UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

SESI 2020/2021 SEMESTER 1

SCSV3213 – SECTION 2

FUNDAMENTAL OF IMAGE PROCESSING

Lecturer: Dr. Md. Sah bin Hj. Salam

ASSIGNMENT 2

Image Enhancement in Spatial Domain

Team members:

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Code:

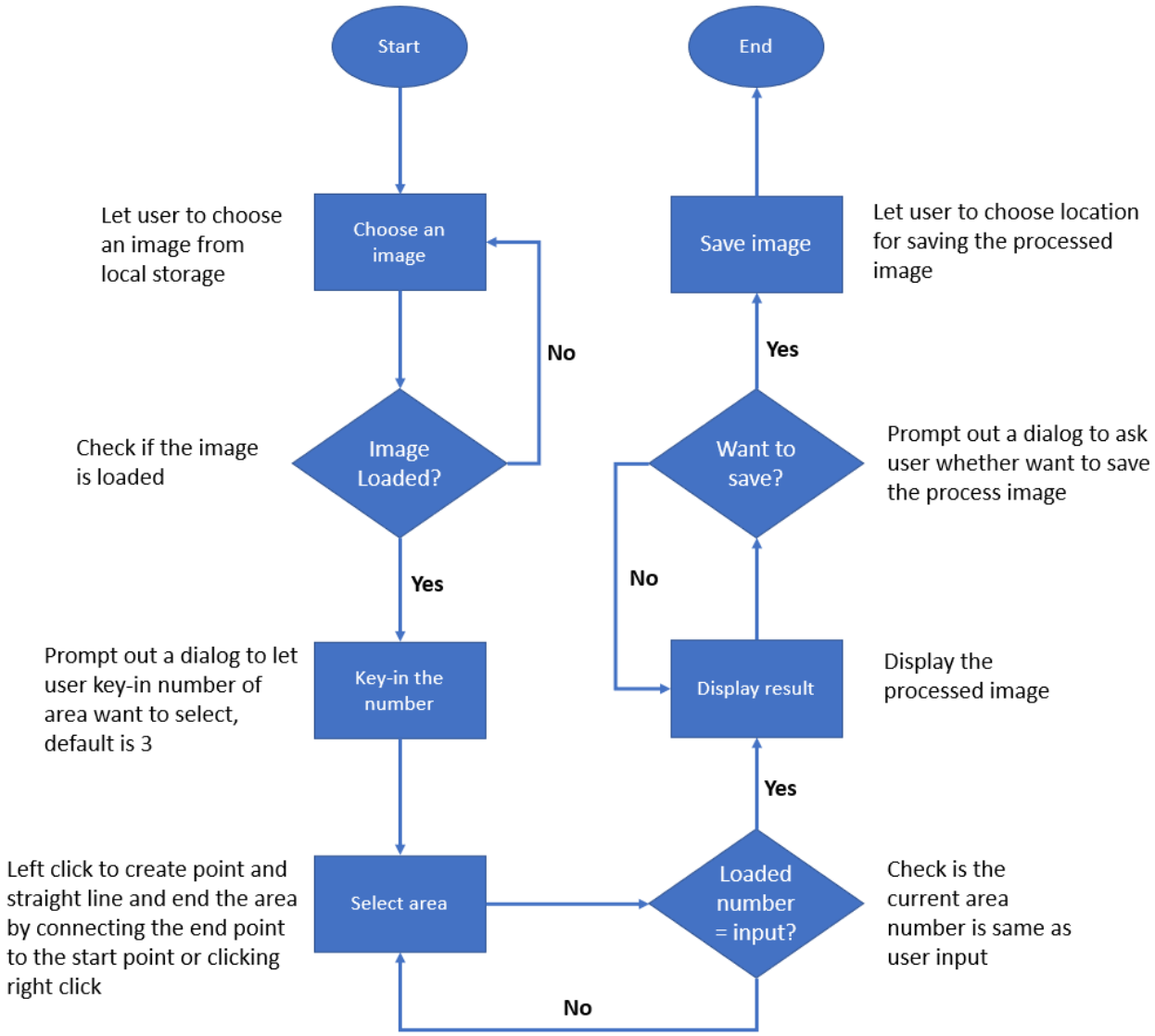
```
classdef Simon_app < matlab.apps.AppBase

    % Properties that correspond to app components
    properties (Access = public)
        UIFigure                    matlab.ui.Figure
        Image                       matlab.ui.control.Image
        ClickthephotobelowtochooseanewimagefromyourcomputerLabel
matlab.ui.control.Label
        ClicktoselectimageButton  matlab.ui.control.Button
        developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel
matlab.ui.control.Label
        Label                       matlab.ui.control.Label
    end

    methods (Access = private)

        function updateimage(~,PickedImage)
            A=imread(PickedImage); %imread() is reads image from local folder
            avg = ones(60) /30^2; %creats a  60x60 matrix with value 0.0011 to
blur the image
            A_adj = imdivide(A,15); %imdivide() is creates a darker pixel
            counter = 0;
            c_bw = 0;
            prompt = 'How many area you want to select? ';
            input = inputdlg(prompt, 'Enter a value' , 1, {num2str(3)});
            while counter < str2double(input)
                bw = im2uint8(roipoly(A)); %im2uint8() is converts the grayscale,
RGB, or binary image I to uint8, rescaling or offsetting the data as necessary.
                %roipoly() is creates an interactive polygon tool associated with
the image displayed in the current figure.
                counter = counter + 1 ;
                c_bw = bitor(c_bw, bw);
            end
            bw_cmp = bitcmp(c_bw); %returns the bit-wise complement of bw
            roi = bitor(A_adj, bw_cmp); %returns the bit-wise OR of _adj & bw_cmp,
cutted image
            not_roi = bitor(A, c_bw); %remaining of cut image
            filtered = imfilter(roi, avg, 'conv'); %imfilter() uses convolution
to blur the selected area
            new_img = bitand(not_roi, filtered); %display the image by layers
into a single image
            imshow(new_img); %display the result
            promptMessage = sprintf('Sucessfully! Do you want to save?');
            button = questdlg(promptMessage, 'Processed Result', 'No', 'Yes',
'Yes');
            if strcmpi(button, 'Yes')
                  imsave();
```

```
            end
        end
    end


    % Callbacks that handle component events
    methods (Access = private)


        % Image clicked function: Image
        function ImageClicked(app, event)

        end


        % Button pushed function: ClicktoselectimageButton
        function ClicktoselectimageButtonPushed(app, event)
            % Display uigetfile dialog
            filterspec = {'*.jpg;*.tif;*.png;*.gif;*.jpeg','All Image Files'};
            [f, p] = uigetfile(filterspec);

            % Make sure user didn't cancel uigetfile dialog
