

Knight Foundation School of Computing and Information Sciences

Fall 2025 Senior Design Project

Gamified Habit Tracker: Leveling Up Everyday Routines

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PROBLEM

Most people struggle to maintain positive habits because traditional tracking apps lack the psychological reinforcement needed for long-term motivation.

Without immediate rewards or visible progress, users abandon their goals within weeks. Gamified Habit Tracker applies proven behavioral psychology—positive reinforcement, progressive goals, and social accountability—through RPG mechanics.

Users earn XP across five life attributes (Strength, Intelligence, Creativity, Social, Health), unlock achievements, and compete on leaderboards. AI-powered difficulty assessment ensures fair rewards, creating the dopamine-driven feedback loops that sustain behavioral change.

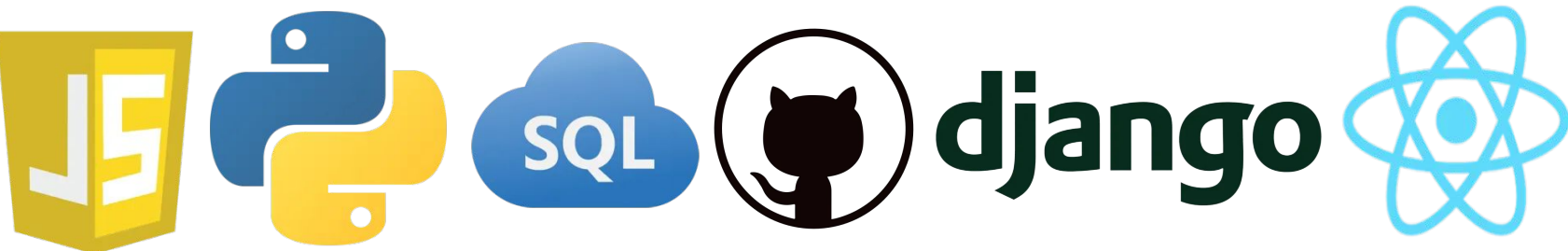
The result: users build sustainable routines that genuinely improve their physical health, mental well-being, creativity, and social connections—transforming tedious habit-tracking into an engaging journey of self-improvement.

VERIFICATION

- Unit tests validate core game logic including XP calculation, level progression, and achievement unlock conditions.
- Integration tests verify API endpoints for habit completion, XP awards, and leaderboard ranking updates.
- User acceptance testing ensures the complete habit-tracking workflow and gamification features function as intended.
- Performance testing measures API response times and database query efficiency to meet the 500ms requirement.
- Automated test suites run after each code change to catch regressions, while manual testing validates cross-platform compatibility.
- Load testing simulates concurrent users logging habits to verify system stability and database consistency.
- Security testing validates token authentication, password encryption, and user data protection measures.

SYSTEM DESIGN

- **Tech Stack:** Django REST API + React frontend with token-based auth and RESTful design.
- **AI Integration:** OpenAI GPT-4o-mini automatically calculates XP rewards based on habit difficulty analysis.
- **Core Mechanic:** Habit completion earns XP across 5 attributes (Strength, Intelligence, Creativity, Social, Health).
- **Gamification:** 21 achievements, character progression (3 unlockable characters), equipment system, and tower combat mini-game.
- **Social & Persistence:** Global leaderboard, daily check-ins, SQLite database with production scalability.



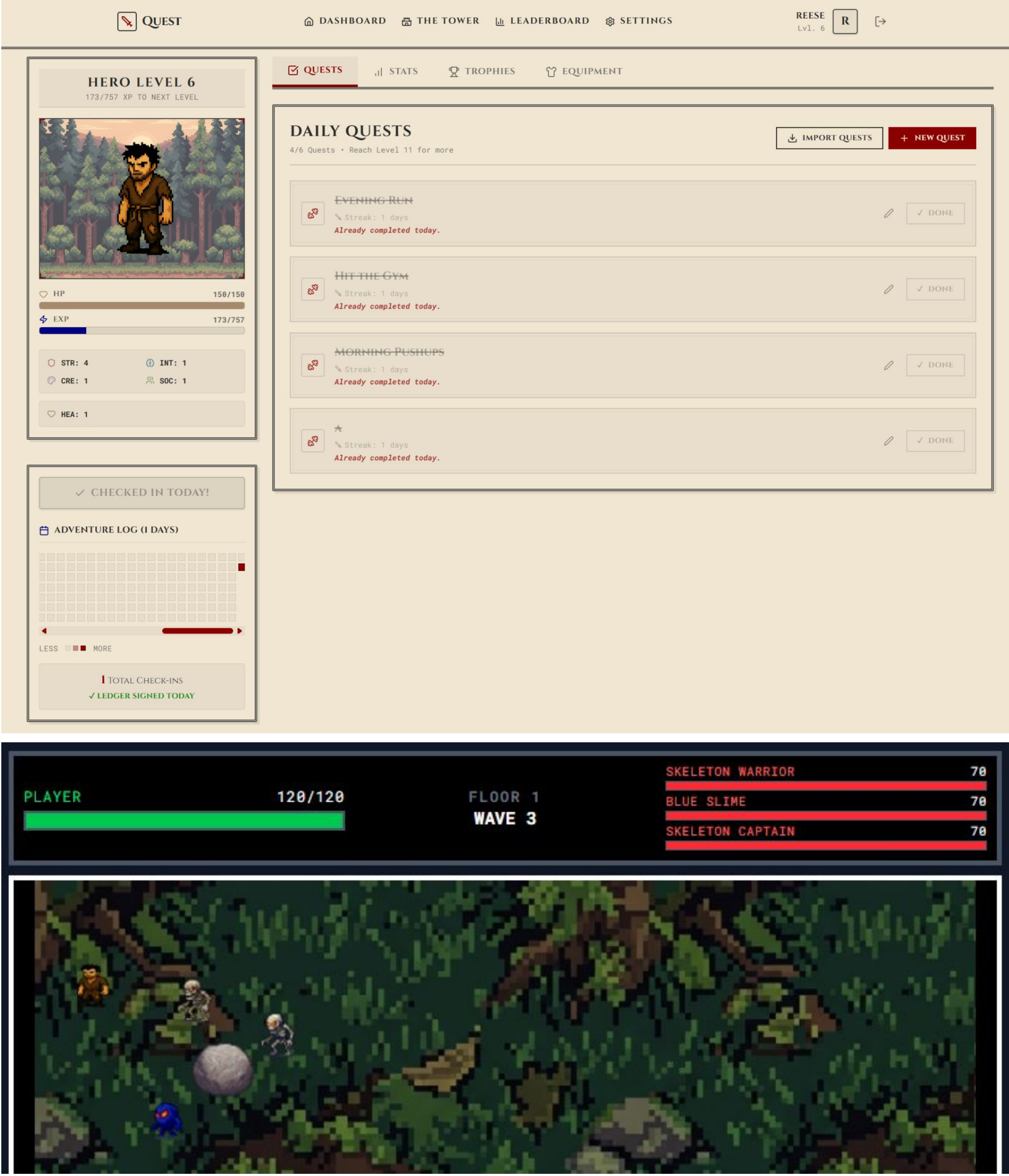
SOLUTION

Our capstone project, Gamified Habit Tracker, tackles the motivation crisis in habit-building by transforming daily routines into an engaging RPG adventure. We leverage positive psychological reinforcement—the same dopamine-driven mechanics that make games addictive—to help users build genuinely healthy, consistent habits that improve their lives.

The app turns habits into "quests" where users earn XP, level up across 5 life-improving attributes (Strength, Intelligence, Creativity, Social, Health), unlock achievements, and compete on leaderboards. AI-powered difficulty assessment using OpenAI's GPT-4o-mini ensures every accomplishment feels fairly rewarded, sustaining motivation over months rather than days.

Built with a Django REST API and React frontend, the system provides daily check-ins for consistency, character progression that visualizes personal growth, equipment unlocks that reward milestones, and real-time tower combat that makes habit streaks exciting. The result: users don't just track habits—they actively look forward to completing them, developing sustainable routines that enhance their fitness, learning, creativity, relationships, and overall well-being.

USER INTERFACE



REQUIREMENTS

Functional Requirements:

- Users can create, edit, and delete habits with customizable XP rewards.
- Users can log habit completions and view streaks.
- System automatically calculates XP gains and level progression.
- Users can unlock and equip character customization items.
- System tracks daily check-ins and awards 100 XP.
- Users can view character stats, achievements, and equipment.
- Global leaderboard displays users ranked by level and XP.
- Achievement system automatically unlocks badges at milestones.
- Admin panel manages users, habits, and achievements.
- User authentication via token-based login.

Non-Functional Requirements:

- Real-time XP and stat synchronization across frontend and backend.
- API response time under 500ms. for habit operations.
- Responsive UI on desktop and mobile devices.
- Support 100+ concurrent users without degradation.
- All user data encrypted and securely stored.
- 99% system uptime for habit tracking.
- Code follows Django and React best practices.