CIPHER GAME - GAME DESIGN DOCUMENT (GDD)

GitHub Repository: https://github.com/ShahzainAli23/CyberSecurityGame

Team Members:

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1. Game Title:

Cipher Game

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2. Vision Statement:

To create an engaging, puzzle-based 2D educational game where the core mechanic involves solving classical ciphers. The game teaches players how to recognize and use various encryption techniques through interactive, story-driven gameplay.

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3. Goal:

The goal is to provide high-school and early university students with an entertaining way to learn fundamental cryptography concepts, improving their critical thinking and problem-solving skills.

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4. Learning Objectives:

- Identify and differentiate between Caesar, Vigenère, substitution, and reverse ciphers.
- Interpret environmental hints and context clues.
- Apply logic and cipher-solving strategies to decode messages.
- Reinforce concepts through immersive gameplay and narrative.

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5. Target Audience:

Students aged 14+, especially those studying Information Security, Computer Science, or Mathematics.

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6. Core Gameplay:

- The player explores a top-down 2D pixel-art environment.
- They interact with objects (TVs, notes, doors) to receive clues.
- Solving a puzzle opens a path forward (via password entry).
- The journal system keeps track of hints and cipher notes.
- Final puzzle leads to game completion.

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7. Cipher Types Covered:

- Caesar Cipher
- Vigenère Cipher
- Atbash Cipher
- Simple Substitution

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8. Controls:

- Movement: WASD / Arrow Keys
- Interact: C
- Open Journal: Tab

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9. Storyline:

You play as a secret agent trapped in a facility. The only way to escape is by solving a series of cipher puzzles left behind by a mysterious figure. As you progress, the puzzles become harder and the truth behind your mission begins to unfold.

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10. Visual & Audio Style:

- Pixel art using 32x32 tile sets (some custom, some from itch.io)
- All original dialogue and layout
- Sound effects for movement, interaction, puzzle success/failure, and background music

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11. Game Structure & Flow:

1. Titlescreen → Play Button
2. Main Scene loads Tileset with interactables
3. Player solves 4 cipher-based puzzles to open doors
4. Final puzzle leads to red TV (ending password)
5. Correct password replaces it with blue TV
6. Interacting with blue TV ends the game

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12. User Guide Summary:

- Use movement keys to explore.
- Interact with objects to read hints.
- Journal stores key notes and cipher clues.
- Enter passwords when prompted.
- Think critically and apply cipher knowledge to progress.

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13. Work Division:

- Fatima: Journal system, dialogue logic, journal UI
- Arbaz: Player movement, interactions, door logic
- Babar: Puzzle design, level layout, cipher hint design
- Sarfaraz: Sound integration, polish, build/export

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14. Risks & Mitigation:

- Risk: Godot limitations — Solution: scoped project tightly, reused node templates
- Risk: Time management — Solution: split responsibilities early
- Risk: Sound/animation lag — Solution: switched to lightweight formats

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15. Pedagogical Integration:

- Hints require recall and deduction, mimicking classroom puzzle-solving.
- Each puzzle reinforces cipher mechanics with immediate feedback.
- Non-linear hint discovery promotes exploratory learning.

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16. Future Improvements & Market Potential:

The current build serves as a strong foundation for further development. The game's modular scene structure and clean scripting make it very easy to expand.

Planned or potential improvements include:

- More cipher types and levels.
- Branching storylines with multiple endings.
- Boss battles where players solve puzzles under pressure.
- Turn-based or timing-based battle mechanics integrated with cipher-solving.
- Custom level editor for user-generated challenges.
- Leaderboards and scoring system for wider replayability.

With these additions, the game can be positioned as both an educational tool and a marketable indie title for puzzle-loving audiences.

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17. Final Notes for Evaluation:

The game is complete in terms of core educational goals, gameplay structure, and usability. Every mechanic serves both a gameplay and instructional purpose.

A full technical design document is attached separately to cover architecture, engine decisions, and internal logic.

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