            if (ischar(p))
                fname = [p f];
                updateimage(app, fname);
            end
        end
    end


    % Component initialization
    methods (Access = private)


        % Create UIFigure and components
        function createComponents(app)


            % Create UIFigure and hide until all components are created
            app.UIFigure = uifigure('Visible', 'off');
            app.UIFigure.Position = [100 100 1273 718];
            app.UIFigure.Name = 'UI Figure';


            % Create Image
            app.Image = uiimage(app.UIFigure);
            app.Image.ImageClickedFcn = createCallbackFcn(app, @ImageClicked,
true);
            app.Image.Position = [-73 1 1416 718];
            app.Image.ImageSource = 'dawn.jpg';
```

```
            % Create ClickthephotobelowtochooseanewimagefromyourcomputerLabel
            app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel =
uilabel(app.UIFigure);
            app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel.FontSize
= 20;

app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel.FontWeight = 'bold';

app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel.FontColor = [1 1 1];
            app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel.Position
= [20 22 573 25];
            app.ClickthephotobelowtochooseanewimagefromyourcomputerLabel.Text =
'Click the photo to select a new image from your computer.';


            % Create ClicktoselectimageButton
            app.ClicktoselectimageButton = uibutton(app.UIFigure, 'push');
            app.ClicktoselectimageButton.ButtonPushedFcn = createCallbackFcn(app,
@ClicktoselectimageButtonPushed, true);
            app.ClicktoselectimageButton.Icon = 'IMG_20200814_200954-01-01.jpeg';
            app.ClicktoselectimageButton.IconAlignment = 'top';
            app.ClicktoselectimageButton.BackgroundColor = [0.651 0.651 0.651];
            app.ClicktoselectimageButton.FontWeight = 'bold';
            app.ClicktoselectimageButton.FontColor = [0 0 1];
            app.ClicktoselectimageButton.Position = [39 71 119 183];
            app.ClicktoselectimageButton.Text = {'Click to '; 'select image'};


            % Create developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel
            app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel =
uilabel(app.UIFigure);
            app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel.FontName
= 'Ink Free';
            app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel.FontSize
= 30;

app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel.FontWeight = 'bold';
            app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel.Position
= [546 505 290 190];
            app.developedbySimonChongKaiYuenCliveLaiYiChengNgShuYuLabel.Text =
{'developed by:'; ''; 'Simon Chong Kai Yuen'; 'Clive Lai Yi Cheng'; 'Ng Shu Yu'};


            % Create Label
            app.Label = uilabel(app.UIFigure);
            app.Label.FontName = 'Giddyup Std';
            app.Label.FontSize = 40;
            app.Label.FontColor = [1 1 1];
```

