CLARA BUDDY

A Smart Personalized Study Assistance Web Application

Abstract

Clara Buddy is a web-based personalized study assistant designed to help students organize their subjects, syllabus, timelines, and study schedules effectively. The system collects user inputs such as subjects, syllabus coverage duration, and preferred study timings, and then evaluates whether the plan is feasible within the specified period. If not, the system suggests adjustments to help students stay motivated and improve productivity. The platform provides on boarding, dashboards, study session modules, quizzes, and progress tracking through logs and history. The system integrates generative AI (Gemini API) for interactive question generation, adaptive content delivery, and student engagement. This project aims to reduce academic stress and improve self-learning efficiency through structured planning and feedback.

1. Introduction

The increasing academic workload and lack of personalized assistance often make it difficult for students to plan and complete their studies on time. Clara Buddy bridges this gap by offering smart scheduling, syllabus breakdown, performance tracking, and interactive study content. The system ensures efficient learning based on available time and motivates students through insights and adjustments. The project integrates modern web technologies such as React, TypeScript, Vite, Firebase Authentication, SQL schema design, and AI-based question generation.

2. Problem Statement

Students often struggle with:

- Poor time management
- Improper syllabus planning
- Lack of motivation during self-study
- Difficulty tracking progress
- No personalized feedback or study guidance

Clara Buddy addresses these issues by providing structured study planning, syllabus feasibility validation, and interactive content generation.

3. Objectives

The main objectives of Clara Buddy are:

- To allow students to input their subjects, syllabus, and time constraints
- To validate whether the syllabus can be completed in the provided timeframe
- To generate personalized study schedules
- To integrate quizzes & study sessions for active learning
- To track user performance and historical progress
- To provide motivation and corrective suggestions
- To leverage AI for dynamic content & questions

4. Scope of the Project

The scope includes:

- Student study planning and time management
- Personalized study session delivery
- Live quiz practice and evaluation
- Confidence logging and performance tracking
- AI-based syllabus question generation
- Dashboard analytics

Out of scope:

- Complete LMS course delivery
- Live classes or instructor involvement
- Offline learning modules

5. System Requirements

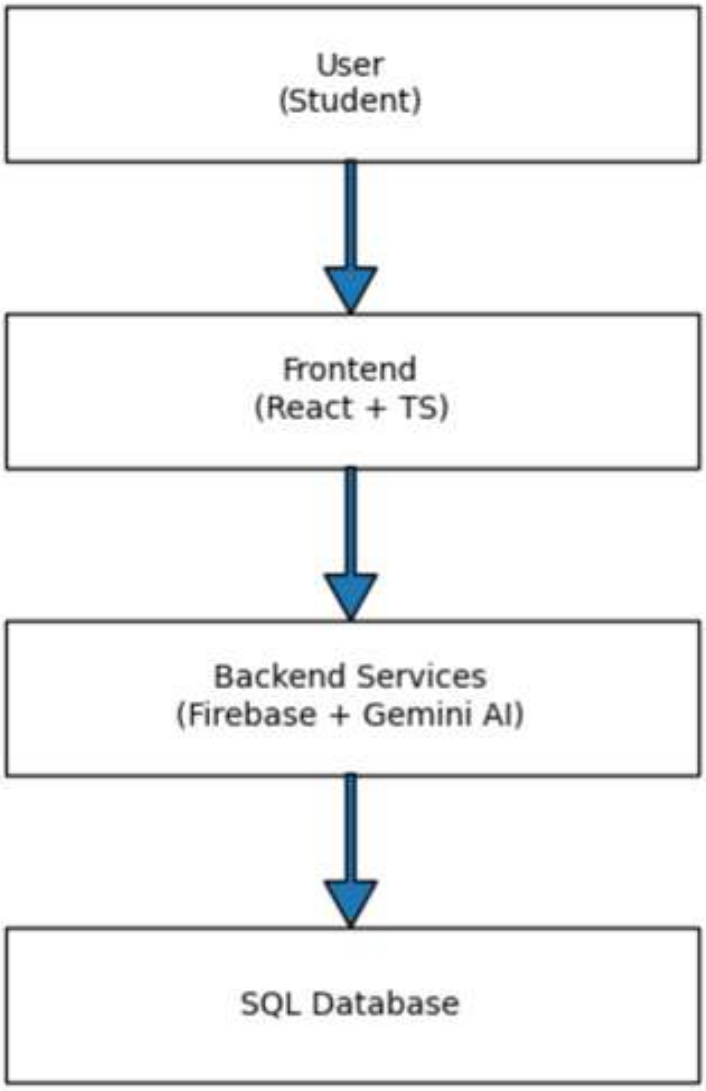
Hardware Requirements

- Processor: Intel Dual-Core or above
- RAM: Minimum 4GB
- Storage: Minimum 500MB free space

Software Requirements

- Operating System: Windows / Mac / Linux
- Web Browser: Chrome / Edge / Firefox
- Backend Services: Firebase / SQL DB
- Programming: Node.js, TypeScript
- Tools: Vite, React, Gemini API

