Date: 21-11-2021

Experiment 10

Aim: To generate Graphical User Interfaces (GUI) in MATLAB.

Apparatus: MATLAB Software

Objective: To learn the basic elements of the MATLAB GUIs.

CODE

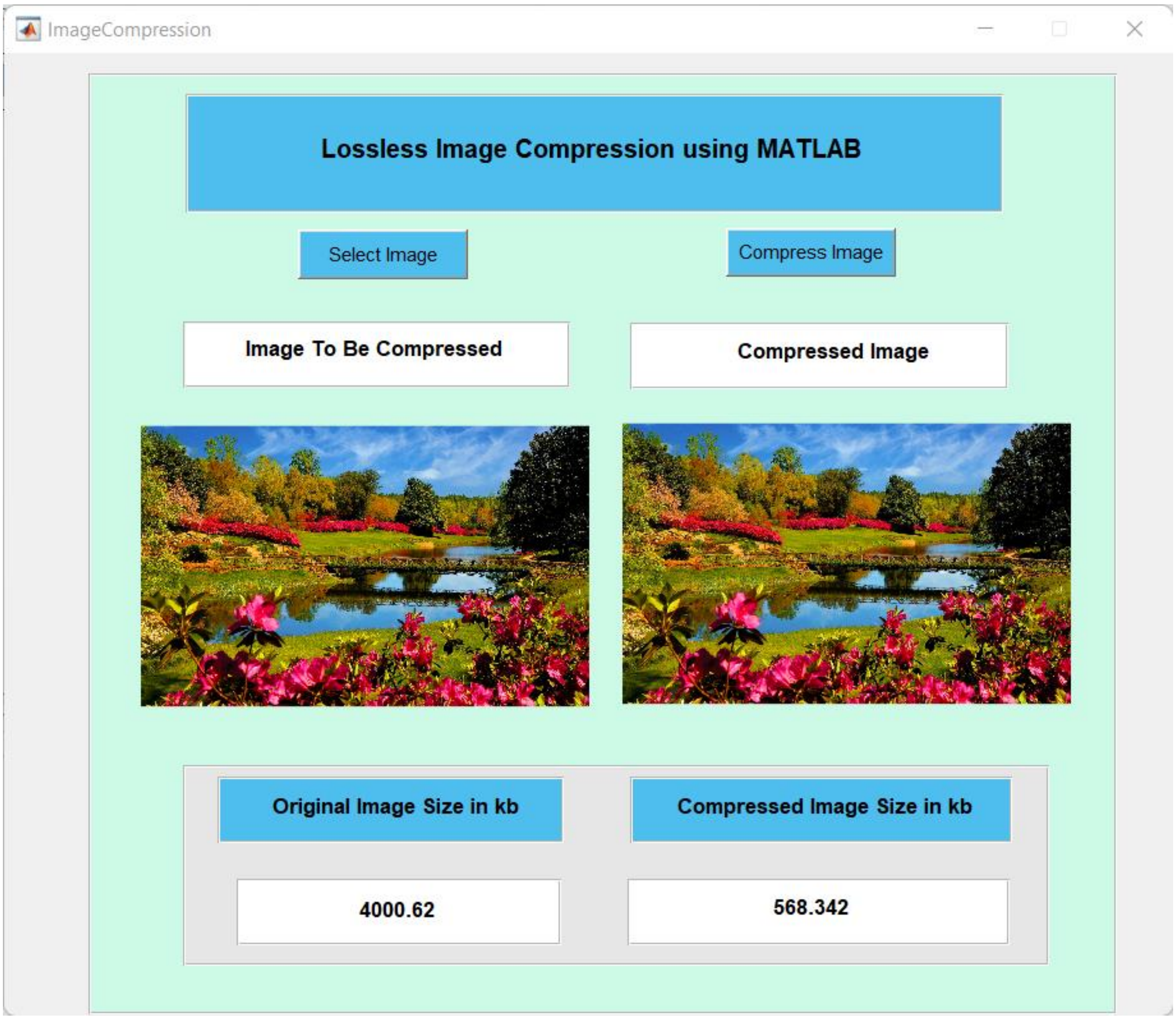
```
function varargout = ImageCompression(varargin)

%GUI formation
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn',
@ImageCompression_OpeningFcn, ...
                   'gui_OutputFcn',
@ImageCompression_OutputFcn, ...
                   'gui_LayoutFcn',  [] , ...
                   'gui_Callback',   []);

if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State,
varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
```

```
function ImageCompression_OpeningFcn(hobj, event, handle, varargin)

handle.output = hobj;

guidata(hobj, handle);
guidata(hobj, handle);

set(handle.axes3,'visible','off')
set(handle.axes4,'visible','off')

axis off
axis off

function varargout = ImageCompression_OutputFcn(hobj, event, handle)

varargout{1} = handle.output;


function pushbutton1_Callback(hobj, event, handle)

global file_name;

%the program is sufficient to work with all types of extension
file_name=uigetfile({'*.bmp;*.jpg;*.png;*.tiff;';'*.*'},'Select an Image File');
fileinfo = dir(file_name);
SIZE = fileinfo.bytes;
Size = SIZE/1024;

%displaying current size in the GUI
set(handle.text7,'string',Size);

imshow(file_name,'Parent', handle.axes3)


function pushbutton2_Callback(hobj, event, handle)

global file_name;
if(~ischar(file_name))
```

```matlab
       errordlg('Please select Images first');
    else
        I1 = imread(file_name);

        %masking the 1st frame
        I = I1(:,:,1);
        I = im2double(I);
        %Discrete cosine transform matrix
