



# ConsoleGUI

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— <https://github.com/Cyphonvoid/ConsoleGui>

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## Overview

ConsoleGUI is a single threaded C++ library designed for rendering user interfaces within a console environment. It leverages ANSI escape sequences to manipulate text, graphics, formatting, positioning, and RGB colors. ConsoleGUI provides ready to use customizable



built in user interface components enabling the creation of colorful, interactive and easy to use interfaces mitigating limitations of terminal based user interfaces.

## Code Design & Implementation

ConsoleGUI leverages core object-oriented programming (OOP) principles to deliver an intuitive and extensible user interface development experience.

**Encapsulation and Abstraction:** UI elements are modeled as classes, encapsulating data (member variables) and functionality (member functions) specific to each element. This promotes data protection and simplifies interaction with UI components.

**Inheritance and Polymorphism:** The library facilitates a hierarchical organization of UI elements through inheritance. Base classes define core functionalities, while derived classes inherit and extend these functionalities for specialized elements (e.g., buttons inheriting from a generic drawable element). Polymorphism enables dynamic binding, allowing uniform treatment of different UI element types within the application.

**Graph-based Data Structure:** ConsoleGUI employs a graph data structure to represent the UI layout. Elements are organized as nodes, with parent-child relationships established to depict the containment hierarchy. This structure efficiently propagates events and visual effects throughout the UI.

**Compiler Compatibility:** The library's code adheres to standard C++ practices, ensuring compatibility with mainstream C++ compilers like g++ and gcc within the GNU Compiler Collection (GCC). This broadens development toolchain options and simplifies the build process.