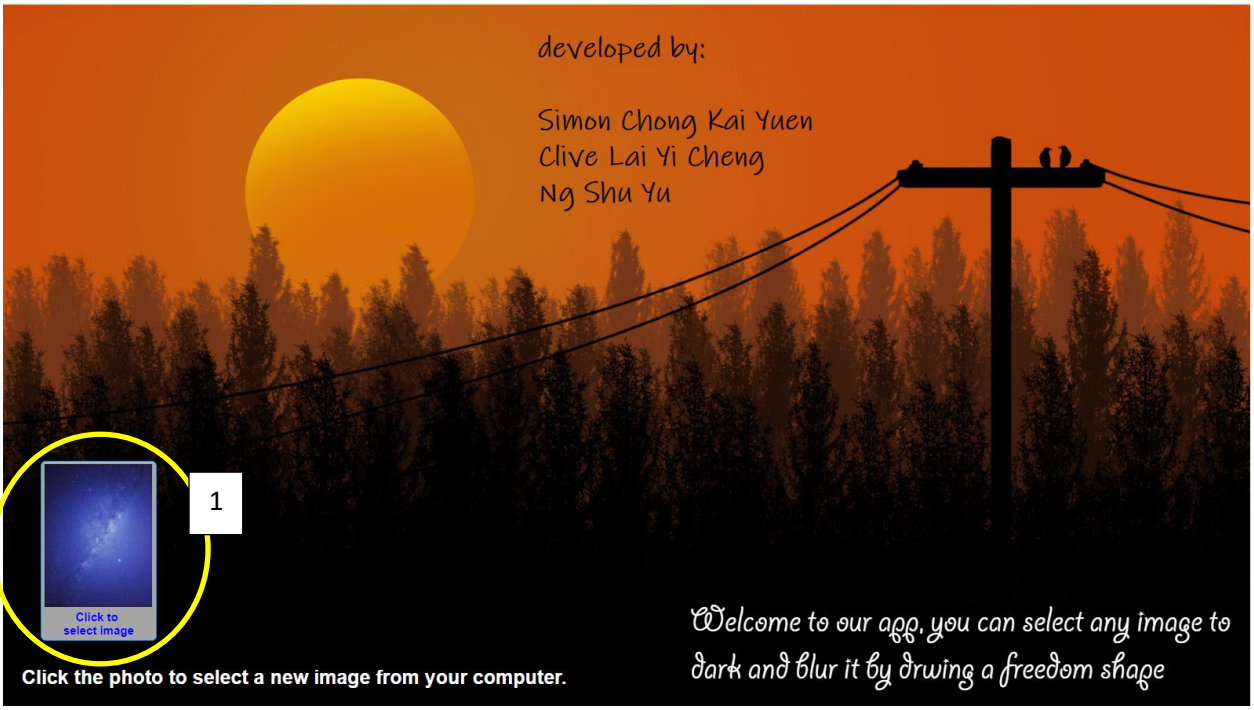
```
            app.Label.Position = [702 1 1140 123];
            app.Label.Text = {'Welcome to our app, you can select any image to ';
'dark and blur it by drwing a freedom shape'};


            % Show the figure after all components are created
            app.UIFigure.Visible = 'on';
        end
    end


    % App creation and deletion
    methods (Access = public)


        % Construct app
        function app = Simon_app


            % Create UIFigure and components
            createComponents(app)


            % Register the app with App Designer
            registerApp(app, app.UIFigure)


            if nargout == 0
                clear app
            end
        end


        % Code that executes before app deletion
        function delete(app)


            % Delete UIFigure when app is deleted
            delete(app.UIFigure)
        end
    end
end
```

