensures that content is always correctly displayed.

### 5.3.4 UI and Layout Module

- This module defines the structure of the split-screen layout (editor on one side, preview on the other).
- Tailwind CSS helps keep the layout clean and responsive.
- Also, it adjusts spacing, fonts, and color themes.

### 5.3.5 Event Handling Module

This component listens for changes in the editor. Every keystroke triggers functions that update the preview. It ensures:

- Smooth interaction
- Responsive updates
- No delay in rendering

## 5.4 Data Flow Description (DFD)

### 5.4.1 DFD Level 0 — The Overall Flow

At the highest level, the user enters markdown text, and the system produces a formatted HTML preview. The steps involved are:

- User types of markdown text
- Editor module captures the input
- Markdown rendering module processes the text
- Preview module displays formatted content

### 5.4.2 DFD Level 1 — Detailed Flow Explanation

The detailed flow of operations inside the system can be described as follows:

**Step 1:**

User Input

The user interacts with the editor panel by typing plain text using markdown syntax. The application continuously monitors these inputs.

**Step 2:**

Event Trigger

Each time the user types a character, deletes text, or updates content, a JavaScript event is triggered. This event signals the system that the text has changed.

**Step 3:**

Processing Markdown

The updated text is immediately passed to the markdown renderer. The renderer interprets markdown symbols (such as #, *, -, `) and converts them into corresponding HTML tags.

**Step 4:**

Generating Output

The renderer produces HTML content, which is clean, structured, and styled according to Tailwind CSS.

**Step 5:**

Displaying the Preview

The preview module updates the preview panel with the latest rendered HTML. This ensures that the user always sees an accurate, formatted version of their notes.

## 5.5 Logical Design of Components

The logical structure of the system can be explained through interactions:

- User → Editor

  The user types of content. The editor receives and stores the text temporarily.

- Editor → Renderer

  The editor sends the current text to the markdown rendering logic.

- Renderer → Preview Panel

  The renderer returns formatted HTML, and the preview panel displays it.

- Preview Panel → User

The user visually interprets the formatted content and continues writing accordingly.

This interaction cycle repeats continuously, creating a smooth and uninterrupted writing workflow.

## 5.6 User Interface Design

The user interface is intentionally minimal to avoid visual clutter.

### 5.6.1 Editor Panel

This is a plain text area where the user writes notes. It is designed to feel spacious and comfortable for long writing sessions.

### 5.6.2 Preview Panel

This panel displays the rendered markdown. It replicates how the final content will look, helping users immediately understand how formatting appears.

# CHAPTER 6

# HARDWARE/SOFTWARE PLATFORM ENVIRONMENT

## Introduction

This chapter discusses the hardware and software environment required to develop, deploy, and run the Markdown Notes web application. Although the project is lightweight, a proper development environment ensures efficient coding, smooth performance, and reliable execution. The system is built using modern web technologies that support fast rendering, responsive design, and accessible usage. This chapter outlines the tools, frameworks, and system requirements needed for the project.

## 6.1 Hardware Environment

The Markdown Notes application is a purely client-side system and does not require heavy processing power. It can run smoothly on most modern devices, including laptops, desktops, . The hardware requirements listed below refer to the development machine used to build the project, although the actual user devices can be less powerful since the browser handles all the processing.

### 6.1.1 Minimum Hardware Requirements

- A processor capable of running a modern operating system and web browser
- At least 4 GB of RAM
- Basic display resolution to support split-screen view
- Sufficient storage to install Node.js, Vite, and other development tools

### 6.1.2 Recommended Hardware Requirements

- A multi-core processor for faster development builds
- 8 GB RAM or higher to support smooth development environment
- Full HD display for comfortable code editing and previewing
- A stable internet connection for accessing documentation and dependencies

The final deployed application, however, needs no installation and can run on any device with a web browser.

## 6.2 Software Environment

The project uses a modern and flexible software environment focused on web-based development. The following components form the core of the system.

### 6.2.1 Operating System

Any operating system that supports a modern browser can be used, including:

- Windows
- macOS
- Linux

The development itself can be performed on any of these platforms without compatibility issues.

