

Assignment 3 – Image Processing Toolkit (Streamlit + OpenCV)

■ Objective

To design and implement a GUI-based Image Processing Toolkit in Python using Streamlit and OpenCV. This application demonstrates image operations such as color conversions, transformations, filtering, enhancement, edge detection, and compression with an interactive interface.

■ Code Implementation (app.py)

Below is the full Python code used for the GUI toolkit:

```
import streamlit as st
import cv2
import numpy as np
from PIL import Image
import io
import os
import tempfile

# ... (full code continues as in app.py) ...
```

■ Notes

This project integrates concepts from Module 1 – Image Processing Fundamentals & Computer Vision. It demonstrates color space conversions, image transformations, filtering, morphological operations, histogram equalization, sharpening, and edge detection. It also supports image compression and saving in different formats (JPG, PNG, BMP).

■ Deliverables

1. Codebase: app.py (Streamlit GUI app) 2. Notebook: ImageToolkit_.ipynb 3. Report (this PDF) 4. Final Demo: Interactive Streamlit GUI

This report is auto-generated from the Streamlit project code.