

PyQUEST

Students: Jennifer Mesa, Ana Martinez, Angel Duarte, Jaqueline Lopez, Julian Novak
Instructor/Faculty: Masoud Sadjadi, Florida International University

PROBLEM

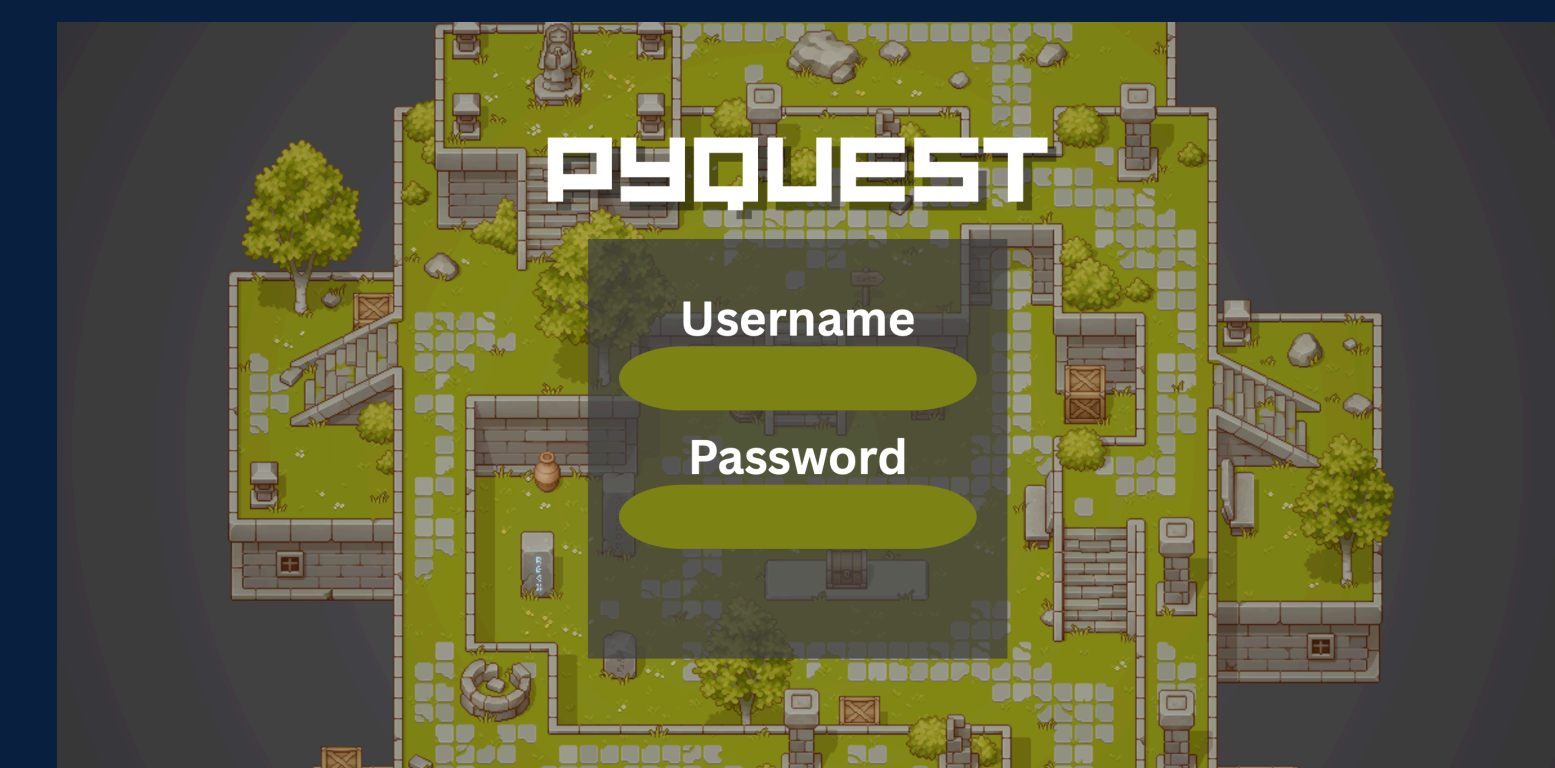
Technology is evolving faster than many schools can keep up with, and early programming education is often overlooked. Many classrooms lack age-appropriate tools to teach foundational coding concepts, which leaves young learners without exposure to essential digital skills. Children need a fun, interactive, and developmentally appropriate way to learn Python, especially when traditional resources are too advanced or unengaging.

REQUIREMENTS

- Simple login system
- Level selection menu
- Guided lessons and integrated quizzes
- Progress tracking within the app
- Success metric: A fully functional demo where users can complete a full lesson and quiz cycle

IMPLEMENTATION

- Built entirely in Unity using C# scripts edited in VS Code.
- Unity's 2D tools handle movement, collisions, animations, and interactions.
- Code organized by features: player movement, chest interaction, quizzes, and level loading.
- Each Unity scene (Login, Menu, Level Select, Gameplay) contains its own GameObjects and scripts for clarity.
- All game logic runs locally with no external servers or databases.
- Sprite animations controlled through the Unity Animator, while Tiled maps are imported for quick level creation.



TESTING & EVALUATION

- Manual UI testing for menu navigation and button flow.
- User feedback collected from children, family, and friends to improve clarity of lessons and quiz prompts.
- Verified quiz logic to ensure correct answers are recognized and incorrect answers give helpful guidance.
- Confirmed scene transitions and level unlocking work as intended.

SUMMARY

PyQuest is a beginner-friendly educational game designed to make learning Python engaging and accessible for children. Built in Unity with simple navigation and clear visuals, the app guides players through structured lessons and quizzes that reinforce key programming concepts. Each level unlocks only after successful quiz completion, helping children build confidence step by step. With local data handling, safe design choices, and feedback from young testers, PyQuest provides a fun, secure, and interactive introduction to coding while laying the foundation for continued growth in future versions of the game.

SYSTEM OVERVIEW

- Unity-based 2D game developed in C#.
- Organized using multiple Unity scenes: Login, Main Menu, Level Select, Gameplay Levels.
- Character movement, animations, and interactions (e.g., opening treasure chests) are controlled through C# scripts.
- Level layouts are built using Tiled, then imported to Unity through SuperTiled2Unity.
- Architecture uses a screen-based navigation flow: Login → Menu → Level Select → Gameplay.
- Data stored locally in app memory (username + current level progress).



DEPLOYMENT & OPERATIONS

- Run the app by opening the Unity project and pressing Play.
- Development handled entirely in Unity + VS Code.
- No backend server required.
- Built for mobile platforms.

SECURITY, PRIVACY, & ACCESSIBILITY

- No external data storage — all user data stored only in temporary in-app variables.
- Accessibility features include large fonts, high-contrast colors, and simplified language.
- No networking, external APIs, or personal data collection, making the app safe for minors.

LIMITATIONS & FUTURE WORK

CURRENT LIMITATIONS

- Only a few lessons and levels implemented so far.
- No long-term data saving (progress resets each session).
- Basic animations and placeholder art due to functionality-first development.

FUTURE ENHANCEMENTS

- Add more levels, puzzles, and Python lessons.
- Create boss battles for each level.
- Implement cloud or file-based saving.
- Improve sprite animations and add character dialogue or cutscenes.
- Export builds for mobile and desktop platforms.

REFERENCES

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