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**23XT58 - Java Programming Lab**

# **underLeaf**

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## **OVERVIEW:**

UnderLeaf is a simple Java tool that lets users hide private information inside pictures without changing the way they look. It can store text messages, documents, or even another image within a cover image, keeping the hidden content completely invisible to normal view. The tool is built using JavaFX, providing a clear and easy interface for both hiding and revealing information. It combines basic image processing with simple data handling to conceal information effectively.

## **KEY FEATURES:**

<b>Feature</b>	<b>Description</b>
<b>Message Encoding</b>	This feature allows the user to hide a secret text message inside an image file in a safe and simple way.
<b>Document Encoding</b>	This feature lets users hide a .txt file within a chosen cover image.
<b>Image-in-Image Encoding</b>	This option allows users to embed one image within another without affecting its visible features.
<b>Decoding Function</b>	This feature extracts the hidden text, file, or image from an encoded image with accuracy.
<b>Multiple Format Support</b>	The tool supports common image types such as PNG, JPG, JPEG, and BMP for both hiding and revealing data.
<b>Error Handling</b>	The tool displays clear and simple messages whenever an error occurs during encoding or decoding.

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## IMPLEMENTATION:

Module	Functionality
<b>Main</b>	This package starts the JavaFX application and loads all the necessary files and resources for the program to run.
<b>Controller</b>	This package manages user actions, such as button clicks and input selections, within the application window.
<b>Steganography.Logic</b>	This package handles the main process of hiding and revealing data during encoding and decoding.
<b>Steganography.Exceptions</b>	This package manages custom errors, including unsupported image types or failed operations, to ensure smooth functioning.
<b>Steganography.Modals</b>	This package displays alert boxes, messages, and status pop-ups to keep users informed about ongoing actions.
<b>Steganography.Types</b>	This package defines the data types and formats used for managing hidden information within the program.
<b>Resources</b>	This section stores layout files, CSS style sheets, and fonts that define the look and design of the application.

## CONCLUSION:

UnderLeaf is a simple and well-structured Java project that brings the concept of hiding data inside images into a practical desktop tool. It keeps information secure while maintaining a clean and easy-to-use design. The project clearly demonstrates the use of Java packages, JavaFX layout, image-based data processing in one unified system.