Sveučilište u Splitu
Fakultet elektrotehnike, strojarstva i brodogradnje

Laboratorijske vježbe iz
digitalne obrada i analiza slike

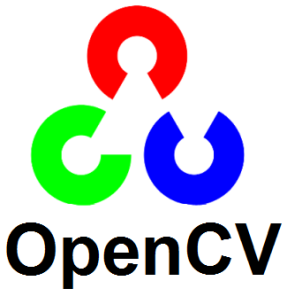
Vježba 7:

Detekcija objekata na slici

Split, 2020.

Zadatak 1.

Napisati program koji učita sliku 1., te detektira crvene regije na slici.



Slika 1

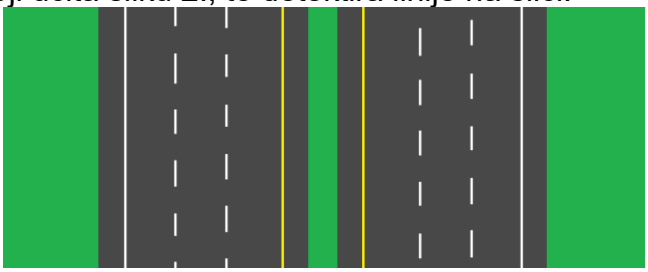
Kod:

```
import numpy as np
import argparse
import cv2

image = cv2.imread('../img/Slika1.png', cv2.IMREAD_COLOR)

boundaries=[([0,0,255], [0,0,255])]

for(lower, upper) in boundaries:
    lower=np.array(lower, dtype = "uint8")
    upper=np.array(upper, dtype = "uint8")

    mask=cv2.inRange(image, lower, upper)
    output=cv2.bitwise_and(image, image, mask=mask)

    cv2.imshow("images", np.hstack([image, output]))
    cv2.waitKey(0)
```

Rezultat:

Zadatak 2.

Napisati program koji učita sliku 2., te detektira linije na slici.

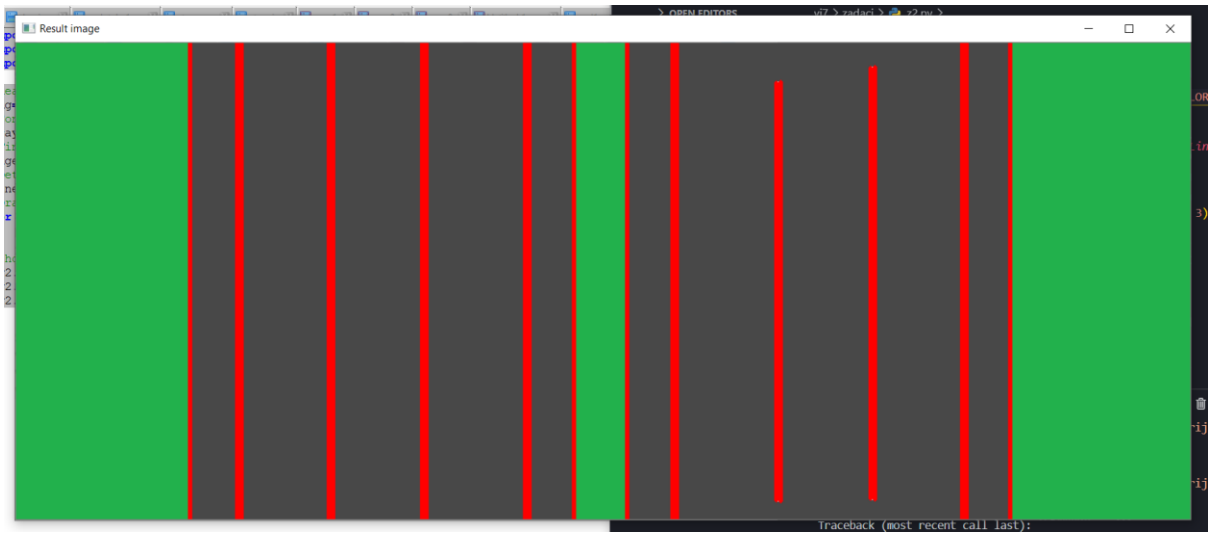


Slika 2

Kod:

```
import numpy as np
import argparse
import cv2

img=cv2.imread('../img/Slika2.png', cv2.IMREAD_COLOR)
gray=cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
edges=cv2.Canny(gray, 50, 200)
lines=cv2.HoughLinesP(edges, 1, np.pi/180,80, minLineLength=10, maxLineGap=250
)

for line in lines:
    x1, y1, x2, y2 = line [0]
    cv2.line(img, (x1,y1), (x2, y2), (0, 0, 255), 3)

cv2.imshow("Result image", img)
cv2.waitKey()
cv2.destroyAllWindows()
```

Rezultat:



Zadatak 3.

Napisati program koji učita sliku 1., te detektira kružnice na slici.

Kod:

```
import numpy as np
import cv2

def circleDetection():
    image = cv2.imread('../img/Slika1.png', cv2.IMREAD_COLOR)
    image = cv2.resize(image, (500, 400))
    output = image.copy()
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)
    blur = cv2.medianBlur(gray_image, 5)
    circles = cv2.HoughCircles(blur, cv2.HOUGH_GRADIENT, 1, 20, param1 = 100,
param2 = 50, minRadius = 0, maxRadius = 0)

    detected_circles = np.uint16(np.around(circles))

    for (x, y, r) in detected_circles[0, :]:
        cv2.circle(output, (x, y), r, (0, 255, 0), 3)
        cv2.circle(output, (x, y), 2, (255, 0, 0), 3)

    cv2.imshow("Original", image)
    cv2.imshow("Nova", output)
    cv2.waitKey()
    cv2.destroyAllWindows()
circleDetection()
```

Rezultat: