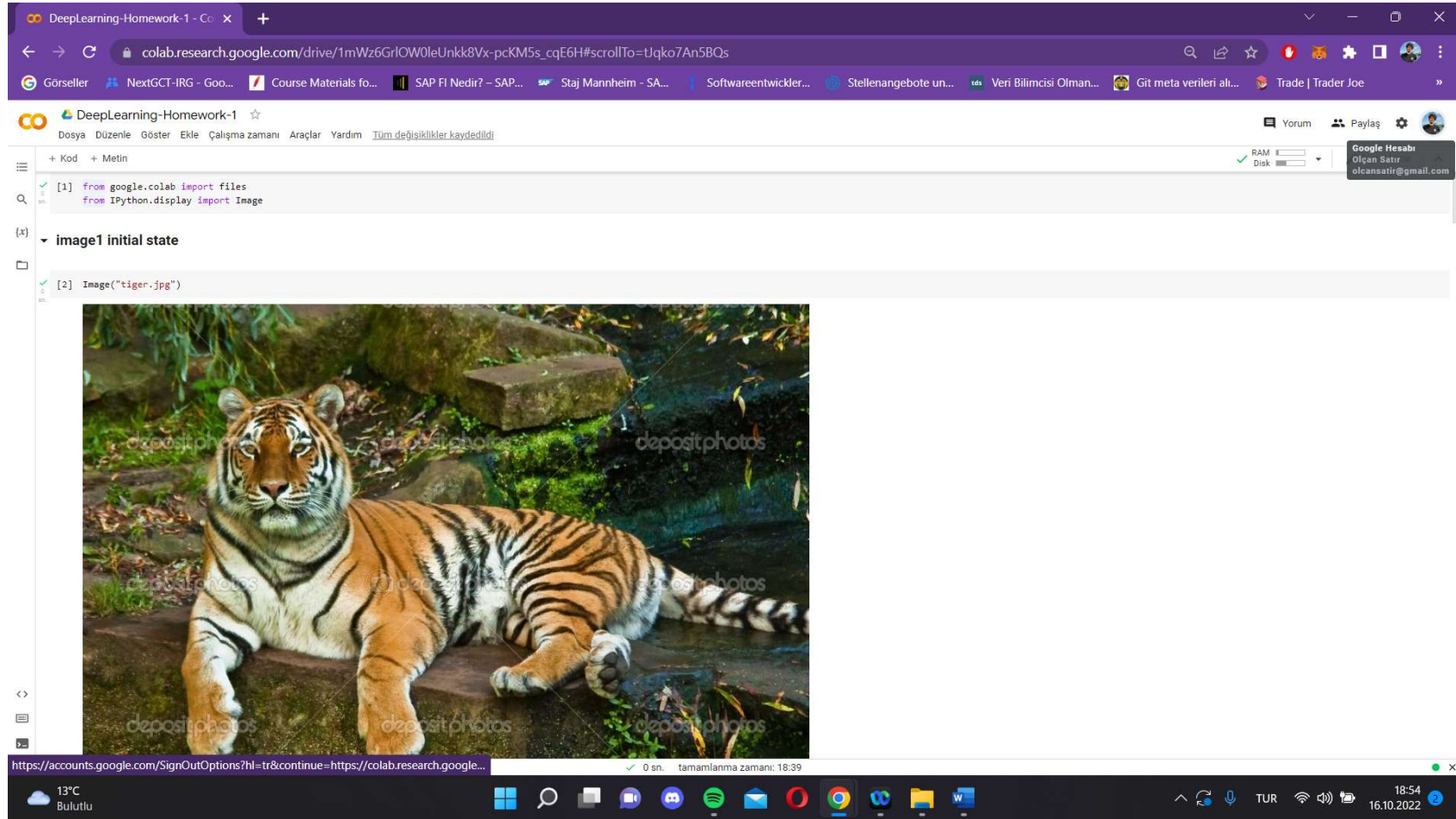


OLÇAN SATIR

152120171109

Deep Learning Homework-1 Report

Question 1: We open the image1 given in this image in colab environment.



We open the image2 given in this image in colab environment.

DeepLearning-Homework-1 - Co x +

colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H#scrollTo=Uqko7An5BQs

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DeepLearning-Homework-1

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım Tüm değişiklikler kaydedildi