6. System Architecture

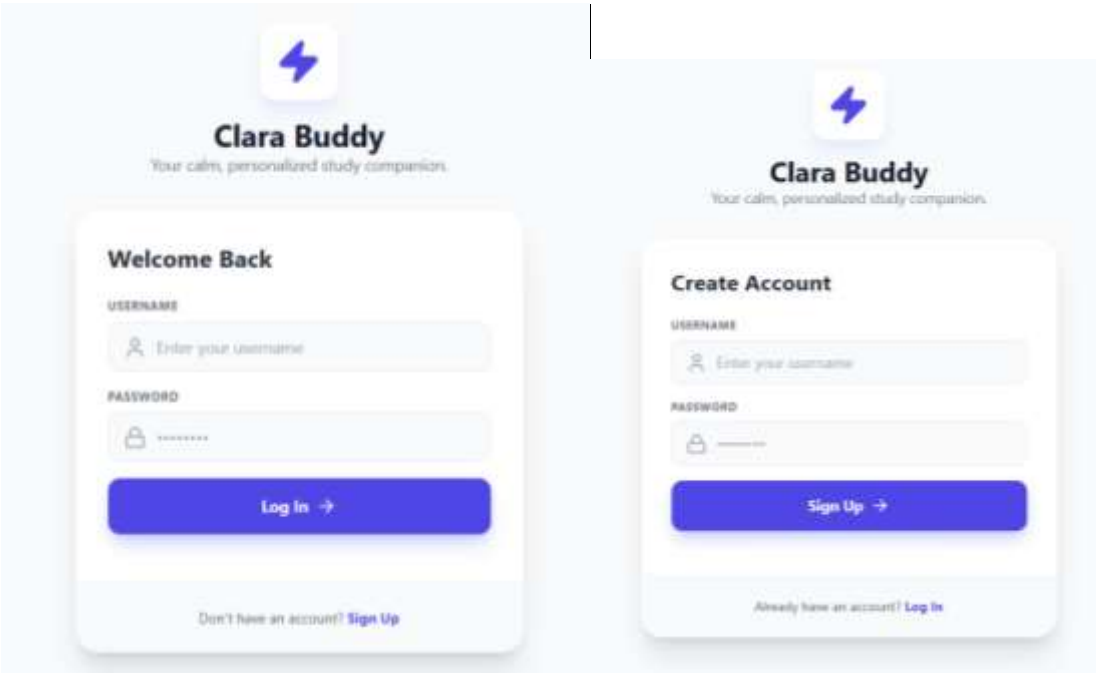


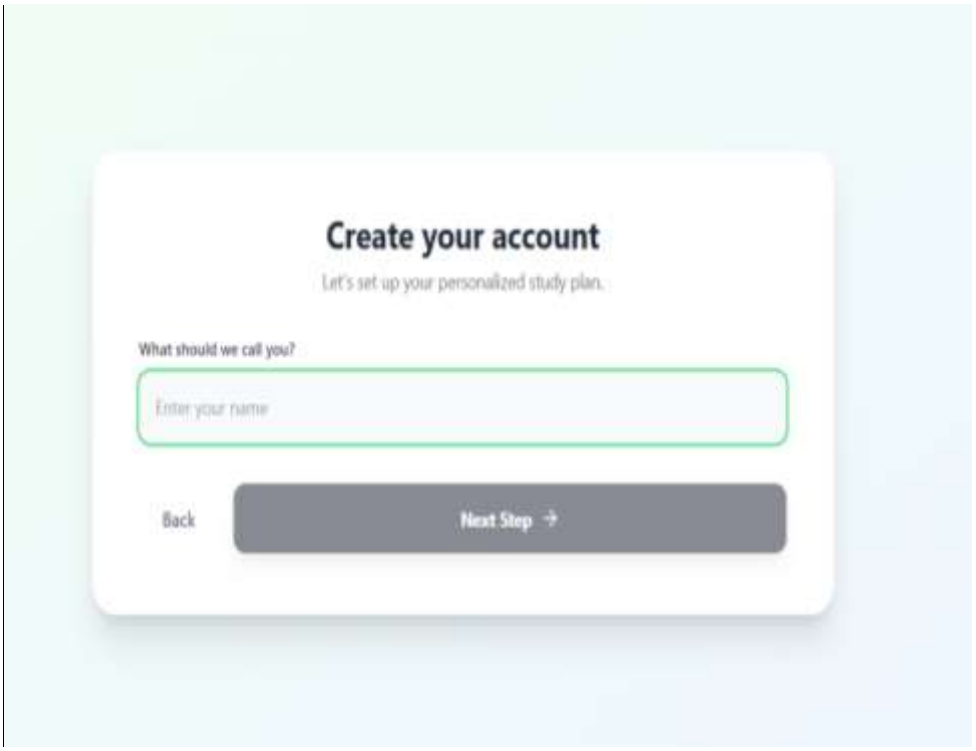
7. Database Design

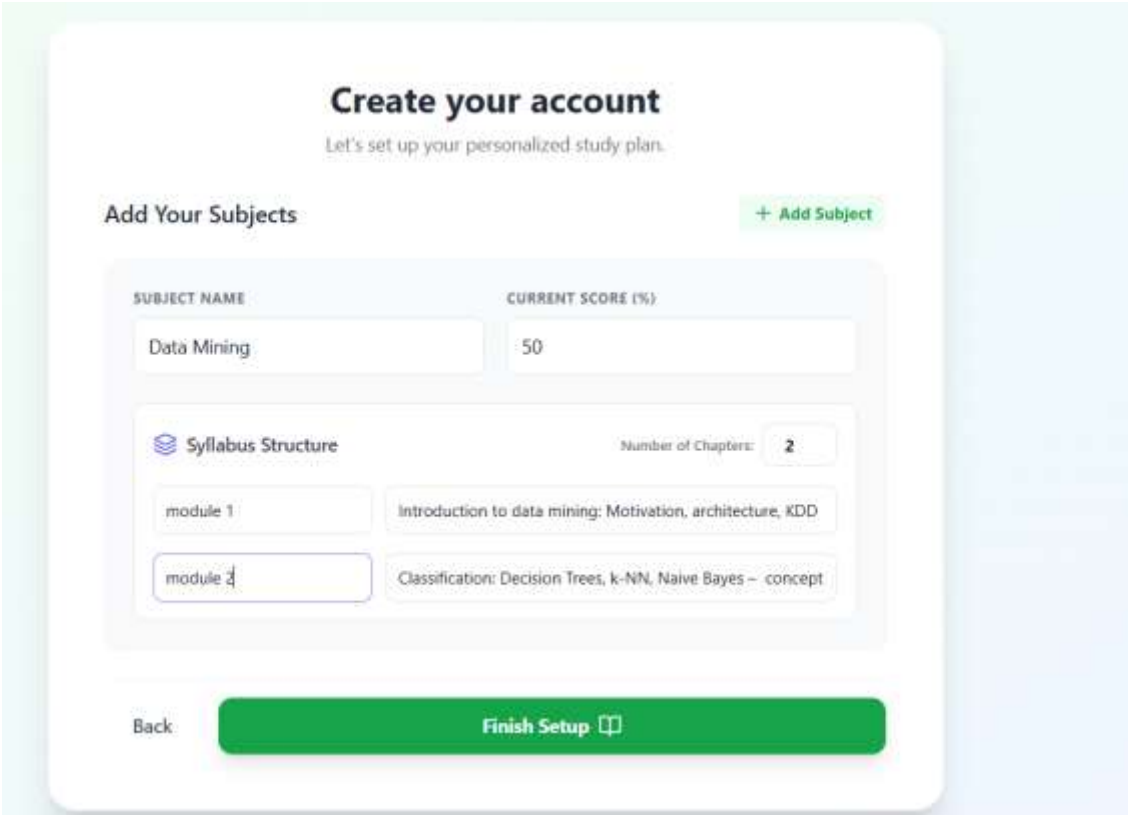
Schema reference from schema.sql includes essential tables such as:

