

**University of the Punjab**  
**Gujranwala Campus**  
**Department of Information Technology**



**Computer Vision**  
**Assignment**

**Submitted by:**

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**Section: BSIT (Morning)**

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**Submitted to:**

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## EXERCISE:

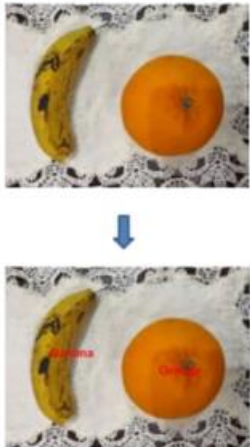
Image Representation

**Exercise – Identification & Labelling**

  
**16**

Create a picture of at least two different fruits or vegetables available at your home. Use this picture and names of items in this picture as the input of code which can do the following:

- Identify the items in picture and label accordingly.
- Test your code on more than two types of fruits/vegetables for the bonus marks.



## SOLUTION:

```
clc; clear; close all;
```

```
% Load Image
```

```
img = imread('image.png'); % Ensure correct image
```

```
figure, imshow(img), title('Original Image');
```

```
% Convert to HSV Color Space
```

```
hsvImg = rgb2hsv(img);
```

```
hue = hsvImg(:,:,1);
```

```
% Define Color Ranges
```

```
bananaMask = (hue > 0.10 & hue < 0.20); % Yellow range for banana
```

```
orangeMask = (hue > 0.02 & hue < 0.08); % Orange range for orange
```

**% Remove Small Objects**

```
bananaMask = bwareaopen(bananaMask, 1500);
```

```
orangeMask = bwareaopen(orangeMask, 1500);
```

**% Get Properties of Detected Objects**

```
bananaProps = regionprops(bananaMask, 'BoundingBox', 'Centroid', 'Area');
```

```
orangeProps = regionprops(orangeMask, 'BoundingBox', 'Centroid', 'Area');
```

**% Display Image**

```
figure, imshow(img), title('Correctly Labeled Image');
```

```
hold on;
```

**% Label Banana**

```
if ~isempty(bananaProps)
```

```
    [~, idx] = max([bananaProps.Area]); % Select largest banana
```

```
    bananaCentroid = bananaProps(idx).Centroid;
```

```
    text(bananaCentroid(1), bananaCentroid(2) + 20, 'Banana', ...
```

```
        'Color', 'r', 'FontSize', 14, 'FontWeight', 'bold', 'HorizontalAlignment', 'center');
```

```
end
```

**% Label Orange**

```
if ~isempty(orangeProps)
```

```
    [~, idx] = max([orangeProps.Area]); % Select largest orange
```

```
    orangeCentroid = orangeProps(idx).Centroid;
```

```
    text(orangeCentroid(1), orangeCentroid(2) + 20, 'Orange', ...
```

```
        'Color', 'r', 'FontSize', 14, 'FontWeight', 'bold', 'HorizontalAlignment', 'center');
```

```
end
```

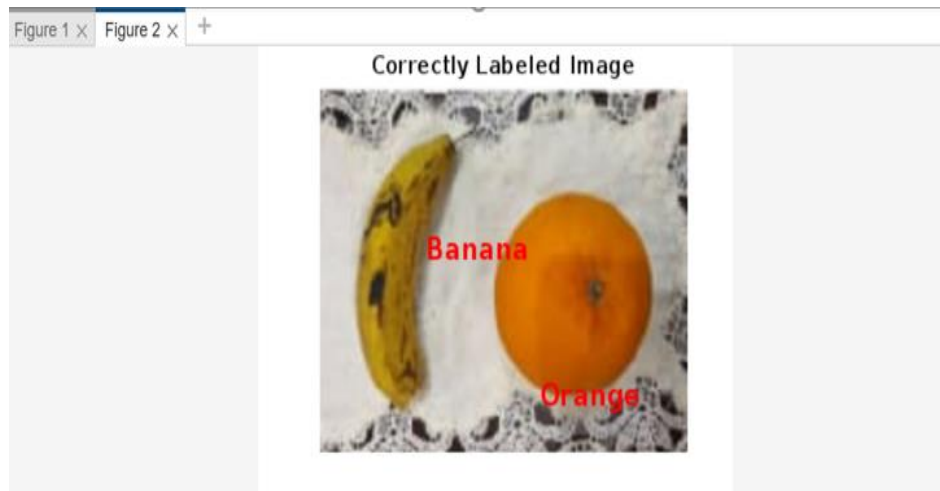
```
hold off;
```

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## MATLAB SREENSHOTS:



**Figure# 1**



**Figure# 2**