# PS1-3: Gamma Correction:

## CODE:

```
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"""
#C:/Users/parth/OneDrive/Desktop//smiley.jpg
#C:/Users/parth/OneDrive/Desktop/CMU Lecture Files/CV for Engineers//carnival.jpg
import cv2
import numpy as np

img1 = input('Enter an image: ')    #Input Image
img = cv2.imread(img1)              #Read Image

print(img.shape)
g = float(input('Enter a gamma value: '))  #Enter the desired Gamma Value

def gamma_c(src, gamma):
    invGamma = 1.0 / g    #Gamma Inverse
    #make a table to traverse over all pixel values, scale them to [0,1], apply gamma inverse
    #Scale it back to original
    t = np.array([((i / 255.0) ** invGamma) * 255) for i in np.arange(0, 256)]).astype("uint8")
    print(t.shape)
    return cv2.LUT(img, t) #Create a look up table to link each pixel value to its corresponding gamma corrected value
scale_percent = 75 #Resize the image to fit the screen
width = int(img.shape[1] * scale_percent / 100)
height = int(img.shape[0] * scale_percent / 100)
dim = (width, height)

# resize image
original_resized = cv2.resize(img, dim, interpolation = cv2.INTER_AREA)
cv2.imshow('Carnival', original_resized) #Display Original Image

gammaImg = gamma_c(img, g )
scale_percent = 75 #Resize the image to fit the screen
width1 = int(gammaImg.shape[1] * scale_percent / 100)
height1 = int(gammaImg.shape[0] * scale_percent / 100)
dim = (width1, height1)

#resize image
original_resized_gamma = cv2.resize(gammaImg, dim, interpolation = cv2.INTER_AREA)

cv2.imshow('Gamma corrected image', original_resized_gamma) #Display the gamma corrected image
cv2.waitKey(0)
cv2.destroyAllWindows()
```

The given code is used to apply gamma correction to an image taken as input.

After accepting the gamma value, it is inverted and is used to resize each pixel of the input image to [0,1]. After scaling and applying the gamma value, it is rescaled and stored in an array called “t”.

A look up table is used to map each pixel of the original image to its gamma corrected value.

The Images are rescaled to fit the screen and the displayed.

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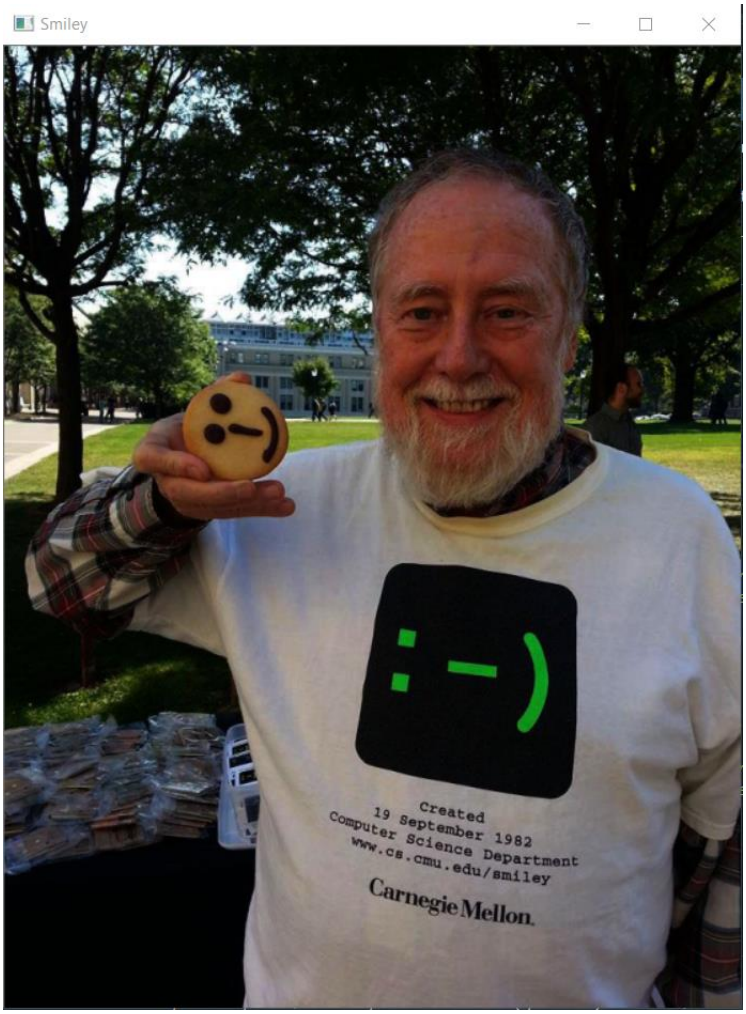
Image 1: Smiley.jpg