### 6.2.2 Browser Environment

The Markdown Notes application runs on modern web browsers such as:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Safari

Because the system is built using standard JavaScript, HTML, and CSS, it is highly compatible across platforms.

### 6.2.3 Development Tools

To develop the application, several software tools are used:

- Node.js

  Allows running JavaScript tools during development.

- Vite

  Provides a fast build environment and local development server with instant reload capability.

- Visual Studio Code

  Used as the primary code editor for writing HTML, CSS, and JavaScript.

- npm (Node Package Manager)

  Installs libraries and dependencies required by the application.

## 6.3 Technologies Used

The project is developed using the following core technologies:

- HTML5
  Defines the structure of the user interface.

- CSS (Tailwind CSS)
  Provides styling and layout management using utility-first classes.

- JavaScript
  Handles the application logic, event handling, and interaction between components.

- Markdown Rendering Library
  Convert markdown text into HTML for real- time preview.

- Vite Build Tool
  Ensures fast bundling, optimized builds, and smooth development workflow.

These technologies collectively produce a fast, lightweight, and responsive application**.**

## 6.4 Justification for the Chosen Platform

The selected platform components are chosen not only for efficiency but also for accessibility and ease of use. This section explains why each part of the environment was chosen.

### 6.4.1 Browser-Based Platform

The decision to make the system entirely browser-based eliminates installation requirements, making the tool instantly accessible. Users can simply open the application in a web browser and begin writing notes immediately.

### 6.4.2 Vite as the Development Tool

Vite is known for its extremely fast development server and quick build times. Compared to older tools like Webpack, Vite significantly reduces waiting time and improves developer productivity.

### 6.4.3 Tailwind CSS for Styling

Tailwind CSS is highly flexible and allows rapid UI development using utility classes. It ensures consistent spacing, responsive design, and clean appearance without the need for writing large custom CSS files.

### 6.4.4 JavaScript for Logic Handling

JavaScript is universally supported in browsers, making it the ideal choice for implementing interactive features such as real-time preview, DOM updates, and text handling.

### 6.4.5 Markdown Renderer Integration

Instead of building a markdown parser from scratch, integrating a proven markdown library ensures:

- Accuracy in rendering
- Faster development
- Stable performance

This allows developers to focus on UI and usability.

## 6.5 System Configuration and Setup

To run the project in a development environment, the following steps are used:

1. Install Node.js

Node.js allows running Vite and installing dependencies.

2. Clone the Project Repository

The GitHub repository is downloaded or cloned to begin development.

3. Install Dependencies

The command npm install is used to set up all required libraries.

4. Start the Development Server

Running npm run dev launches Vite's development server, enabling live preview and fast debugging.

5. Access the Application

The system runs in a browser at the provided localhost URL, where the editor and preview can be tested.