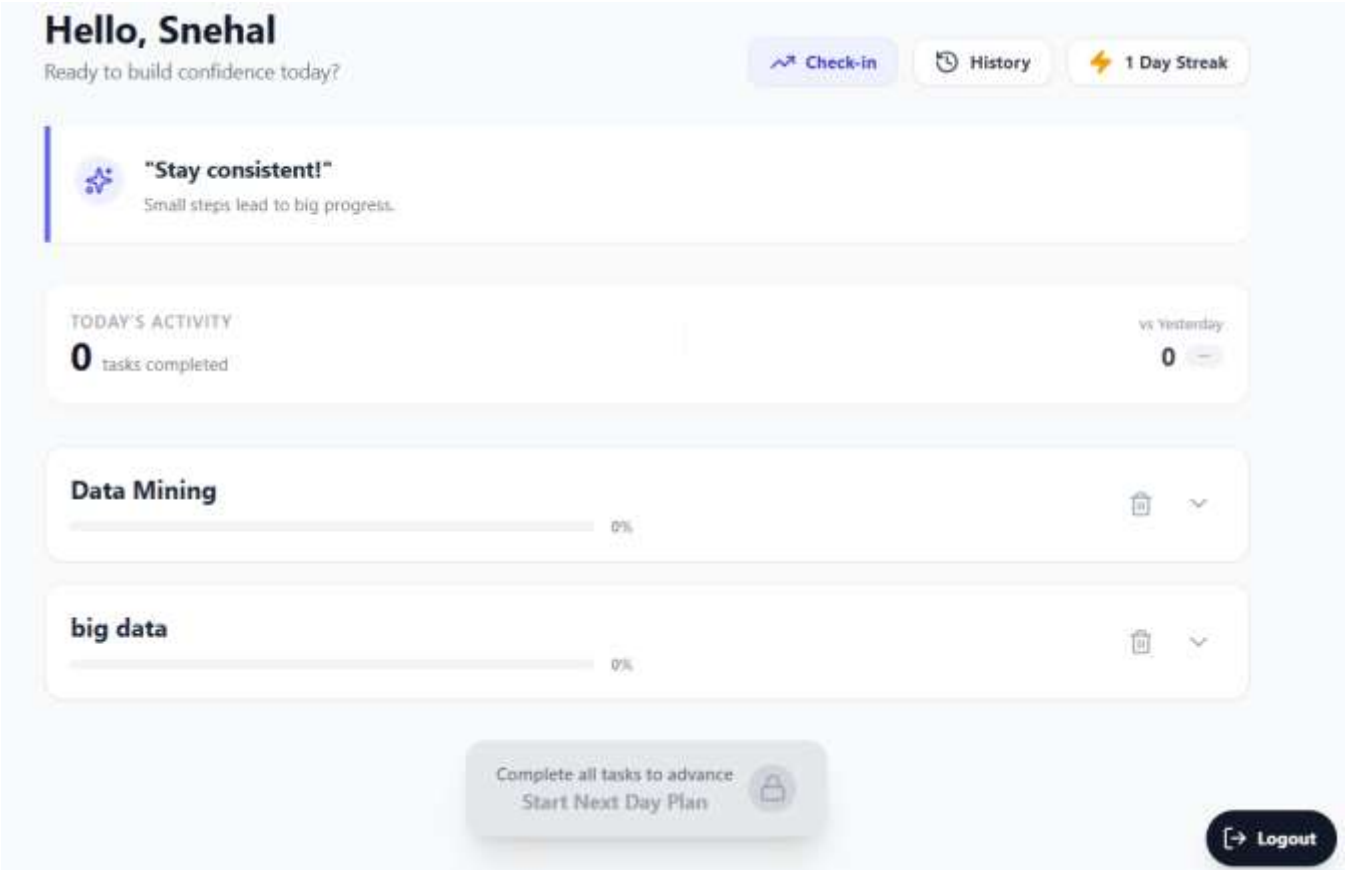
Table	Description
users	Stores user profile details
subjects	Stores subject info & syllabus
study_sessions	Logging each study session
quiz_history	Stores quiz results
confidence_logs	Tracks student confidence