Original Image:



Gamma Corrected Image(Gamma: 2):

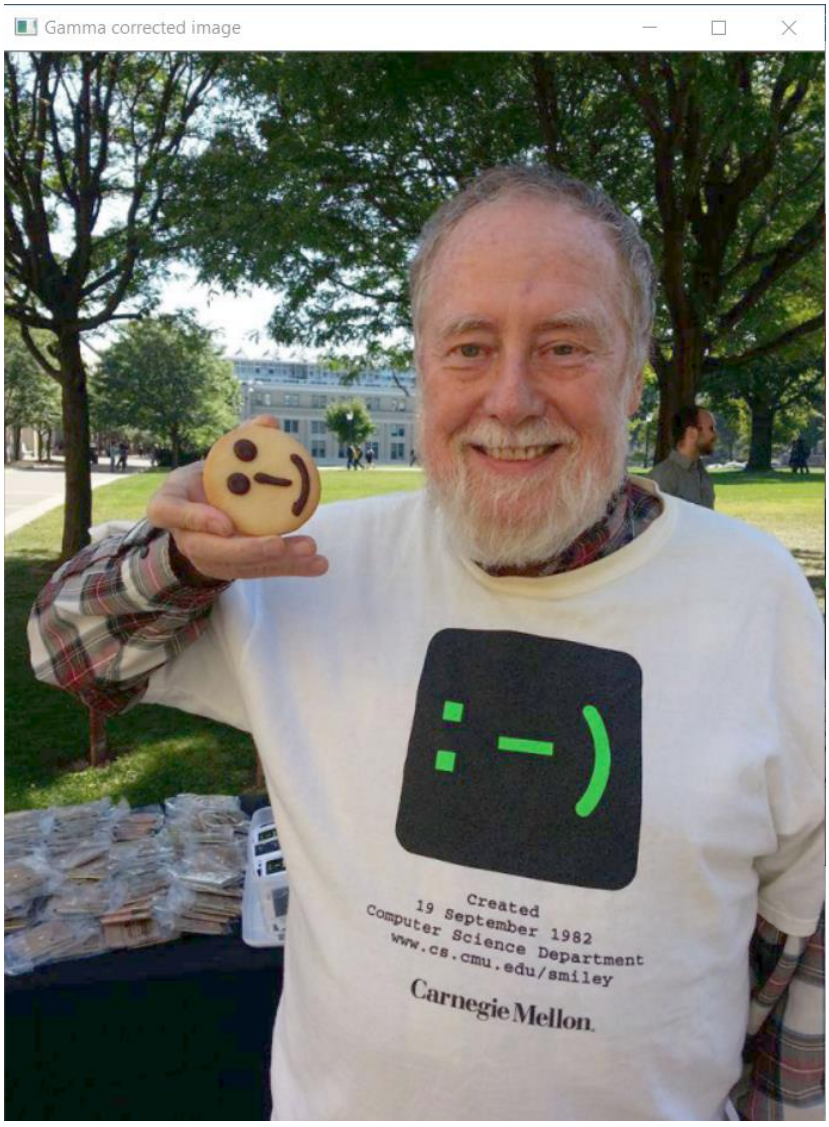


IMAGE 2: CARNIVAL.JPG

Original Image:

Gamma Corrected Image (Gamma= 0.2):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**Operating System:** Windows 10

**IDE used:**

For test runs: Jupyter Notebook

For original work with commenting: Spyder

**Number of Hours spent:** 6.5 Hours

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