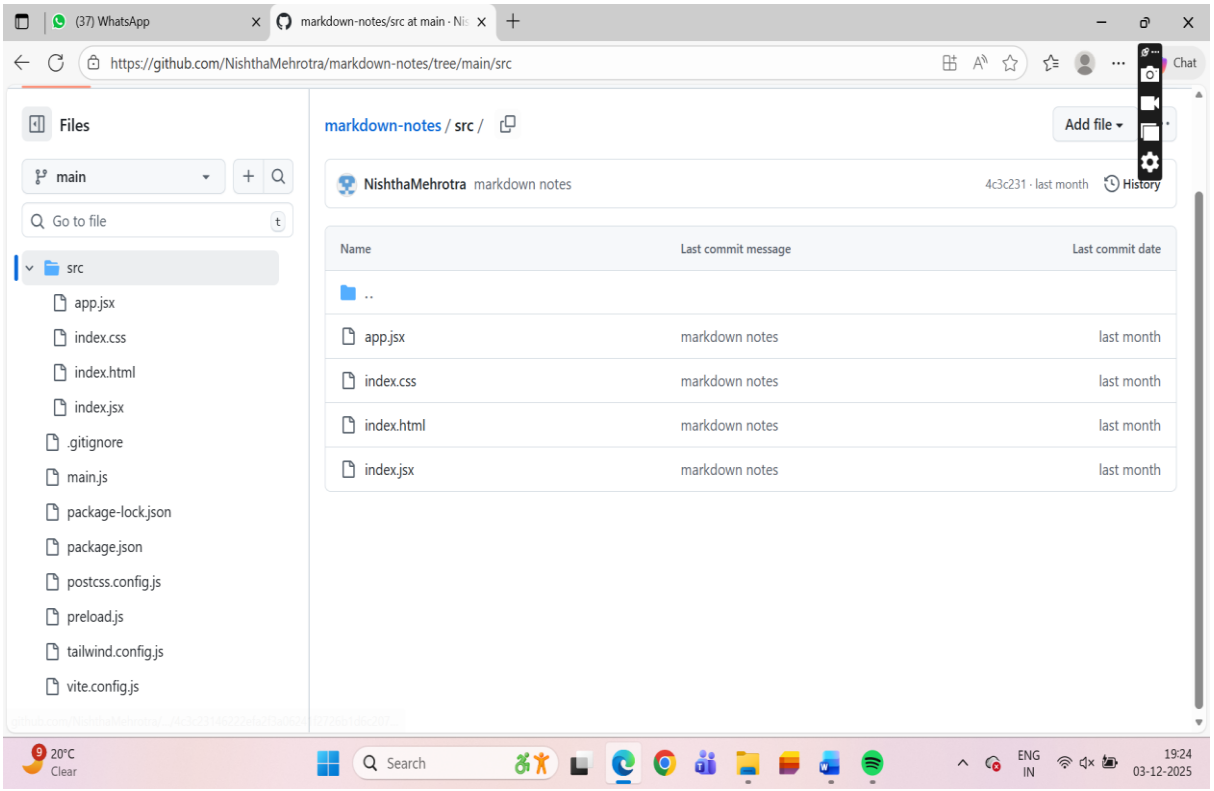
Once deployed, the system works directly in the browser without any special configuration.

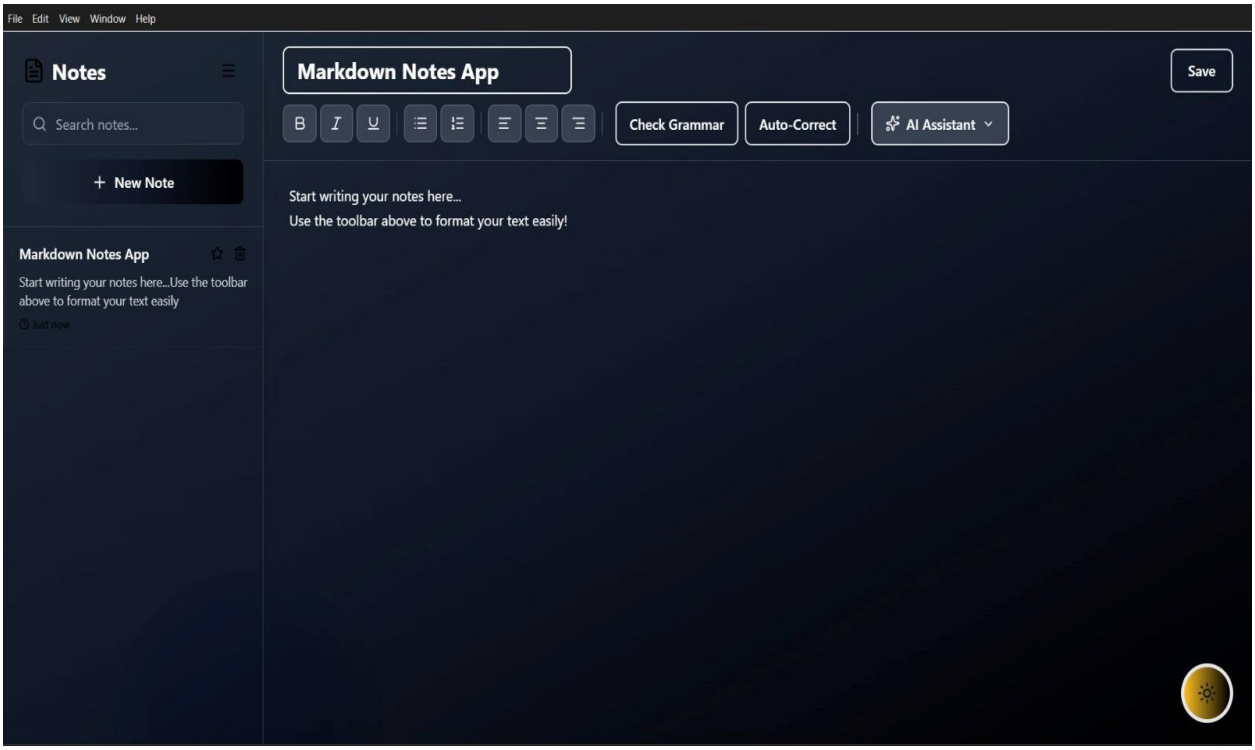
# CHAPTER 7

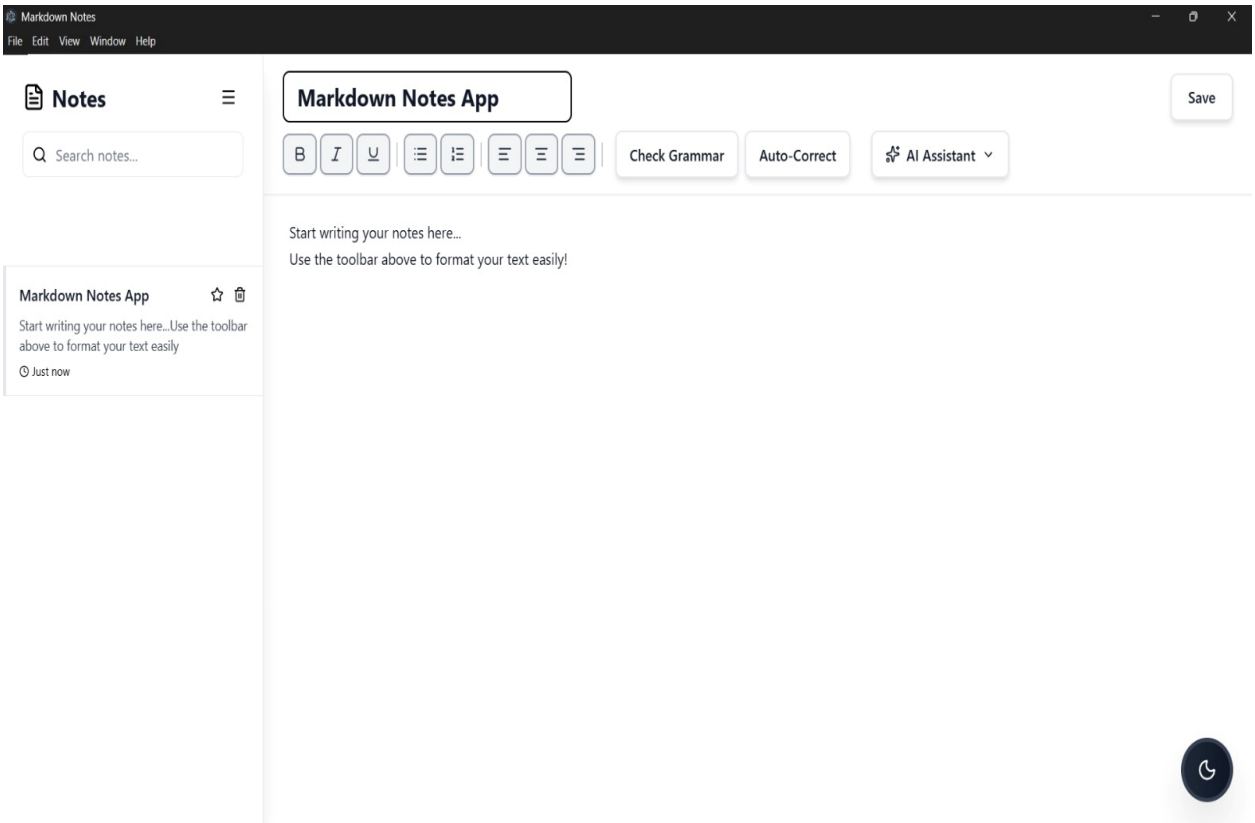
# SNAPSHOTS OF INPUT & OUTPUT

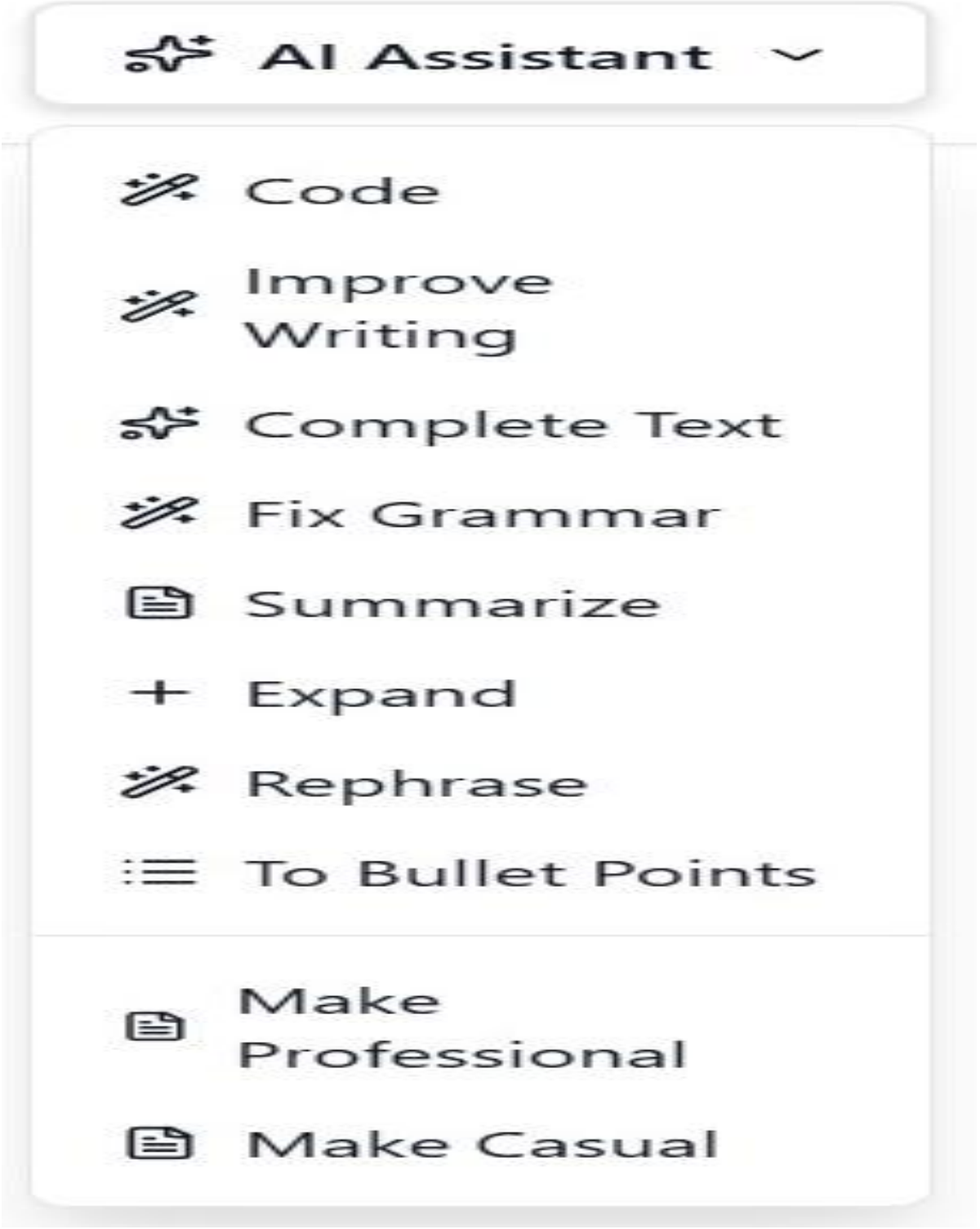
## 7.1 Introduction

Snapshots provide a visual understanding of how the Markdown Notes application looks and behaves during execution. Since the system is purely browser-based, all interactions occur through the web interface.