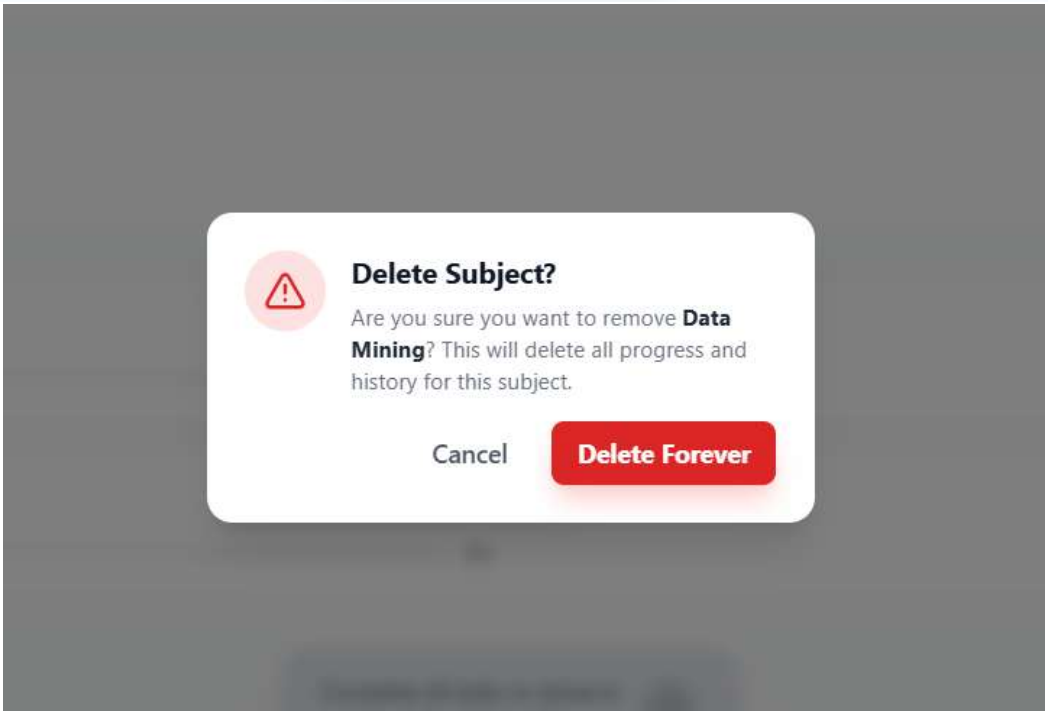
8 Screen Shots

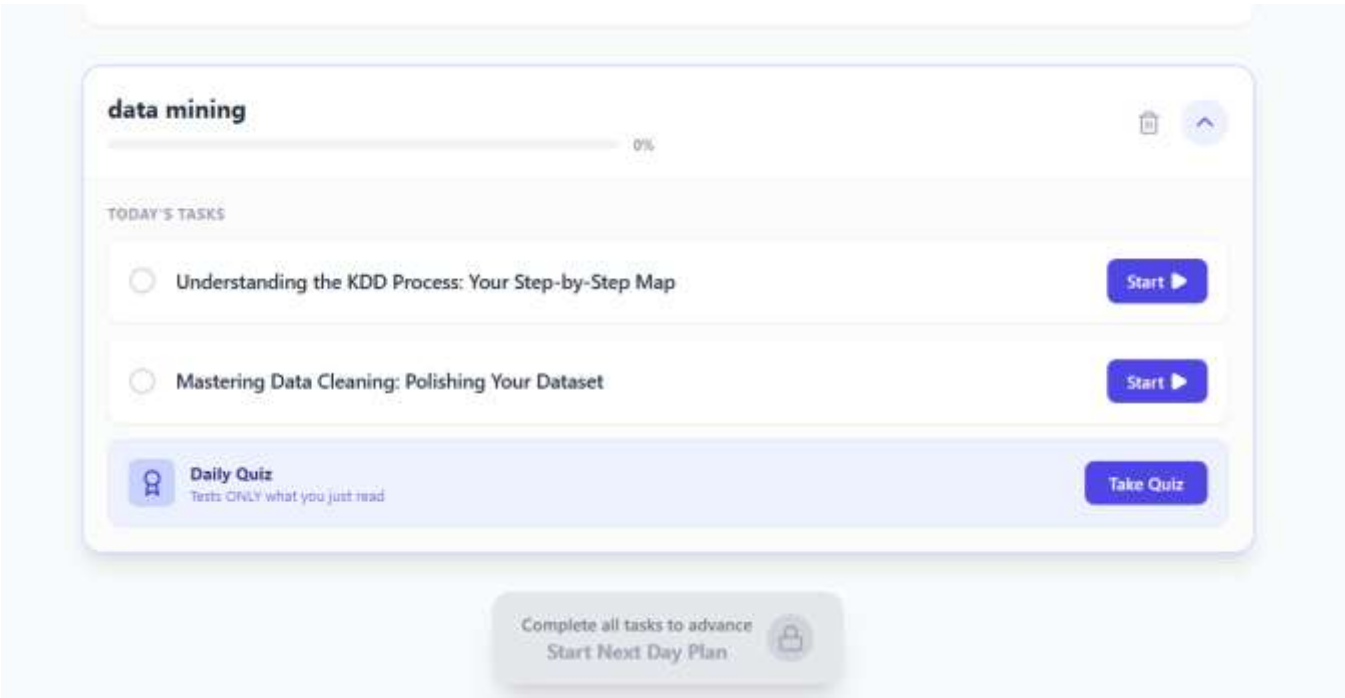


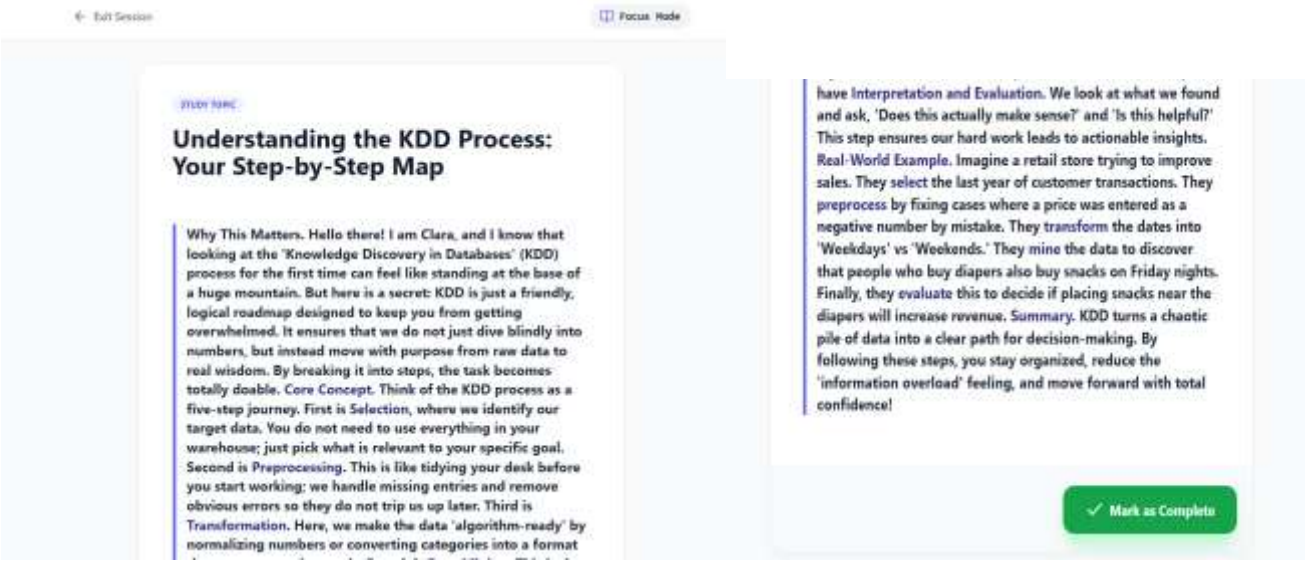

Create your account
Let's set up your personalized study plan.
What should we call you?
Enter your name
Back
Next Step →

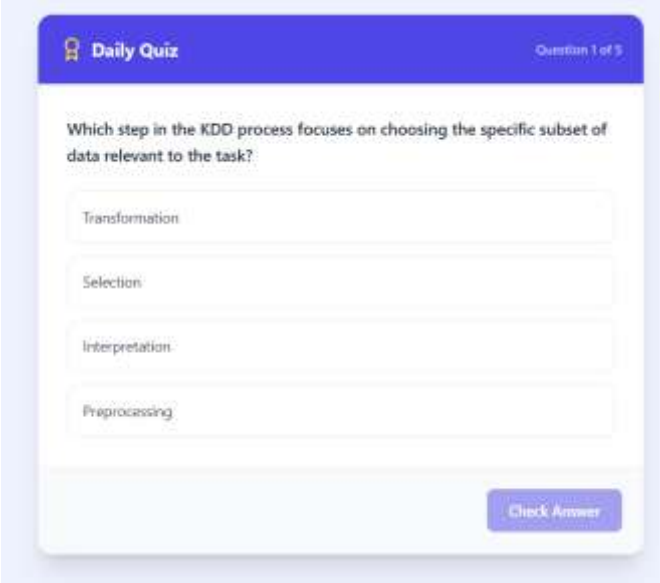

Create your account
Let's set up your personalized study plan.
Add Your Subjects
+ Add Subject
SUBJECT NAME
CURRENT SCORE (%)
Data Mining
50
Syllabus Structure
Number of Chapters: 2
module 1
Introduction to data mining: Motivation, architecture, KDD
module 2
Classification: Decision Trees, k-NN, Naive Bayes – concept
Back
Finish Setup

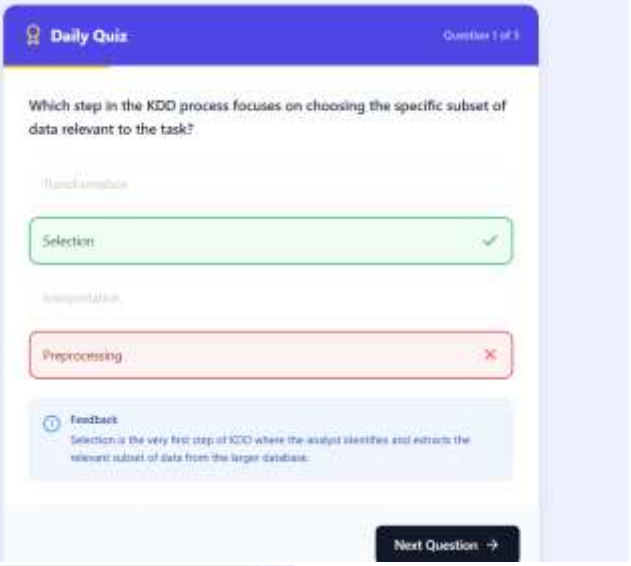

Hello, Snehal
Ready to build confidence today?
Check-in
History
1 Day Streak
"Stay consistent!"
Small steps lead to big progress.
TODAY'S ACTIVITY
0 tasks completed
vs Yesterday
0
Data Mining
0%
big data
0%
Complete all tasks to advance
Start Next Day Plan
Logout

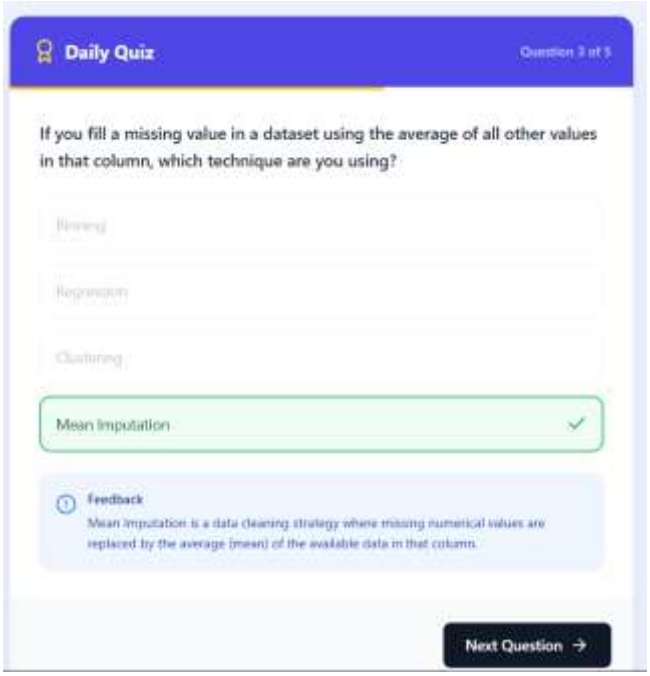

Delete Subject?
Are you sure you want to remove Data Mining? This will delete all progress and history for this subject.
Cancel
Delete Forever


data mining
0%
TODAY'S TASKS
Understanding the KDD Process: Your Step-by-Step Map
Start
Mastering Data Cleaning: Polishing Your Dataset
Start
Daily Quiz
Tests ONLY what you just read
Take Quiz
Complete all tasks to advance
Start Next Day Plan


Exit Session
Focus Mode
STUDY TOPIC
Understanding the KDD Process: Your Step-by-Step Map
Why This Matters. Hello there! I am Clara, and I know that looking at the 'Knowledge Discovery in Databases' (KDD) process for the first time can feel like standing at the base of a huge mountain. But here is a secret: KDD is just a friendly, logical roadmap designed to keep you from getting overwhelmed. It ensures that we do not just dive blindly into numbers, but instead move with purpose from raw data to real wisdom. By breaking it into steps, the task becomes totally doable. Core Concept. Think of the KDD process as a five-step journey. First is Selection, where we identify our target data. You do not need to use everything in your warehouse; just pick what is relevant to your specific goal. Second is Preprocessing. This is like tidying your desk before you start working; we handle missing entries and remove obvious errors so they do not trip us up later. Third is Transformation. Here, we make the data 'algorithm-ready' by normalizing numbers or converting categories into a format
have Interpretation and Evaluation. We look at what we found and ask, 'Does this actually make sense?' and 'Is this helpful?' This step ensures our hard work leads to actionable insights. Real-World Example. Imagine a retail store trying to improve sales. They select the last year of customer transactions. They preprocess by fixing cases where a price was entered as a negative number by mistake. They transform the dates into 'Weekdays' vs 'Weekends.' They mine the data to discover that people who buy diapers also buy snacks on Friday nights. Finally, they evaluate this to decide if placing snacks near the diapers will increase revenue. Summary. KDD turns a chaotic pile of data into a clear path for decision-making. By following these steps, you stay organized, reduce the 'information overload' feeling, and move forward with total confidence!
Mark as Complete


Daily Quiz
Question 1 of 5
Which step in the KDD process focuses on choosing the specific subset of data relevant to the task?
Transformation
Selection
Interpretation
Preprocessing
Check Answer


Daily Quiz
Question 1 of 5
Which step in the KDD process focuses on choosing the specific subset of data relevant to the task?
Selection
Preprocessing
Feedback
Next Question


Daily Quiz
Question 3 of 5
If you fill a missing value in a dataset using the average of all other values in that column, which technique are you using?
Mean Imputation
Feedback
Mean Imputation is a data cleaning strategy where missing numerical values are replaced by the average (mean) of the available data in that column.
Next Question

Your Journey

4
Study Sessions

2
Quizzes Taken

BIG DATA • Jan 11, 9:08 AM
Daily Knowledge Check
Score: 40%

DATA MINING • Jan 11, 9:08 AM
Daily Knowledge Check
Score: 20%

BIG DATA • Jan 11, 9:07 AM
Quick Revision
Completed

BIG DATA • Jan 11, 9:07 AM
Review: big data (Offline Mode)
Completed

Start Next Day Plan

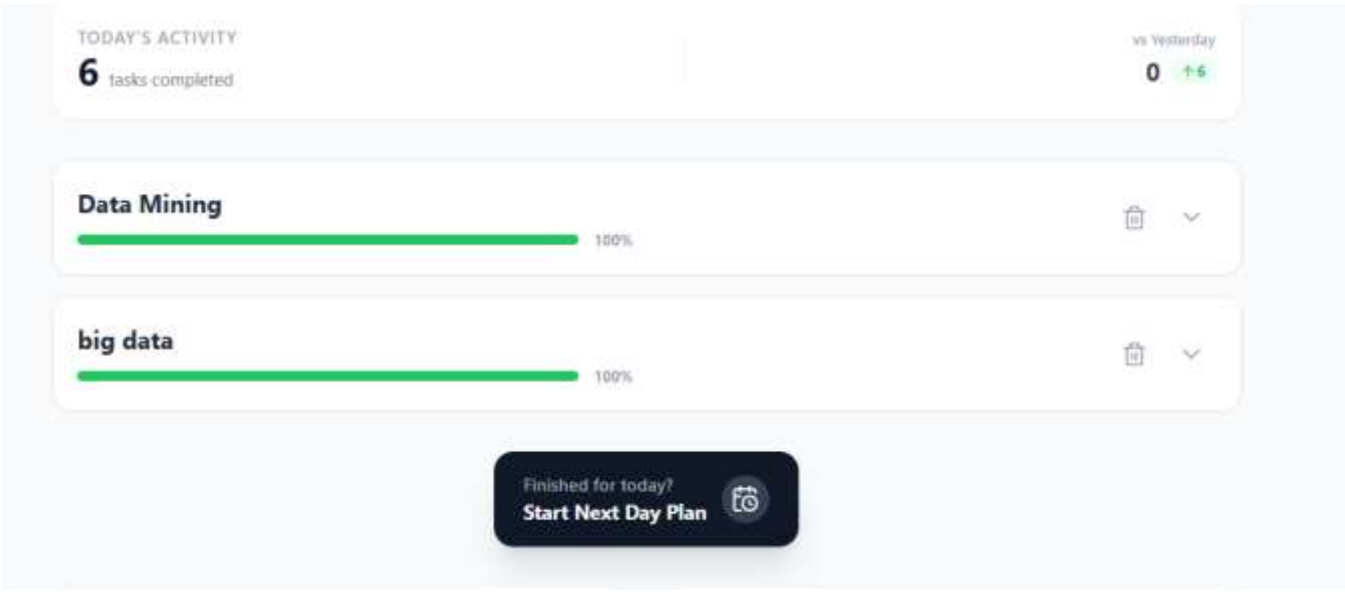
Subject Proficiency

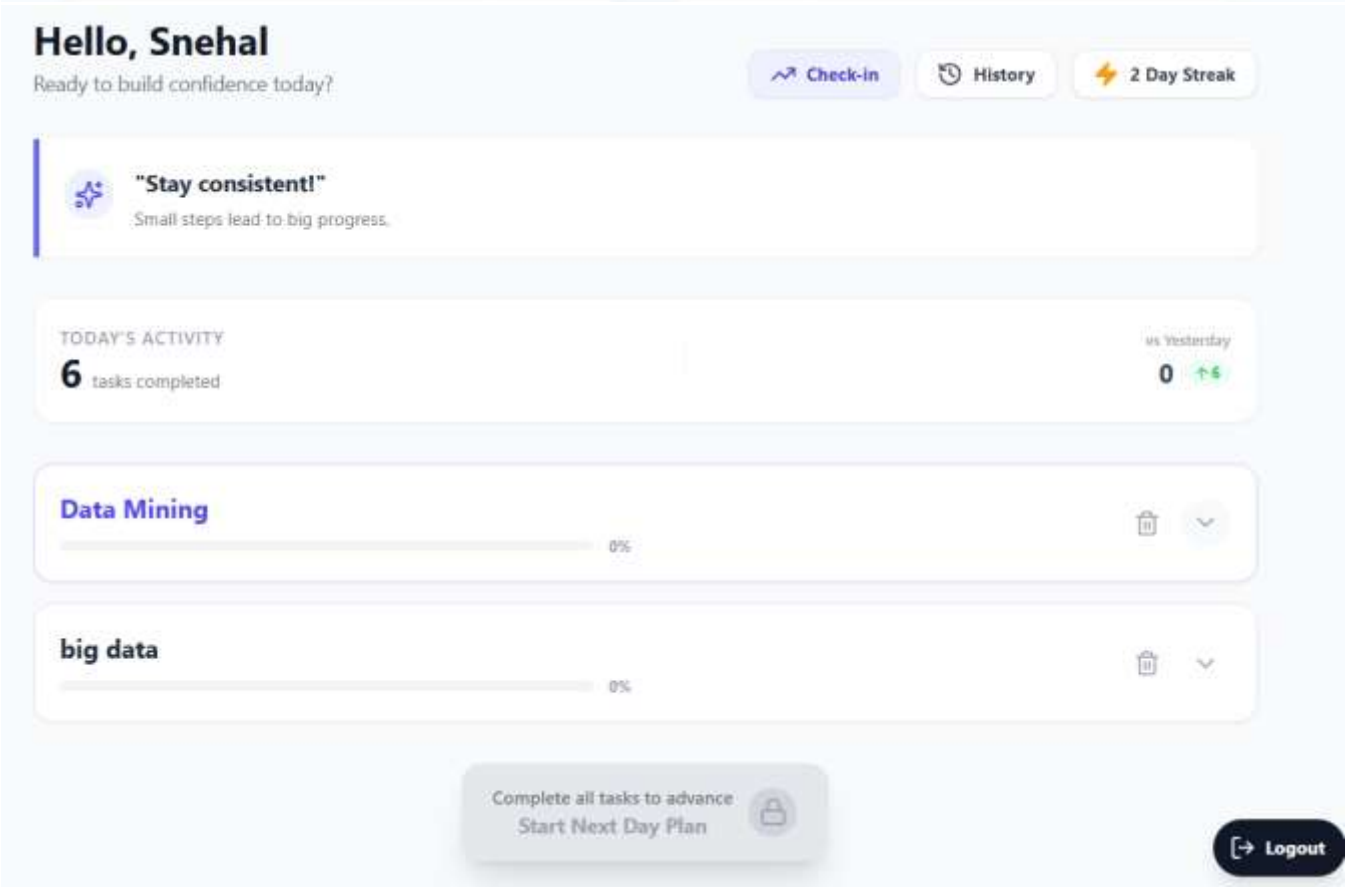
Current Quiz Score Avg (%)

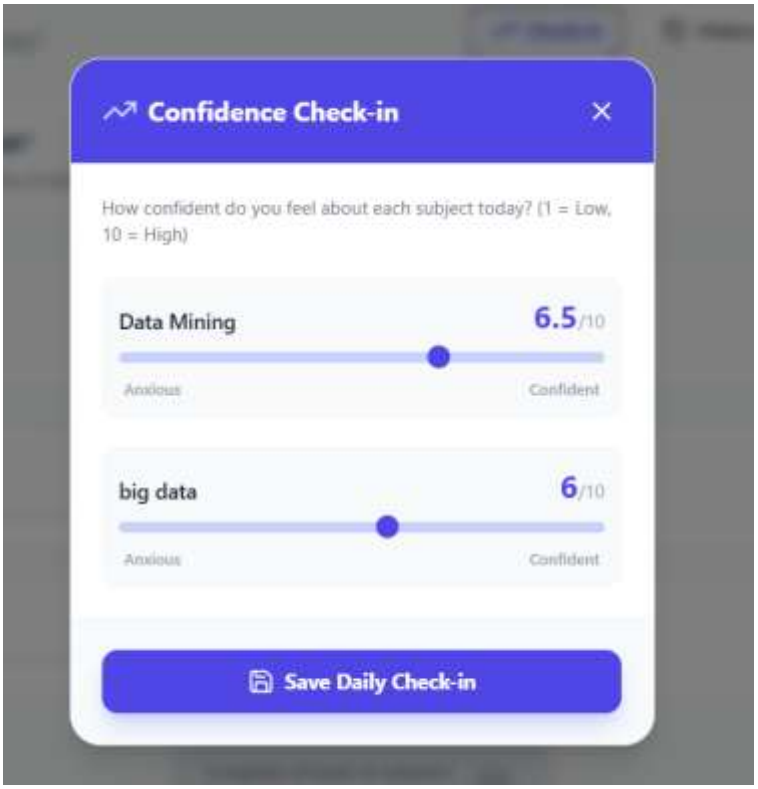
Daily Activity

Completion Rate

Logout


TODAY'S ACTIVITY
6 tasks completed
vs Yesterday
0 ↑6
Data Mining
100%
big data
100%
Finished for today?
Start Next Day Plan


Hello, Snehal
Ready to build confidence today?
Check-in
History
2 Day Streak
"Stay consistent!"
Small steps lead to big progress.
TODAY'S ACTIVITY
6 tasks completed
vs Yesterday
0 ↑6
Data Mining
0%
big data
0%
Complete all tasks to advance
Start Next Day Plan
Logout



Clara Buddy — Full Functional Flow (Simple Explanation)

1. Main Idea

Clara Buddy is a smart study helper app.

It doesn't only show tasks — it creates study material and quizzes automatically from your syllabus using AI.

2. The User Journey

Phase 1 — Login

User opens the app and logs in or signs up.

If new → go to Onboarding

If old user → go to Dashboard

Phase 2 — Onboarding (Setup Your Study Data)

This happens only for new users once.

User enters:

✓ Name

✓ Subjects (Example: Maths, History)

✓ Syllabus chapters for each subject

✓ Confidence level (1–10)

✓ Current performance/grade

Why important:

AI will use this info to generate study content related to your actual syllabus.

Phase 3 — Dashboard (Daily Plan Generation)

When the dashboard opens, Clara Buddy checks:

Do you already have today's study plan?

If no, then AI creates one automatically.

The AI creates:

✓ 2 mini study topics called Micro-Goals

✓ 5 quiz questions for each subject

✨ Smart Tone Adjustment:

If you are weak → explanations are simple & friendly

If you are strong → explanations are more challenging

Dashboard shows:

Subjects

Today’s Micro-Goals

"Take Quiz" button

Phase 4 — Study Session

User clicks a Micro-Goal like:

“Understand the Chain Rule”

The screen shows:

AI-generated explanation in simple notes form

After reading, user clicks:

“Mark as Complete”

Then the topic gets checked off.

Phase 5 — Quiz Session

After studying, user can attempt a quiz.

Quiz contains:

5 questions based on what you just studied

After quiz:

If score is high → confidence increases

If score is low → system remembers and gives easier or more detailed notes next time

So the app adapts to your level.

Phase 6 — Reflection & History

User can view:

Confidence graph

Study history

Daily streaks

Feelings journal (Anxious → Confident)

This helps students track progress over time.

3. Technical Flow

Frontend

Holds main user data

Stores syllabus, confidence, quiz results, micro-goals, etc.

Updates daily plans and subjects

Shows dashboard, study notes, quizzes, and progress

Data Stored Includes:

✓ User profile

✓ Subjects & chapters

✓ Daily tasks

✓ Quiz scores

✓ Confidence levels

✓ Study history

4. Clara Buddy — Daily Cycle Summary

Every day the app works like this:

User opens app

AI reads past progress + syllabus

AI creates:

→ Micro-Goals (study notes)

→ Quiz questions

User studies & takes quiz

App updates:

→ Confidence

→ Scores

→ History

Repeat next day ✓

Super Simple Summary

User enters syllabus → AI turns it into small daily lessons + quizzes → User studies → System adapts difficulty & tracks progress.