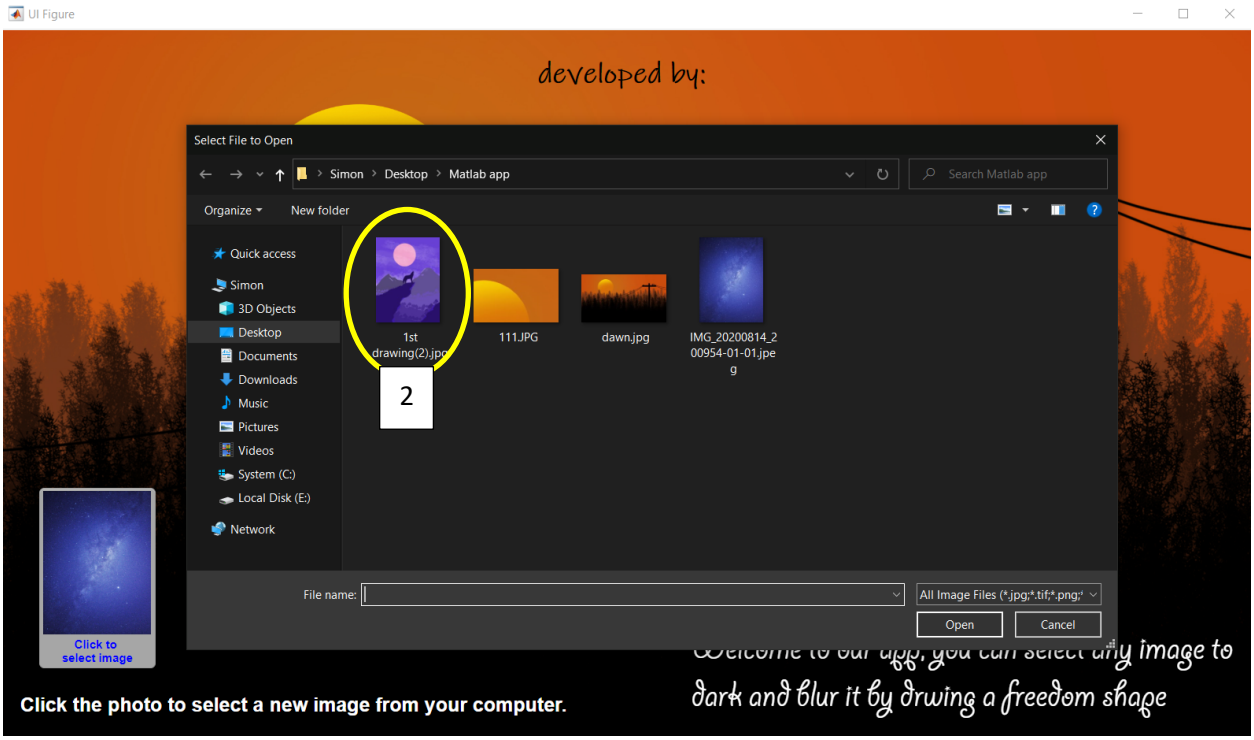
Flow Chart in showing the process in achieving the task and its description.



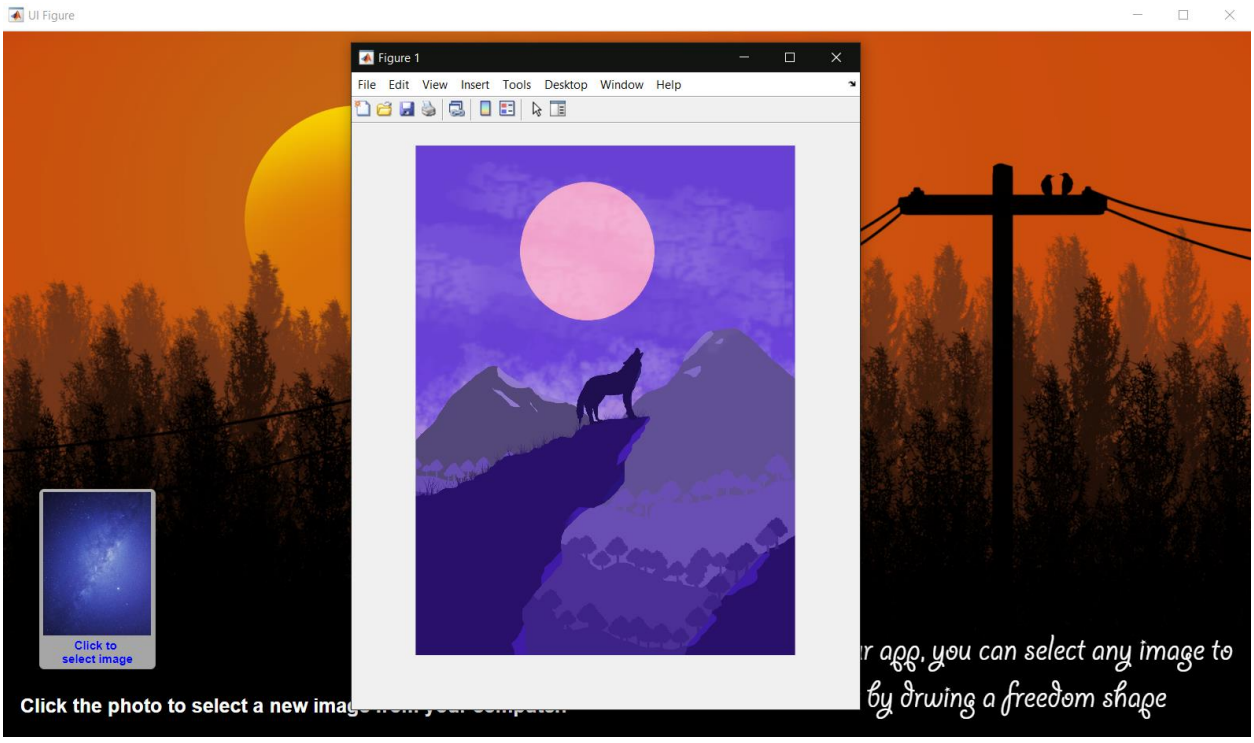
Example of the image and output.

All the background image, icon picture at bottom left and the demonstration input image are taken/designed/illustrated/drawn by Simon






developed by:
Simon Chong Kai Yuen
Clive Lai Yi Cheng
Ng Shu Yu
3
How many area you want to select?
OK
Cancel
Click to select image
Click the photo to select a new image from your computer.
Welcome to our app, you can select any image to dark and blur it by drwing a freedom shape


UI Figure
Figure 1
File Edit View Insert Tools Desktop Window Help
Click to select image
Click the photo to select a new image from your computer.
r app, you can select any image to
by drwing a freedom shape

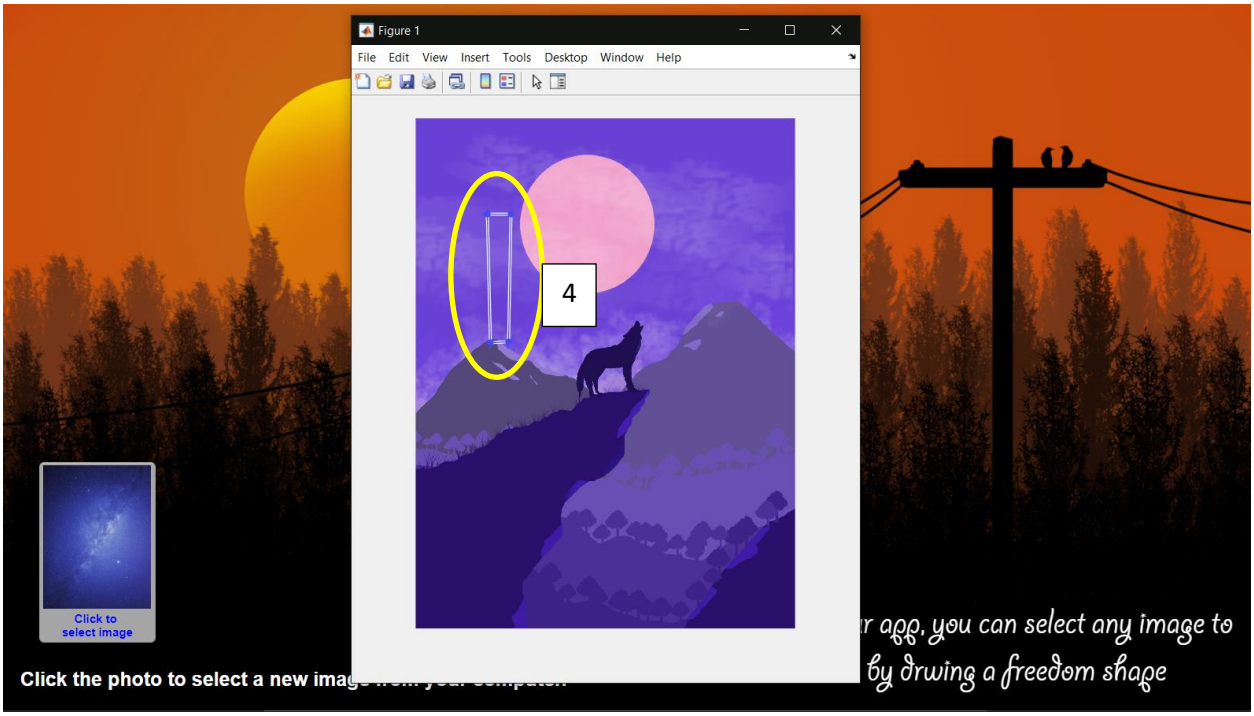
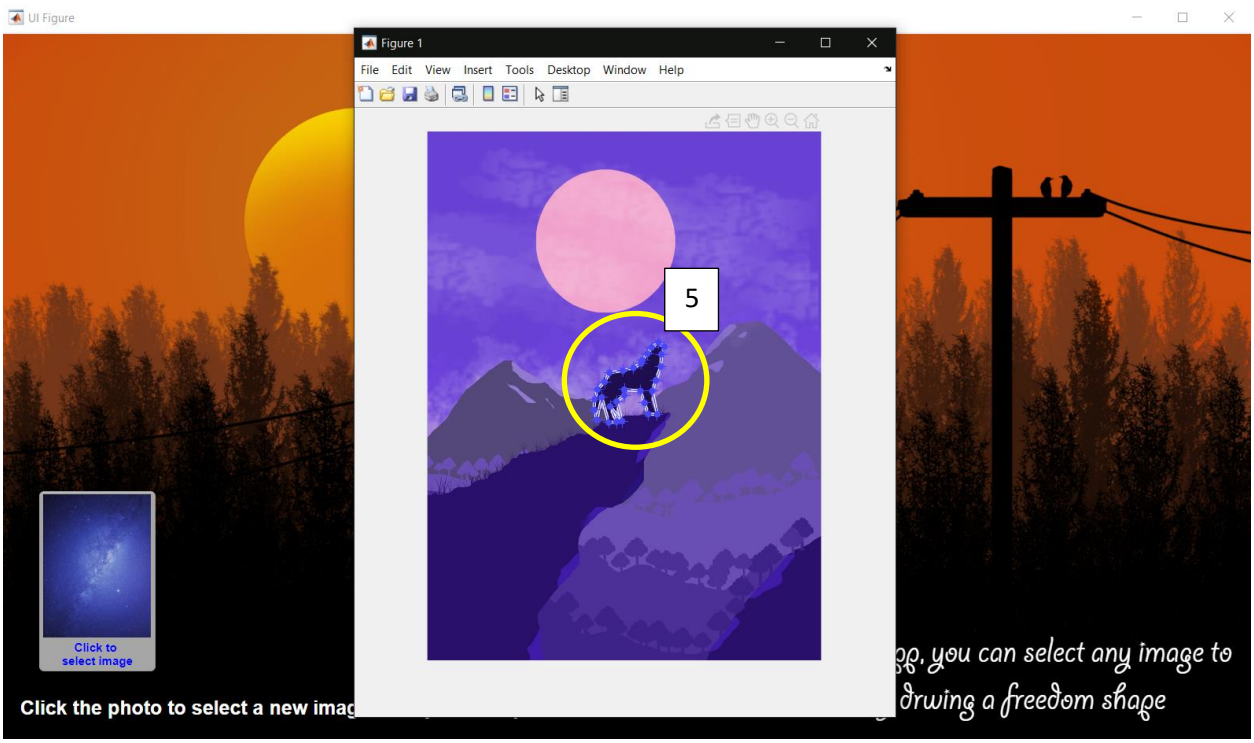


Figure 1
File Edit View Insert Tools Desktop Window Help
4
Click to select image
Click the photo to select a new image
r app, you can select any image to
by drwing a freedom shape


UI Figure
Figure 1
File Edit View Insert Tools Desktop Window Help
5
Click to select image
Click the photo to select a new imag
pp, you can select any image to
drwing a freedom shape

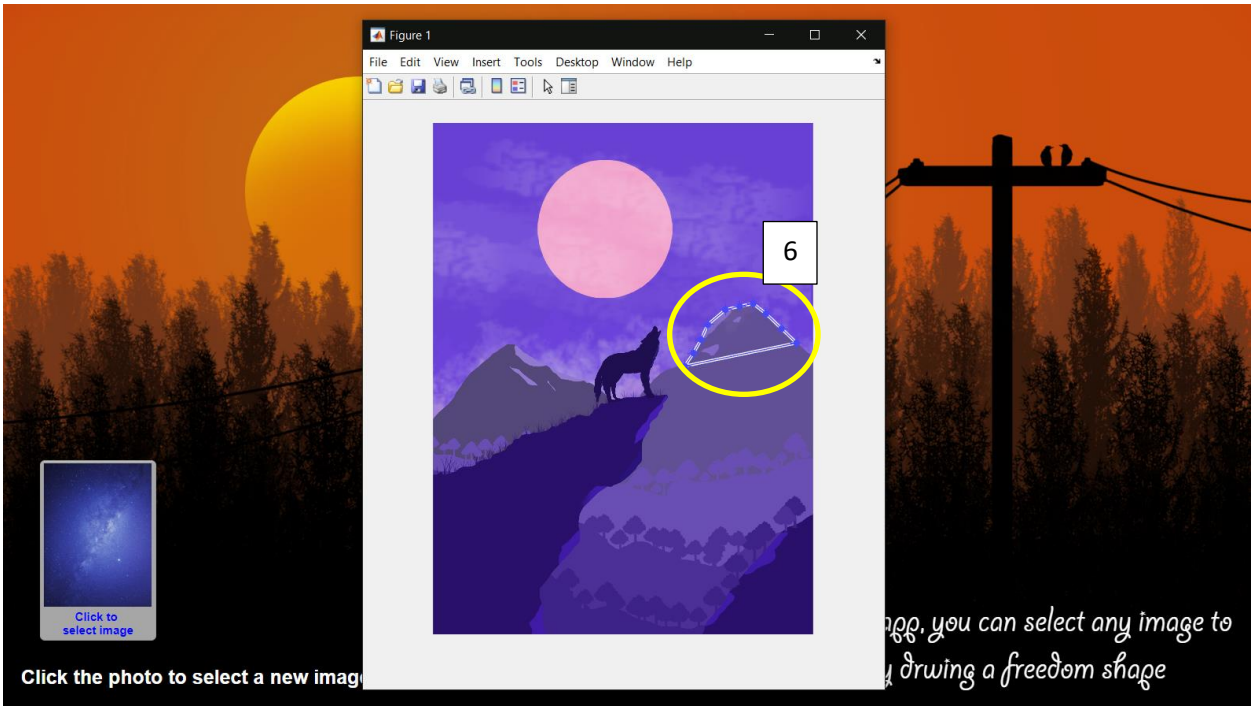


Figure 1
File Edit View Insert Tools Desktop Window Help
6
Click to select image
Click the photo to select a new imag
app, you can select any image to
drwing a freedom shape

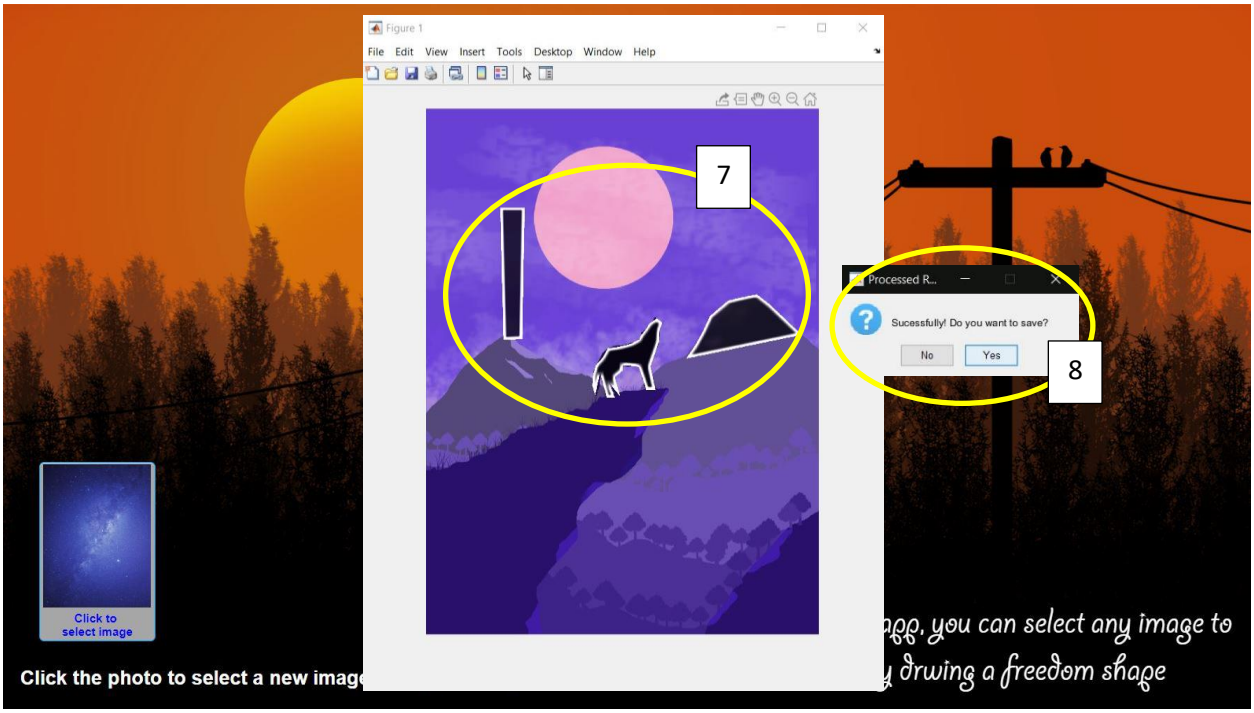
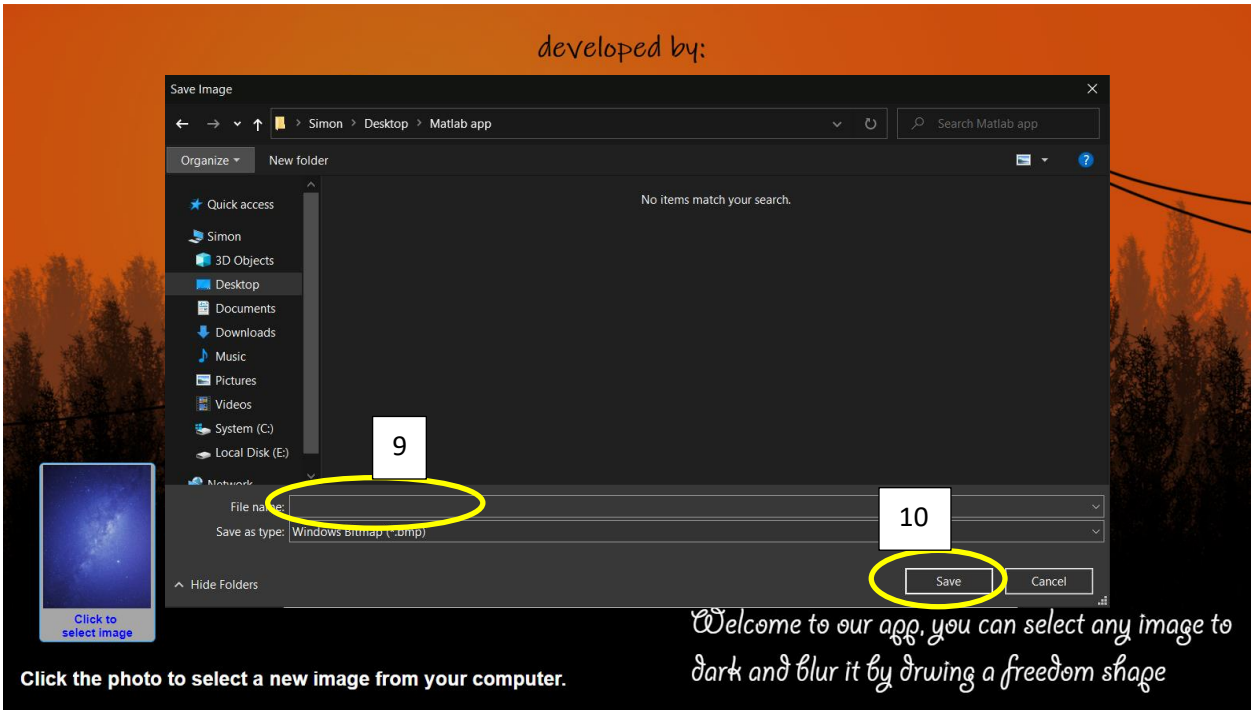


Figure 1
File Edit View Insert Tools Desktop Window Help
7
Processed R...
Sucessfully! Do you want to save?
No
Yes
8
Click to select image
Click the photo to select a new imag
app, you can select any image to
drwing a freedom shape


developed by:
Save Image
Simon
Desktop
Matlab app
Search Matlab app
Organize
New folder
Quick access
Simon
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
System (C:)
Local Disk (E:)
No items match your search.
9
10
File name:
Save as type:
Windows Bitmap (*.bmp)
Hide Folders
Save
Cancel
Click to select image
Click the photo to select a new image from your computer.
Welcome to our app, you can select any image to dark and blur it by drwing a freedom shape


Input


Output