        T = dctmtx(8);
        B = blkproc(I,[8 8],'P1*x*P2',T,T');
        mask = [1   1   1   1   0   0   0   0
                1   1   1   0   0   0   0   0
                1   1   0   0   0   0   0   0
                1   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0];
        B2 = blkproc(B,[8 8],'P1.*x',mask);
        I2 = blkproc(B2,[8 8],'P1*x*P2',T',T);

        %masking the 2nd frame
        I = I1(:,:,2);
        I = im2double(I);
        T = dctmtx(8);
        B = blkproc(I,[8 8],'P1*x*P2',T,T');
        mask = [1   1   1   1   0   0   0   0
                1   1   1   0   0   0   0   0
                1   1   0   0   0   0   0   0
                1   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0];
        B2 = blkproc(B,[8 8],'P1.*x',mask);
        I3 = blkproc(B2,[8 8],'P1*x*P2',T',T);

        %masking the 3rd frame
        I = I1(:,:,3);
        I = im2double(I);
        T = dctmtx(8);
        B = blkproc(I,[8 8],'P1*x*P2',T,T');
        mask = [1   1   1   1   0   0   0   0
                1   1   1   0   0   0   0   0
                1   1   0   0   0   0   0   0
                1   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0
                0   0   0   0   0   0   0   0];
        B2 = blkproc(B,[8 8],'P1.*x',mask);
        I4 = blkproc(B2,[8 8],'P1*x*P2',T',T);

        %concatinating all 3 frames
        L(:,:,:)=cat(3,I2, I3, I4);
        %writing into the file
        imwrite(L,'CompressedColourImage.jpg');

        fileinfo = dir('CompressedColourImage.jpg');

        SIZE = fileinfo.bytes;
        Size = SIZE/1024;

        %displaying in the gui

        set(handle.text8,'string',Size);
        imshow(L,'Parent', handle.axes4)
    end
```

