

CodeVent: Where Coding meets Adventure

Description/Overview - CodeVent is an educational Java console application that transforms learning programming into an engaging adventure game. Designed for beginners, this interactive platform teaches fundamental Java concepts through a gamified experience featuring colorful console interfaces, interactive lessons, and challenging quizzes.

The application addresses the common struggle students face when learning programming - the complexity and dryness of traditional tutorials. By framing programming concepts as exciting adventures and challenges, CodeVent makes learning Java intuitive, memorable, and enjoyable.

Key Features:

- 16 Comprehensive Java Lessons covering syntax to advanced concepts
- Interactive Quiz System with immediate feedback and scoring
- Gamified Learning Experience with adventure-themed progression
- Colorful Console Interface with ASCII art and animations
- Structured Learning Path from beginner to intermediate topics

OOP Concepts applied -

Encapsulation

- All class fields are declared as `private` with controlled access through public getters and setters
- The `Quiz` class encapsulates scanner management and quiz logic
- `Help` class encapsulates all tutorial content and display methods

- Lesson classes encapsulate their specific educational content and display logic

Inheritance

- Lesson classes inherit common structure and behavior through shared design patterns
- Quiz system uses consistent method signatures across different topic implementations
- Color management and console utilities follow inherited patterns

Polymorphism

- Dynamic method dispatch through the lesson selection system
- Overloaded constructor methods in multiple classes
- Interface-like behavior through consistent `startMenu()` methods across classes
- Runtime binding in quiz answer validation system

Abstraction

- Abstract game flow control separated from concrete implementation
- High-level menu systems abstracting complex user interactions
- Modular design allowing independent development of lessons, quizzes, and UI components
- Separation of educational content from game mechanics

4. Program Structure -CodeVent/

- |— CodeVent.java (Main Controller)
 - | |— Manages overall application flow
 - | |— Displays main menu and ASCII art
 - | |— Coordinates between all components
- |— Lessons.java (Lesson Manager)
 - | |— Handles lesson selection menu
 - | |— Routes to individual lesson classes
 - | |— Manages lesson progression
- |— Quiz.java (Assessment System)
 - | |— Manages quiz selection interface
 - | |— Implements 16 topic-specific quizzes
 - | |— Handles scoring and feedback
 - | |— Provides immediate answer validation
- |— Help.java (Tutorial System)
 - |— Comprehensive game tutorial
 - |— Learning guidance and tips
 - |— Interactive help menu system

Relationships

- CodeVent aggregates Lessons, Quiz, and Help
- Lessons composes individual lesson implementations
- Quiz contains multiple quiz topic implementations
- All classes follow the Single Responsibility Principle

5. How to Run the Program -

-Java JDK 8 or higher

-Command line terminal or IDE

Step-by-Step Instructions:

1. **Download the Project:** git clone <https://github.com/frzjl103-lgt/CodeVent.git>
2. **Go to cmd and type :** cd CodeVent
3. **Compile the Program:** javac CodeVent.java
4. **Run the Application:** java CodeVent
5. **Using an IDE:**
 - Open the project in Eclipse, IntelliJ, or VS Code
 - Locate CodeVent.java in the CodeVent package
 - Run the main class (CodeVent.java) directly

Navigation:

1. Select options using number keys (1-4)
2. Follow on-screen instructions for lessons and quizzes
3. Use '0' to exit menus and return to previous screens

6. Sample output -



7.

Authors:

Boñon, Franz Jacob - In line with applying the logics and the principles of OOP, as well as implementing the ASCII colorful codes and animations.

Factor, Brent Jeric - For creating all the quizzes in the project and analyzing each logic on how to connect it with the main class.

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- W3Schools for comprehensive Java documentation and learning resources
- Java Platform for robust console application capabilities
- Educational Researchers whose work inspired gamified learning approaches
- Open Source Community for best practices in software design and documentation

Future Enhancements

Expanding the topic and concepts into professional-level codes, since the project's scope is until arrays only, as well as adding a user login to the program to make it more usable when it comes to many users.

References

W3Schools Java Tutorials

Oracle Java Documentation

Gamification in Education Research Papers

Technical References:

Java Console Application Best Practices

ANSI Color Codes for Terminal Applications

Object-Oriented Design Principles

Software Architecture Patterns