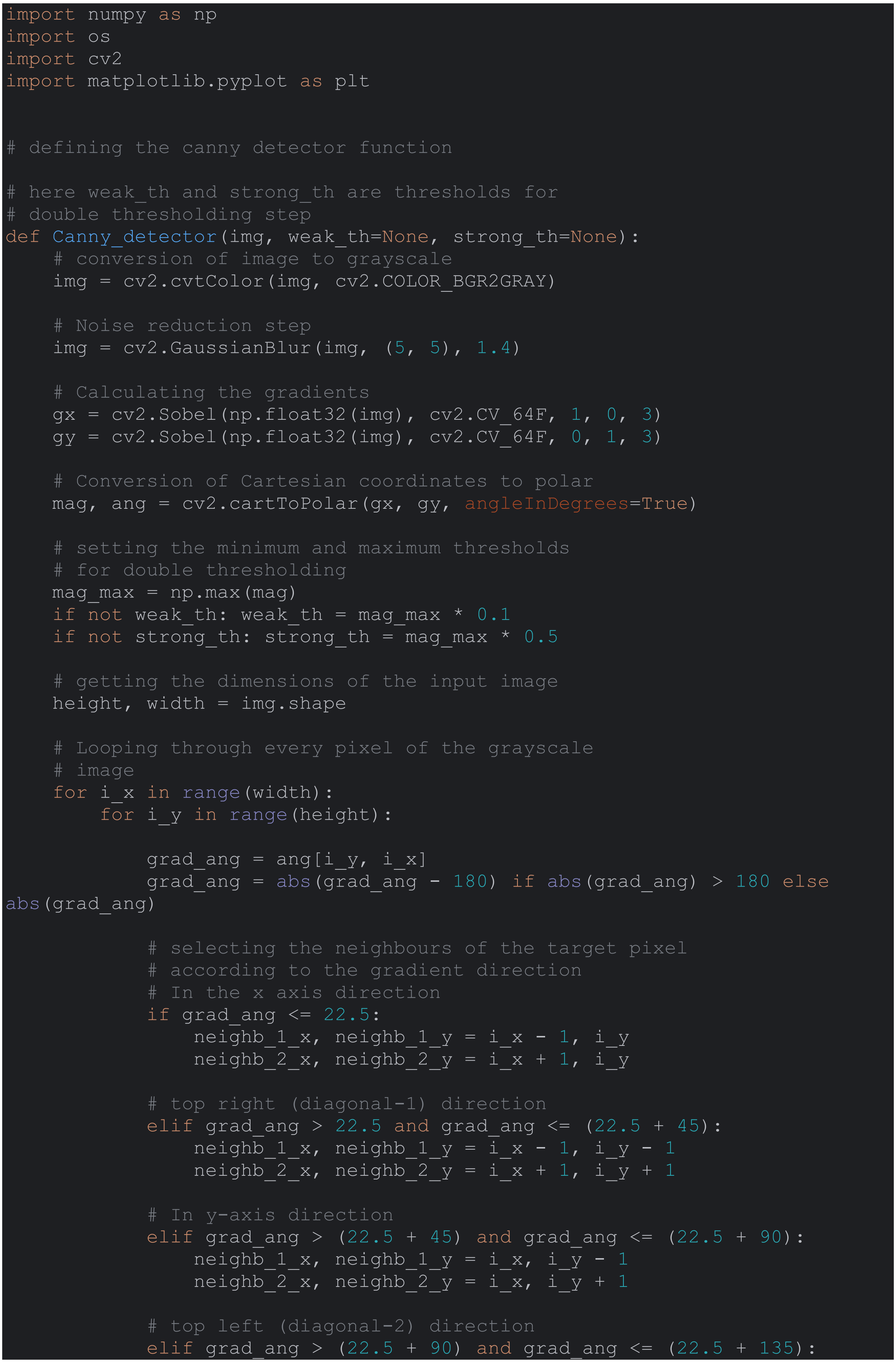
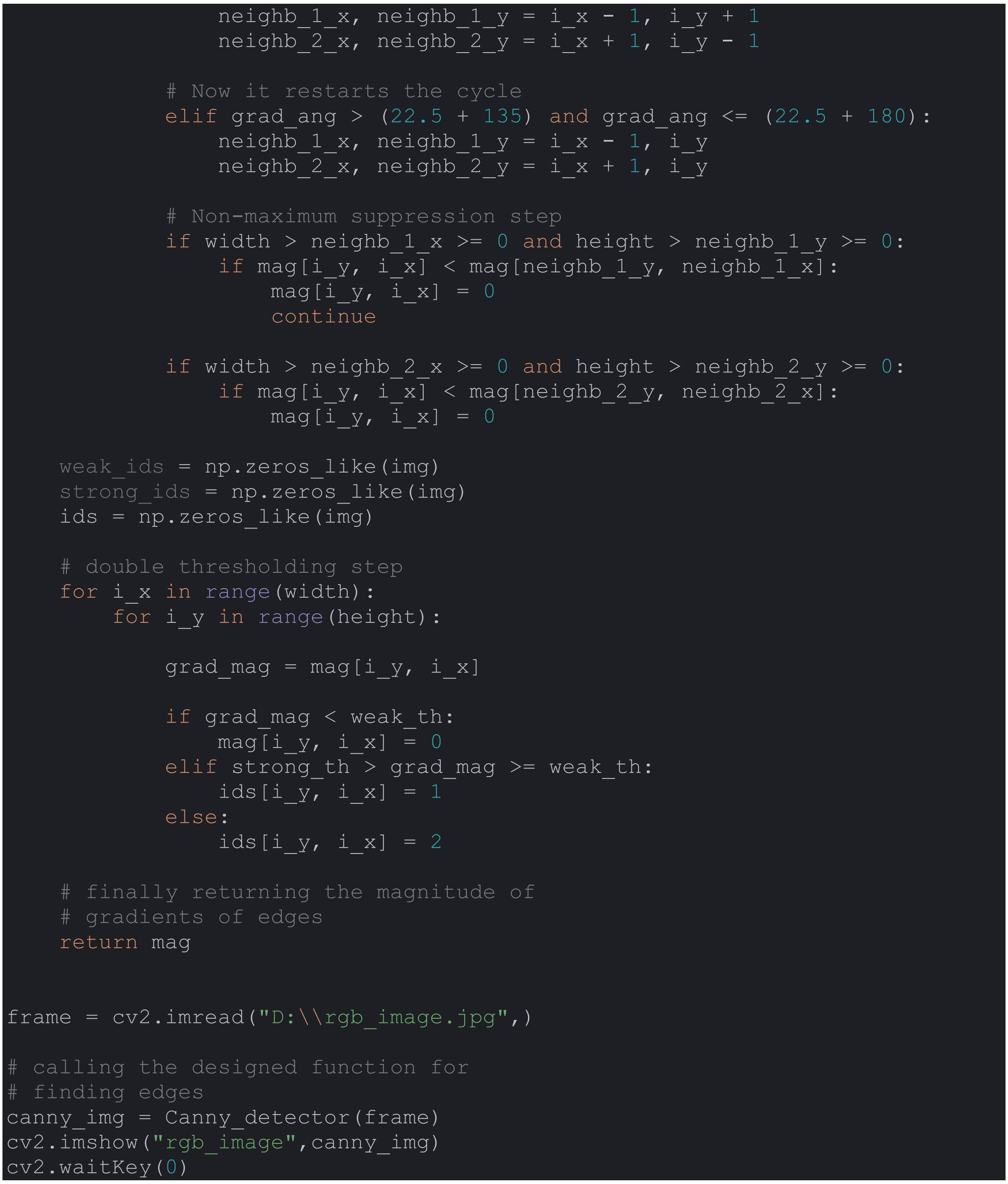


```
import numpy as np
import os
import cv2
import matplotlib.pyplot as plt


# defining the canny detector function

# here weak_th and strong_th are thresholds for
# double thresholding step
def Canny_detector(img, weak_th=None, strong_th=None):
    # conversion of image to grayscale
    img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

    # Noise reduction step
    img = cv2.GaussianBlur(img, (5, 5), 1.4)

    # Calculating the gradients
    gx = cv2.Sobel(np.float32(img), cv2.CV_64F, 1, 0, 3)
    gy = cv2.Sobel(np.float32(img), cv2.CV_64F, 0, 1, 3)

    # Conversion of Cartesian coordinates to polar
    mag, ang = cv2.cartToPolar(gx, gy, angleInDegrees=True)

    # setting the minimum and maximum thresholds
    # for double thresholding
    mag_max = np.max(mag)
    if not weak_th: weak_th = mag_max * 0.1
    if not strong_th: strong_th = mag_max * 0.5

    # getting the dimensions of the input image
    height, width = img.shape

    # Looping through every pixel of the grayscale
    # image
    for i_x in range(width):
        for i_y in range(height):

            grad_ang = ang[i_y, i_x]
            grad_ang = abs(grad_ang - 180) if abs(grad_ang) > 180 else
abs(grad_ang)

            # selecting the neighbours of the target pixel
            # according to the gradient direction
            # In the x axis direction
            if grad_ang <= 22.5:
                neighb_1_x, neighb_1_y = i_x - 1, i_y
                neighb_2_x, neighb_2_y = i_x + 1, i_y

            # top right (diagonal-1) direction
            elif grad_ang > 22.5 and grad_ang <= (22.5 + 45):
                neighb_1_x, neighb_1_y = i_x - 1, i_y - 1
                neighb_2_x, neighb_2_y = i_x + 1, i_y + 1

            # In y-axis direction
            elif grad_ang > (22.5 + 45) and grad_ang <= (22.5 + 90):
                neighb_1_x, neighb_1_y = i_x, i_y - 1
                neighb_2_x, neighb_2_y = i_x, i_y + 1

            # top left (diagonal-2) direction
            elif grad_ang > (22.5 + 90) and grad_ang <= (22.5 + 135):
```



```
                neighb_1_x, neighb_1_y = i_x - 1, i_y + 1
                neighb_2_x, neighb_2_y = i_x + 1, i_y - 1

            # Now it restarts the cycle
            elif grad_ang > (22.5 + 135) and grad_ang <= (22.5 + 180):