OUTUT

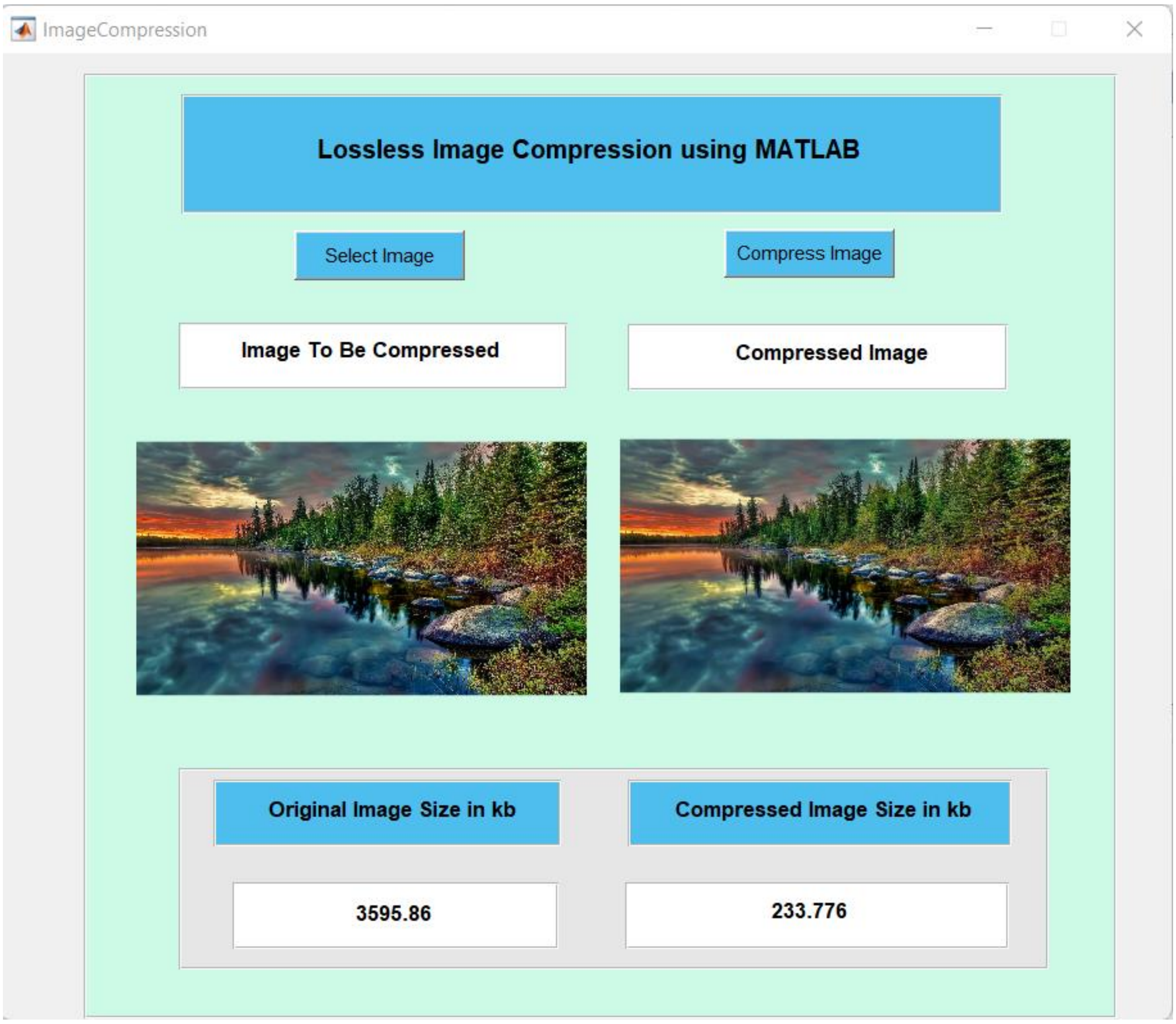
JPG



Original Image Size in kb: 4000.62

Compressed Image Size in kb: 568.342

PNG



ImageCompression

Lossless Image Compression using MATLAB

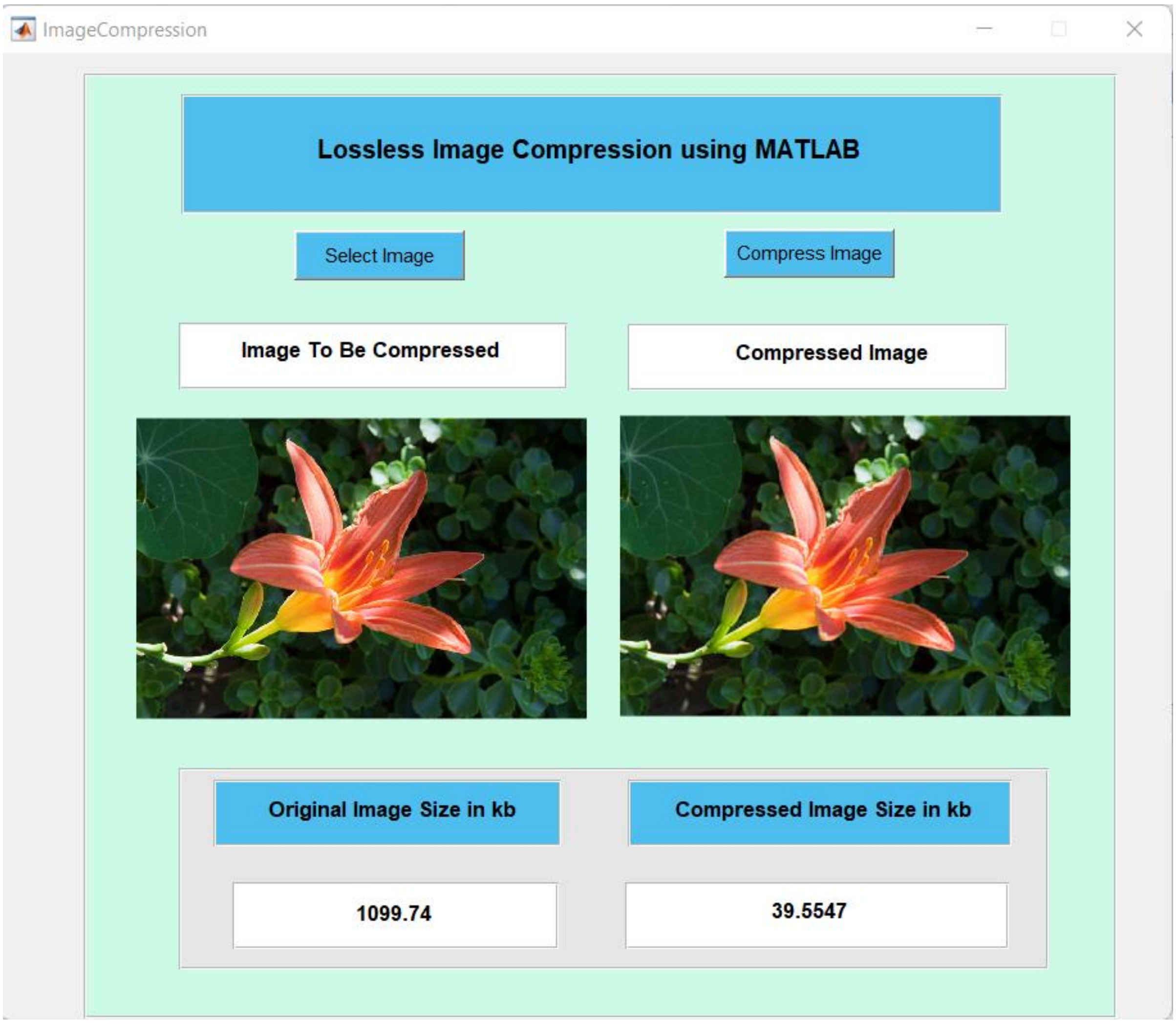
Image To Be Compressed

Compressed Image

Original Image Size in kb: 3595.86

Compressed Image Size in kb: 233.776

BMP



Original Image Size in kb: 1099.74

Compressed Image Size in kb: 39.5547

TIFF

Original:

Compressed: