Image Processing
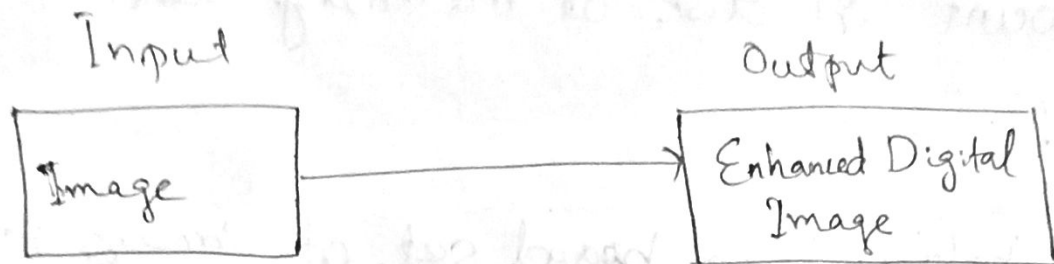
Input

Output

Image → Enhanced Digital Image

Image Processing is the process of transform an image into a digital form & performing certain operations to get some useful information from it. The image processing system usually treats all images as 2D signal when applying certain predeterm signal processing methods.

→ Filtering:

Image filtering is changing the appearance of an image by altering the colors of the pixels. Increasing the contrast as well as adding a variety of special effects to images are some o the results of applying filters.

→ Compression:

Image compression is a process applied to graphics file to minimize it's size in bytes without degrading image quality below an

acceptable threshold. By reducing the file size, more images can be stored in a given amount of disk or memory space.

→ **Morphology**

Morphology is a broad set of image processing operations the processing operations that process images based on shapes. Morphological operations apply a structing element to an input image, creating an output image of the same size.

→ **Edge Detection**

Edge detection is a technique of image processing used to identify points in a digital image with discontinuities, simply to say, sharp changes in the image brightness. These points where the image brightness varies sharply are called the edges (or boundaries) of the image.

→ **Contrast Stretching**

A process that transforms the intensity values of an image to a new range, usually [0-255]

for 8-bit images. The goal is to increase the contrast b/w the darkest & brightest pixels, while preserving the relative differences among the intermediate values.

→ **Image Enhancement**

The process of adjusting digital images so that results are more suitable for display or further image analysis. For example you can remove noise, sharpen, or brighten an image, making it easier to identify key features.

→ **Image Histogram**

A type of histogram that acts as a graphical representation of the tonal distribution in digital image. It plots the no. of pixels for each tonal values. By looking at the histogram for a specific image a viewer will able to judge the entire tonal distribution at a glance.

→ **Histogram Equalization**

A method to process images in order to adjust the contrast of image by modifying

the intensity distribution of the histogram. The objective of this technique is to give a linear trend to cumulative probability function associated to the image.

→ **Water marking**

Use of a kind of marker covertly embedded in a digital media such as audio, video or image which enables us to know the source or owner of the copyright. It is a process of superimposing a logo or piece of text atopa document or image file.

→ **Transformation.**

An image transform can be applied to an image to convert it from one domain to another viewing an image.

Steps:
→ Image restoration
→ Image reconstruction
→ Image super resolution.