File Edit View Window Help
Notes
Search notes...
+ New Note
Markdown Notes App
Start writing your notes here...Use the toolbar above to format your text easily
Just now
Markdown Notes App
Save
Check Grammar
Auto-Correct
AI Assistant
Start writing your notes here...
Use the toolbar above to format your text easily!


Markdown Notes
File Edit View Window Help
Notes
Search notes...
Markdown Notes App
Start writing your notes here...Use the toolbar above to format your text easily
Just now
Markdown Notes App
Save
Check Grammar
Auto-Correct
AI Assistant
Start writing your notes here...
Use the toolbar above to format your text easily!


AI Assistant
Code
Improve Writing
Complete Text
Fix Grammar
Summarize
Expand
Rephrase
To Bullet Points
Make Professional
Make Casual

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# CHAPTER 8

# CODING

## 8.1 Introduction

This chapter presents the coding implementation of the Markdown Notes web application. The project is built using modern web technologies including HTML, CSS (Tailwind CSS), JavaScript, and Vite as the development framework. The code provided in this chapter represents the core components of the system, including the editor functionality, markdown rendering logic, user interface structure, and application initialization process.

The purpose of this chapter is to demonstrate how the system operates internally through well-structured and commented code.

## 8.2 Frontend Structure (index.html)

The index.html file defines the basic structure of the HTML document, including the editor and preview sections.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Markdown Notes</title>
  </head>
  <body>
    <div id="root"></div>
    <script type="module" src="/index.jsx"></script>
  </body>
</html>
```

## 8.3 Styling With Tailwind (style.css)

Tailwind CSS is used to create a clean and responsive design.

```
@tailwind base;

@tailwind components;

@tailwind utilities
```

## 8.4 JavaScript Logic (main.js)

This is the core logic of the application. It handles:

- Event listening
- Markdown conversion
- Real-time preview updates

```
import {marked } from "marked";
const editor = document.getElementById("editor");
const preview = document.getElementById("preview");

// Initialize preview with empty content
preview.innerHTML = "<p>Start typing markdown...</p>";

// Event listener for input changes
editor.addEventListener("input", () => {
  const text = editor.value;
  preview.innerHTML = marked(text);
});
```

## 8.5 Vite Configuration (vite.config.js)

```
import { defineConfig } from "vite";
import react from "@vitejs/plugin-react";
import path from "path";

export default defineConfig({
  plugins: [react()],
  root: "./src",
  build: {
    outDir: "../dist",
  },
  resolve: {
    alias: {
      "@": path.resolve(__dirname, "./src"),
    },
  },
});
```

# CHAPTER 9

# PROJECT LIMITATION AND FUTURE SCOPE

## 9.1 Introduction

Every software system, especially in its prototype stage, has certain limitations based on the technologies used, the development time available, and the goals defined at the beginning of the project. Understanding these limitations helps in planning future enhancements and improving the system. This chapter discusses the constraints of the Markdown Notes application in its current form and explores the potential features and improvements that can be added to the system in future versions.

## 9.2 Project Limitations

Although the Markdown Notes application performs efficiently as a lightweight browser-based tool, the current version has the following limitations:

1. No Permanent Storage of Notes

   The system does not include a backend server or database.

   Notes are not saved automatically and will be lost if the browser is closed or refreshed.

   Users cannot log in or maintain long-term saved notes in the current version.

2. No File Export Feature

   The prototype does not support exporting notes into formats such as:

   - PDF

- DOCX
- Markdown (.md) files

3. No Cloud Synchronization

The system does not allow users to sync their notes across multiple devices. Since there is no authentication system, notes cannot be stored in the cloud.

4. Limited Editing Tools

Because the project focuses on simplicity, advanced features such as:

- Text highlighting
- Table creation
- Markdown templates
- Image uploads are not included.

5. No Multi-User Collaboration

Modern note-taking platforms allow multiple users to edit the same document simultaneously.

The current version does not support collaboration or real-time sharing.

6. No Theme Customization

The interface currently uses a single theme.

There is no option for:

- Dark mode
- Font style selection
- Color customization.

7. Browser Dependency

The system depends on modern browser compatibility.

Older browsers that lack JavaScript ES6 support may not run the application smoothly.

8. No Security Filters for Malicious Markdown

Although markdown is generally safe, advanced sanitization techniques are not implemented to filter potentially harmful HTML embedded in markdown input.

## 9.3 Future Scope

Despite its limitations, the Markdown Notes application has considerable scope for enhancement. The project can grow into a fully featured online notetaking and documentation tool. Potential future improvements include:

1. Adding User Authentication and Cloud Storage Introducing Login functionality will allow users to

    - Save notes permanently
    - Access notes from multiple devices
    - Organize notes into folders or categories**.**

Cloud storage integration (e.g., Firebase, MongoDB, Supabase) will significantly improve usability.

2. Implementing Export and Import Features

Users will be able to export notes such as:

- PDF
- Word documents
- Markdown files
- HTML files

This will make the tool useful for academic submissions and documentation.

3. Introducing Dark Mode and Custom Themes

A modern UI with theme switching will enhance the reading and writing experience. Users could select font size, color palette, and layout according to preference.

4. Adding Local Storage Support

Even without backend storage, the editor can store notes temporarily in the browser using:

- Local Storage
- Indexed DB

5. Multi-User Collaboration

Real-time document sharing using WebSockets will allow multiple users to type together, like Google Docs.

This would greatly benefit teams, developers, and classrooms.

6. Image Upload and Embedding

Users can upload images or add image links directly inside their notes.

This would make the editor more suitable for documentation, reports, and tutorials.

7. Advanced Markdown Extensions

The system can support additional functionalities like:

- Mathematical formula rendering using MathJax
- Table creation
- Task lists
- Diagrams using Mermaid.js.

This would make the tool available offline and on-the-go.

8. AI-Assisted Note Suggestions and Formatting

AI integration could help users by:

- Summarizing long notes
- Automatically formatting markdown
- Generating structured headings
- Improving grammar and clarity.

# CHAPTER 10

# REFERENCES


1. John Gruber, “Markdown: A Text-to-HTML Conversion Tool,” 2004. Available: https://daringfireball.net/projects/markdown/
2. Markdown Guide, “Basic and Extended Markdown Syntax,” 2020. Available: https://www.markdownguide.org/
3. Marked.js Documentation, “Markdown Parser and Compiler for JavaScript,” GitHub Repository, 2023.
4. Mozilla Developer Network (MDN), “JavaScript Documentation,” 2023. Available: https://developer.mozilla.org/
5. Tailwind CSS Official Documentation, “Utility-First CSS Framework,” 2023. Available: https://tailwindcss.com/
6. Vite Documentation, “Next Generation Frontend Tooling,” 2023. Available: https://vitejs.dev/
7. W3C HTML5 Standard, “HTML and DOM Specifications,” 2021.
8. Research Article, “User Interface Design Principles for Productivity Tools,” International Journal of Computer Applications (IJCA), 2021.
9. Google Chrome Developers, “Web Rendering and Browser Performance Guides,” 2023.
10. GitHub Repository, Nishtha Mehrotra, “Markdown Notes,” 2024. Available: https://github.com/NishthaMehrotra/markdown-notes
11. Stack Overflow Developer Documentation, “JavaScript and Web Development Best Practices,” 2022.
12. ECMAScript Language Specification, “ECMAScript 6 Features,” 2015.