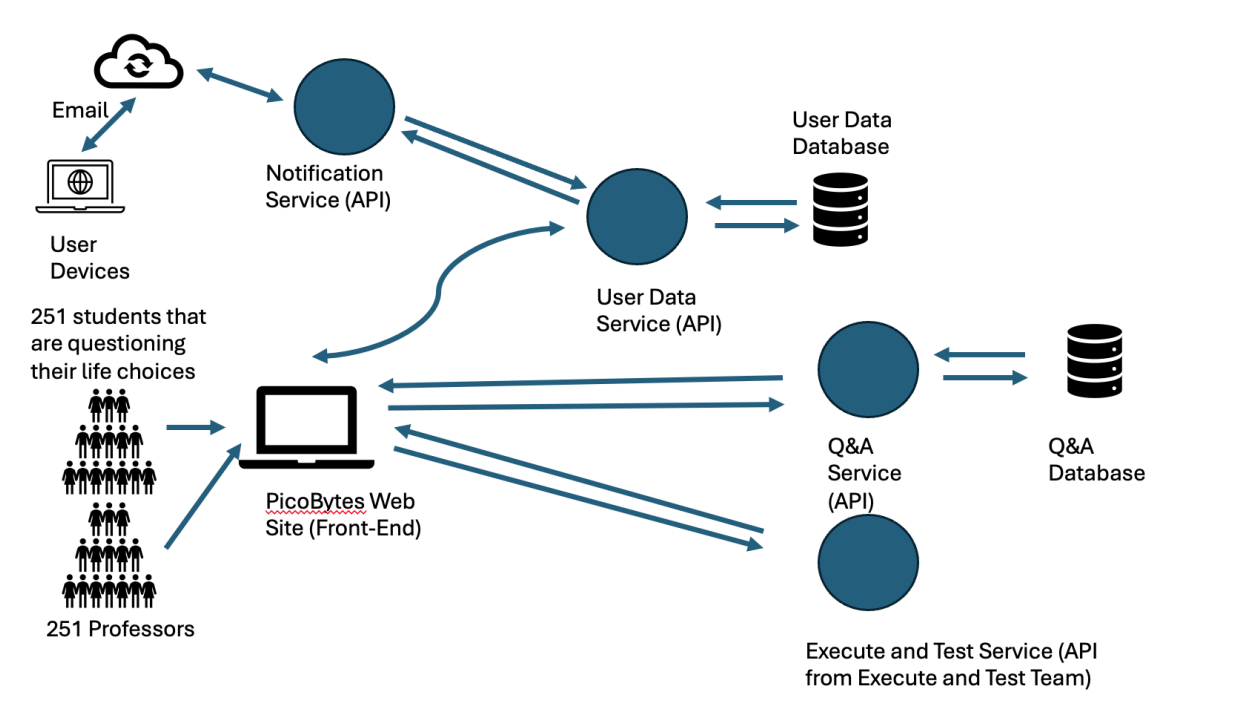System description:

PicoBytes is a web application that allows students to test themselves on the essential skills for the COMP 251 class in an entertaining fashion. With its simple user interface, students can quiz themselves with question types such as multiple choice, true/false, code blocks, and free response code with immediate feedback. Additionally, integration with ChatGPT allows for short answer questions to get immediate feedback from some of the best AI models available today. Students can follow lesson plans picked out by their professor or choose to test themselves on topics they need to review. Email notifications and a leaderboard help encourage students to use the service often. Professors are able to log in and with a seamless click of a button, access an admin dashboard that allows them to add and remove questions from the database. Professors can also hide certain questions from students, view student responses, and see question metrics such as the percentage of students who got the question right.

Road Map 🗺:

Task 🤓	Date 😈	Status 📍
Create and finish design doc	Feb 6, 2025	Completed ⌄
Website Skeleton 💀 Created	Feb 6, 2025	Not Started ⌄

Task 🤓	Date 😈	Status 📌
Regular User Database (User Management/Auth) & Onelogin exploration 🏴‍☠️ & web features to log in	Feb 20, 2025	Not Started ⌄
Question Database & new web features for question	Mar 6, 2025	Not Started ⌄
Admin Feedback & Question Management & admin web interface	Mar 20, 2025	Not Started ⌄
MVP DONE	Mar 20, 2025	Not Started ⌄
Notifications and OneLogin	Apr 3, 2025	Not Started ⌄
Leaderboard, streaks, time taken, game points?	Apr 15, 2025	Not Started ⌄
Make frontend nice	Apr 29, 2025	Not Started ⌄

Architectural Framework:

Frameworks/Languages:
- Python
- Flask
- SQLite
- React with Tailwind

Minimal Viable Product:

- Web Interface
    - Interactive code editor
    - Exercise content
- User management
    - Desired with onelogin
    - Create account
- Question API
    - Support at least 1 type of every questions
        - true/false

- Multiple choice
- Free response code
- Fill in the code
- Free response
- Feedback on questions with a correct answer
- Feedback from admin account
- Paragraph
    - The Minimum Viable Product for PicoBytes™ must provide a secure (enough) web interface for students to practice C programming through interactive exercises. At minimum, the system needs to support user authentication, basic question types (true/false, multiple choice, and at least one code exercise type), and provide immediate feedback on student answers. The MVP must include the core functionality of all four main services: Web interface with basic UI components for student interaction, User Data service for managing accounts and tracking progress, Question & Answer service supporting at least three question types, and a (slightly) secure Execute & Test service for running and evaluating C code submissions (this will be very different, as we will be communicating with the API developed by the other team and simply sending strings of code/testcases, and receive the response)

Non-functional requirements!!!!!!

- Fast response time when loading and answering questions
    - Less than 1 second
- Secure user access
- Input validation on all inputs
- Cross browser compatibility
- Accessible interface
- Support for 10+ users at a time
- Dark mode only
- As a light mode user, I am offended

USER STORIES

EPIC 0 - Web Interface:

- As a student,

  I want accessibility features,

  So that I can learn normally.

- <mark>As a student,</mark>

  <mark>I want to be able to choose certain topics to learn about C programming through some sort of ui,</mark>

  <mark>So that I can practice specific skills.</mark>

- As a student,

  I want instant feedback to my code,

  So that I can fix my code quickly.

- <mark>As a student, I want a specific UI for each type of question, so that I can adequately input my responses.</mark>

- As a student, I want to be able to have access to my profile, so that i can modify and check things about my user profile

- As a student, I want to be able to see how many lessons I have completed, so that I can keep track of my progress learning C

- ==As a student, I want a clear indication of my progress through a lesson topic, so that I know how much of that topic I have learned so far==

- As a student, I want an easy option to sign-in / make an account, so that I can quickly login to the service.

EPIC 1 - User Management:
- As a student,
  I want to create an account,
  So that I can access the lessons
- ==As a student,==
  ==I want to log in/out of my account,==
  ==So that I can prevent unauthorized use==
- As a student,
  I want to view my progress on my page,
  So that I can monitor my progress.
- ==As a *student*,==
  ==I want to be able to edit my profile,==
  ==So that I can update any information.==
  - ==Emails, username, password, etc==
  - ==Connected to OneLogin…?==
- As a student,
  I want to be able to recover my username or password,
  So that I can access my account in case I forget it.
- ==As a student,==
  ==I want to receive email notifications,==
  ==So that I don't miss too many days.==
- ==As a student,==
  ==I want to have a page for Professor feedback,==
  ==So that the feedback is in one place.==
- As a student,
  I want to be able to spend my cabbage points,
  So that I feel rewarded
- As a student,
  I want to there to be achievements,
  So that I know I am progressing
- As a student,
  I want to customize my profile picture,
  So that I can identify myself.

EPIC 2 - Question API/Management:

- <mark>As a student,
  I want the questions to be separated in categories (Difficulty, lessons, etc),
  So that I can find the appropriate questions.</mark>
- As a student
  I want to take X questions
  So that I can test my knowledge
  - with true/false, multiple choice, fill in code, free response as unique user stories
- <mark>As a student
  I want to have questions searchable by concepts
  So that I can test my skills with specific concepts</mark>
- <mark>As a student
  I want to be able to hide questions I've already taken
  So that I don't have to waste my time looking at them</mark>
- <mark>As a teacher
  I want to be able to add questions
  So that I can test more skill</mark>
- <mark>As a teacher
  I want to be able to remove questions
  So that I can remove questions that aren't helpful</mark>
- As a student
  I want to be able to sort questions by most recently added
  So that I can see new quesarito

EPIC 3 - Admin Access/Feedback:
- As an admin,
  I want to monitor platform usage and collect feedback,
  So that I can improve the learning experience
  - ***3.1 - Admin Dashboard/Platform Overview Dashboard
    - As an admin
    - I want a centralized dashboard
    - So that I can monitor platform activity
    - AC:
      - View real-time system status
      - Display active user metrics
      - Show content user statistics
      - Present key performance indicators
  - ***3.2 - Student Performance Analytics
    - As an admin
    - I want to analyze student performance data
    - So that I can identify areas for improvement
    - AC:
      - Track completion rates by topic
      - Analyze common error patterns
      - Monitor time spent per lesson

- - - ● Generate performance reports
  - ○ ***3.3 - User Support and Feedback
    - ■ As an admin
    - ■ I want to manage user support and feedback
    - ■ So that I can maintain platform quality
    - ■ AC:
      - ● Process support tickets
      - ● Track user-reported issues
      - ● Manage feedback responses
      - ● Monitor resolution status
  - ○ ***3.4 - User Account Administration
    - ■ As an admin
    - ■ I want to manage user accounts
    - ■ So that I can assist with account-related issues
    - ■ AC:
      - ● Reset user credentials
      - ● Modify account settings
      - ● Handle account issues
      - ● Manage notification preferences
  - ○ ***3.5 - Content Quality Control
    - ■ As an admin
    - ■ I want to monitor content quality
    - ■ So that I can ensure educational effectiveness
    - ■ AC:
      - ● Review exercise metrics
      - ● Track question effectiveness
      - ● Monitor user ratings
      - ● Manage content versions
  - ○ ***3.7 - Question Management
    - ■ As an admin
    - ■ I want to manage the question bank
    - ■ So that I can maintain and improve the learning content
    - ■ AC:
      - ● add/edit/remove questions through admin interface
      - ● Bulk organize questions by category
      - ● Update question difficulty ratings based on performance
      - ● Toggle question visibility (active/inactive)