# 🔐 JavaFX Encryption Archive App

A desktop application for \*\*securely encrypting and managing files and folders\*\*, built with JavaFX and AES-GCM encryption. Designed with usability and security in mind, it provides a streamlined UI for organizing and securing sensitive data locally.

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## Features

- ✅ \*\*AES-GCM Encryption\*\* with layered keys

- 📦 \*\*Custom archive format\*\* with block-based file encryption

- 📁 \*\*Drag & drop file management\*\* using a JavaFX TreeTableView

- ✏️ \*\*Editable folders\*\* and inline renaming

- 💾 \*\*Easy drag & drop archive updates\*\*

- 📄 \*\*Encrypted metadata\*\* using JSON (`org.json`)

- 📚 \*\*Nested folder support\*\*

- 📂 \*\*Easy file importing/exporting

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## Encryption Details

- \*\*Two-tiered encryption\*\*:

- Hashed user password encrypts `key1/iv1`

- `key1/iv1` encrypts the file contents and dictionary

- \*\*Files are encrypted in blocks\*\* using `Cipher.update()` and `doFinal()`

- The \*\*dictionary (file/folder structure)\*\* is stored at the top of the archive:

- Serialized as minified JSON

- Preceded by a fixed-size `int` indicating its length

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## 🖥️ UI Highlights

- \*\*TreeTableView\*\*:

- Drag-and-drop from OS

- Internal folder reorganization

- Right-click context menu with delete and "Add Folder"

- \*\*Styled ChoiceBox\*\* acting as a button

- \*\*Android-style toast popup\*\* for transient notifications

- \*\*Password dialog\*\* for archive creation and access

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## 📦 File I/O

- Buffered file copying with `Files.newInputStream` and byte arrays

- Temporary file usage for secure intermediate storage

- Platform-compatible: tested on macOS and Windows

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## 📚 Libraries & Assets Used

### 🔧 Dependencies

| Library | Purpose |

|--------|---------|

| [`Bcrypt`]( (https://github.com/djmdjm/jBCrypt/blob/master/src/org/mindrot/jbcrypt/BCrypt.java) | Password hashing |

| [`Apache Commons IO`](https://commons.apache.org/proper/commons-io/) | File manipulation utilities |

| [`org.json`](https://github.com/stleary/JSON-java) | JSON serialization of metadata |

| [`svgSalamander`](https://github.com/blackears/svgSalamander) | SVG rendering within JavaFX via SwingNode |

| [`JavaFX`](https://openjfx.io/) | Main GUI framework |

### 🎨 Icons

- [Remix Icon](https://remixicon.com/) — for file, folder, and action icons

- [Google Material Design Icons](https://fonts.google.com/icons) — for UI controls and dialogs

\*All third-party assets are used under their respective licenses.\*