                neighb_1_x, neighb_1_y = i_x - 1, i_y
                neighb_2_x, neighb_2_y = i_x + 1, i_y

            # Non-maximum suppression step
            if width > neighb_1_x >= 0 and height > neighb_1_y >= 0:
                if mag[i_y, i_x] < mag[neighb_1_y, neighb_1_x]:
                    mag[i_y, i_x] = 0
                    continue

            if width > neighb_2_x >= 0 and height > neighb_2_y >= 0:
                if mag[i_y, i_x] < mag[neighb_2_y, neighb_2_x]:
                    mag[i_y, i_x] = 0

    weak_ids = np.zeros_like(img)
    strong_ids = np.zeros_like(img)
    ids = np.zeros_like(img)

    # double thresholding step
    for i_x in range(width):
        for i_y in range(height):

            grad_mag = mag[i_y, i_x]

            if grad_mag < weak_th:
                mag[i_y, i_x] = 0
            elif strong_th > grad_mag >= weak_th:
                ids[i_y, i_x] = 1
            else:
                ids[i_y, i_x] = 2

    # finally returning the magnitude of
    # gradients of edges
    return mag


frame = cv2.imread("D:\\rgb_image.jpg",)

# calling the designed function for
# finding edges
canny_img = Canny_detector(frame)
cv2.imshow("rgb_image",canny_img)
cv2.waitKey(0)
```