**File Compressor (Compresso)**

**Project Overview**

This project is a file compression tool with an integrated encryption feature. It uses the **Lempel-Ziv-Welch (LZW)** algorithm to reduce file size efficiently and provides optional encryption using **AES (Advanced Encryption Standard)** to secure files. The project includes a user-friendly **Graphical User Interface (GUI)** built with Java Swing, enabling easy interaction for compressing and decompressing files.

**Features**

* **File Compression**: Reduces file size using the LZW algorithm.
* **File Decompression**: Restores files to their original state.
* **Encryption**: Secures compressed files with AES encryption (password-protected).
* **User-Friendly GUI**: Simple interface for browsing, compressing, and decompressing files.

**How to Run the Project**

**Prerequisites**

1. **Java Development Kit (JDK)**:
   * Ensure JDK 8 or higher is installed on your system.
   * Add java and javac to your system's PATH environment variable.
2. **Required Files**:
   * Download the project folder, which includes:
     + FileCompressionGUI.java
     + LZWCompressor.java
     + LZWDecompressor.java
     + Supporting .class files and icons.

**Steps to Run**

**Option 1: Using an IDE**

1. Open an Integrated Development Environment (IDE) like **IntelliJ IDEA**, **Eclipse**, or **VS Code**.
2. Import the project folder into the IDE.
3. Compile all the .java files.
4. Run the FileCompressionGUI class.

**Option 2: Using the Command Line**

1. Navigate to the project folder in the command prompt or terminal.
2. Compile all Java files:

bash

javac \*.java

1. Run the main program:

bash

java FileCompressionGUI

**How to Use the Application**

1. **Launch the Application**:
   * Run the program to open the GUI.
2. **Browse and Select a File**:
   * Click on the **"Browse File"** button to choose a file from your system.
3. **Compress the File**:
   * Click **"Compress"**.
   * Set a password for encryption (optional) or skip it for regular compression.
   * The compressed file will be saved with a .zip extension.
4. **Decompress the File**:
   * Click **"Decompress"**.
   * If the file was encrypted, enter the correct password to decrypt it. Otherwise, proceed without a password.
   * The decompressed file will be restored to its original state.

**Important Notes**

* Ensure the selected file is accessible and not in use by another application.
* The project supports text-based and binary files but works best with text files for higher compression efficiency.
* Encrypted files can only be decompressed with the correct password.

**Project Links**

* **GitHub Repository**: https://github.com/bhuttoahsanullah/File\_Compressor\_DSA\_Project.git