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# Features

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## 1. User Authentication & Profile Management (Week 1–2)

### Authentication

- User Registration (email, username, password)
- User Login / Logout
- Django-secured session management
- Forgot password (Django auth)
- Custom user model (single table)

### User Profile

- Full Name
- Avatar/Profile Picture upload
- Preferences:
  - Preferred categories
  - Preferred difficulty
- Update profile anytime
- Secure password hashing (Django)



## User Dashboard Summary

Shows at a glance:

- Total quizzes taken
  - Average score
  - Best category
  - Weak category
  - Overall improvement trends
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## 2. Category & Subcategory Navigation (Week 3–4)

### Top-level Categories

- Academic
- Entertainment
- General Knowledge

### Multi-level Subcategories (dynamic hierarchy)

Example flow:

Academic → Engineering → CS → Java

Supports unlimited nesting:

- Academic
  - 10th

- 12th
- Engineering
  - CS
    - Python
    - Java
    - DSA
  - Mechanical
  - Civil
- Medical

User can take quiz **ONLY** on leaf nodes, e.g., Java.

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## 3. AI-Based Dynamic Question Generation

### Question Generation Engine

Uses:

- Gemini API
- GPT API (OpenAI)
- Flexible prompt-based system

### Features

- Automatic generation of MCQ questions
- Balanced difficulty distribution:

- Easy = 40%
- Medium = 40%
- Hard = 20%

## **Customization options**

User can choose:

- Difficulty: Easy / Medium / Hard
- Number of questions: 10 / 20 / 30
- Timer duration (auto-calculated)

## **Stored Snapshot**

Each question stores:

- question text
- options (A, B, C, D)
- correct answer
- explanation
- AI metadata (model used, tokens, prompt)

No need to store static questions in DB — everything dynamic!

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## 4. Quiz Attempt Management (Week 5–6)

### Quiz Features

- Start quiz
- Timer countdown
- Next/Previous question navigation
- Save & resume quiz later (ongoing attempts stored)
- Auto-save user answers

### User Controls

- Skip question
- Mark for review
- End quiz anytime

### Scoring

- Auto-score calculation
  - Correct/Incorrect count
  - Score percentage
  - Weighted scoring (if needed)
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## 5. Quiz Results & Learning Support

At the end of the quiz, user sees:

- Total score
- Time taken
- Difficulty level summary
- Correct answers
- Wrong answers

### AI-Based Explanation Engine

For every incorrect answer:

- Show explanation generated by AI
  - Show external reference links
  - Suggest the topic to study
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## 6. User History & Analytics Dashboard

### History Tracking

User can view:

- Completed quizzes
- In-progress quizzes (resume)
- Category-wise performance
- Date-wise performance graph

## Detailed Quiz Report

For every quiz attempt:

- Questions attempted
- Answers selected
- Correct answer
- Explanation
- Timestamp

## Performance Analytics

- Average accuracy
  - Best performing category
  - Worst performing category
  - Improvement suggestions
  - Personalized recommendations
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# 7. Daily Streak & Gamification

## Streak Features

- Track daily quiz participation
- Show number of consecutive days
- Award bonus points for streak (future scope)
- Notifications for streak break warning (future scope)

# 8. System-Level Features

## Admin Panel

- Manage users
- Add/Edit/Delete categories & subcategories
- View quiz attempts
- Moderate system activity

## Database Optimization

- Indexing on user + started\_at
- Composite index on category + subcategory
- Storing only snapshots → extremely lightweight DB
- Scalable for high traffic

## Security

- CSRF protection
- Password hashing
- Role-based access (admin vs user)
- Restricted quiz start endpoints



## 9. Future Enhancement Options (for report)

- Leaderboard (daily/weekly/global)
- Difficulty-adaptive quizzes (AI adjusts difficulty automatically)
- Bookmark questions
- Mock-tests generation
- AI tutor chatbot
- Voice-based quiz mode