**Numbering Conversion System**

## **Overview**

The Numbering Conversion System is a C++ application designed for converting numbers between different bases: Decimal, Binary, Octal, and Hexadecimal. It features a user-friendly interface that allows users to input numbers and select the desired conversion type. The system is composed of multiple classes, each responsible for different aspects of the application.

## **Components**

The system is divided into several classes, each responsible for specific functionalities:

1. **clsScreen**
2. **clsConvertor**
3. **clsMainMenue**
4. **clsBinaryConvertorScreen**
5. **clsDecimalConvertorScreen**
6. **clsHexadecimalConvertorScreen**
7. **clsOctalConvertorScreen**

### **Header Files**

* clsScreen.h
* clsConvertor.h
* clsMainMenue.h
* clsBinaryConvertorScreen.h
* clsDecimalConvertorScreen.h
* clsHexadecimalConvertorScreen.h
* clsOctalConvertorScreen.h

## **Classes and Their Responsibilities**

### **clsScreen**

**Purpose:** Provides basic screen functionalities, such as drawing headers, menus, and displaying results.

**Public Methods:**

* static void DrawHeaderScreen(string Title, string SubTitle = "")
  + **Description:** Draws the header of the screen with a title and optional subtitle.
* static void DrawMenuOptions()
  + **Description:** Draws the menu options for number conversions.
* static void PrintResult(string Result)
  + **Description:** Prints the result of the conversion.

### **clsConvertor**

**Purpose:** Handles conversion operations between different number bases.

**Public Methods:**

* static string GetUserInput()
  + **Description:** Retrieves user input from the console.
* static string DecimalToBinary(double decimal)
  + **Description:** Converts a decimal number to binary.
* static double BinaryToDecimal(const string& binary)
  + **Description:** Converts a binary number to decimal.
* static string DecimalToHexadecimal(double decimal)
  + **Description:** Converts a decimal number to hexadecimal.
* static double HexadecimalToDecimal(const string& hex)
  + **Description:** Converts a hexadecimal number to decimal.
* static string DecimalToOctal(double decimal)
  + **Description:** Converts a decimal number to octal.
* static double OctalToDecimal(const string& octal)
  + **Description:** Converts an octal number to decimal.
* **Conversion Methods Between Different Bases:**
  + static string BinaryToOctal(const string& binary)
  + static string BinaryToHexadecimal(const string& binary)
  + static string HexadecimalToBinary(const string& hex)
  + static string HexadecimalToOctal(const string& hex)
  + static string OctalToBinary(const string& octal)
  + static string OctalToHexadecimal(const string& octal)

### **clsMainMenue**

**Purpose:** Manages the main menu and navigation between different conversion screens.

**Public Methods:**

* static void ShowMainMenueScreen()
  + **Description:** Displays the main menu and handles user selection for different conversion types.

### **clsBinaryConvertorScreen**

**Purpose:** Provides the user interface and conversion functionalities for binary numbers.

**Public Methods:**

* static void ShowBinaryConvertorScreen()
  + **Description:** Displays the binary conversion screen, handles user input, and performs conversions to Decimal, Octal, and Hexadecimal.

### **clsDecimalConvertorScreen**

**Purpose:** Provides the user interface and conversion functionalities for decimal numbers.

**Public Methods:**

* static void ShowDecimalConvertorScreen()
  + **Description:** Displays the decimal conversion screen, handles user input, and performs conversions to Binary, Octal, and Hexadecimal.

### **clsHexadecimalConvertorScreen**

**Purpose:** Provides the user interface and conversion functionalities for hexadecimal numbers.

**Public Methods:**

* static void ShowHexadecimalConvertorScreen()
  + **Description:** Displays the hexadecimal conversion screen, handles user input, and performs conversions to Decimal, Binary, and Octal.

### **clsOctalConvertorScreen**

**Purpose:** Provides the user interface and conversion functionalities for octal numbers.

**Public Methods:**

* static void ShowOctalConvertorScreen()
  + **Description:** Displays the octal conversion screen, handles user input, and performs conversions to Decimal, Binary, and Hexadecimal.

## **How It Works**

1. **Main Menu:** The user starts by interacting with the clsMainMenue class, which displays the main menu and allows the user to select the desired conversion type.
2. **Conversion Screens:** Depending on the user's choice, the program navigates to the appropriate conversion screen (clsBinaryConvertorScreen, clsDecimalConvertorScreen, clsHexadecimalConvertorScreen, or clsOctalConvertorScreen).
3. **Input and Conversion:** The selected screen class retrieves user input, performs the necessary conversion using methods from clsConvertor, and displays the result.
4. **Navigation:** After displaying the result, the user is given an option to go back to the main menu.

## **Example Usage**

To run the application, include the main menu header file and call clsMainMenue::ShowMainMenueScreen() in your main function:

## **Troubleshooting**

**Common Issues:**

* **Invalid Input:** Ensure the input is valid for the selected conversion type. The system handles errors for invalid formats.
* **Header File Issues:** Verify that all required header files are included and properly referenced.
* **Conversion Errors:** Check the conversion methods for edge cases and ensure proper handling of all number formats.

## **Contributing**

**How to Contribute:**

* Fork the repository and make your changes.
* Follow the coding standards and conventions used in this project.
* Submit a pull request with a clear description of your changes and any new features or fixes.
* **License**

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