+ Kod + Metin

RAM Disk

Google Hesabı Olcan Satir olcansatir@gmail.com

image2 initial state

```
[3] Image("tiger2.jpg")
```



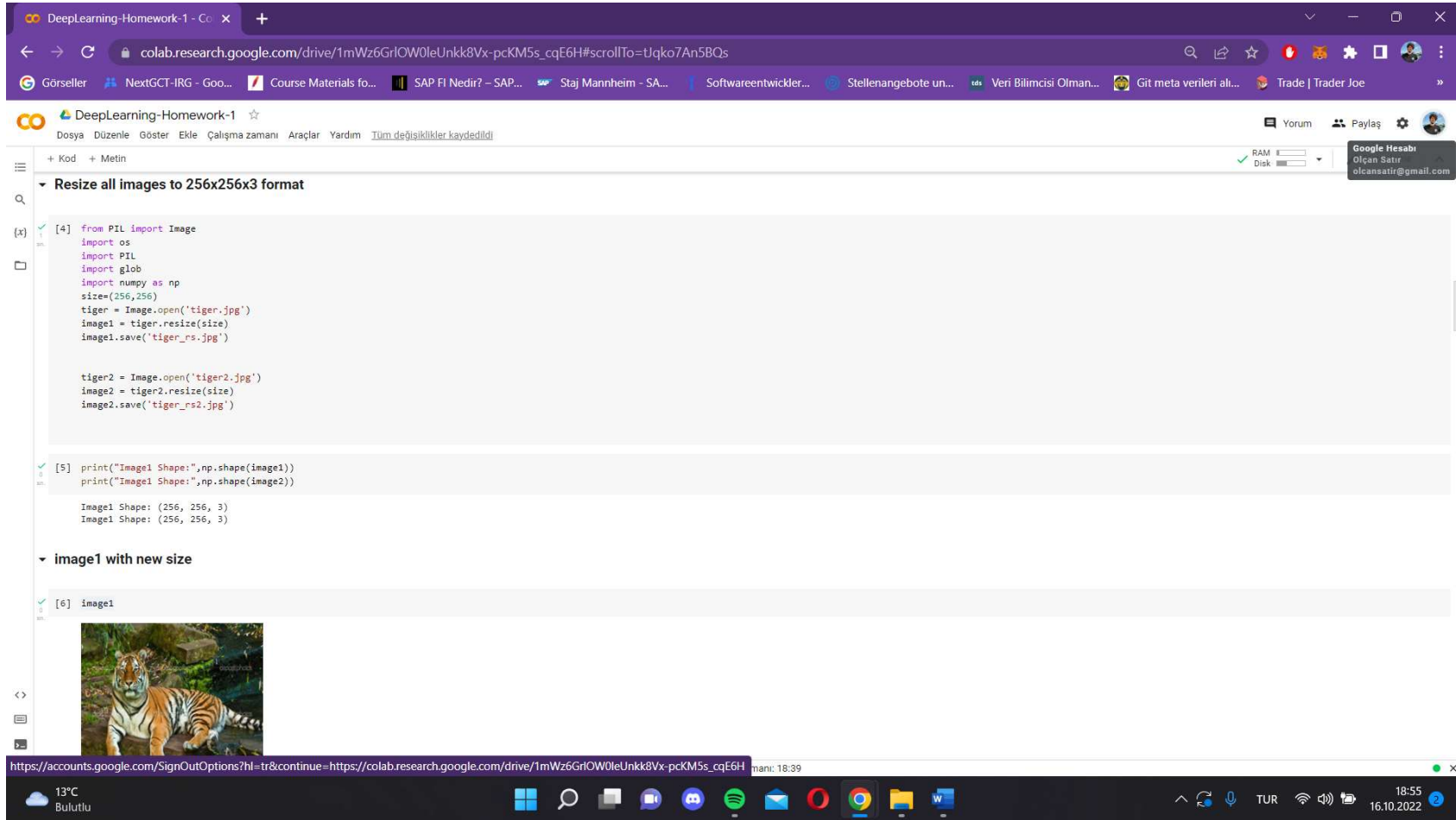
https://accounts.google.com/SignInOptions?hl=tr&continue=https://colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H

13°C Bulutlu

man: 18:39

18:55 16.10.2022

In this image, we are resizing the images and printing their shape for control purposes.



The screenshot displays a Google Colab notebook titled "DeepLearning-Homework-1". The notebook is open in a web browser, and the URL is visible in the address bar. The notebook content is as follows:

```
[4] from PIL import Image
import os
import PIL
import glob
import numpy as np
size=(256,256)
tiger = Image.open('tiger.jpg')
image1 = tiger.resize(size)
image1.save('tiger_rs.jpg')

tiger2 = Image.open('tiger2.jpg')
image2 = tiger2.resize(size)
image2.save('tiger_rs2.jpg')
```

[5] print("Image1 Shape:",np.shape(image1))
print("Image1 Shape:",np.shape(image2))

Image1 Shape: (256, 256, 3)
Image1 Shape: (256, 256, 3)

image1 with new size

[6] image1

The output of the notebook shows a small image of a tiger, which is the result of the resizing operation. The image is displayed in a window titled "image1".

In the image, above and in this image, we print the resized versions. As well as we flips image1 vertically.

DeepLearning-Homework-1 - Co x +

colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H#scrollTo=vu0sS3Vr5rM5

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DeepLearning-Homework-1

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım [Tüm dosyaları kaldır](#)

+ Kod + Metin



[6] 


image2 with new size

[7] image2 

1.flips image1 vertically

```
[8] import cv2
import numpy
from google.colab.patches import cv2_imshow

image = cv2.imread('tiger_1s.jpg', 1)
image = numpy.array(1111*(reversed(image)))
cv2_imshow(image)
cv2.waitKey(0)
```



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12°C Bulutlu

20:30 16.10.2022

In this image, we flip image1 vertically.

DeepLearning-Homework-1 - Co x +


colab.research.google.com/drive/1mWz6GrOW0leUnk8Vx-pcKM5s_cqE6H#scrollTo=vu0s3Vr5rM5

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DeepLearning-Homework-1

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım Tüm değişiklikler kaydedildi

+ Kod + Metin

[8]  -1


[x]

2.flips image1 horizontally

[9]

```
image1 = Image.open('tiger_rs.jpg')
width = image1.size[0]
height = image1.size[1]
for y in range(height):
    for x in range(width // 2):
        left = image1.getpixel((x, y))
        right = image1.getpixel((width - 1 - x, y))
        image1.putpixel((width - 1 - x, y), left)
        image1.putpixel((x, y), right)
```

image1



3.rotates image to left by 90 degree

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0 sn. tamamlanma zamanı: 20:28

12°C Bulutlu

TUR 20:31 16.10.2022

In this image, we turn image1 90 degrees to the left.

DeepLearning-Homework-1 - Co x +

colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H#scrollTo=Wu9TSf_0HjXb

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DeepLearning-Homework-1 ☆

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım Tüm değişiklikler kaydedildi


+ Kod + Metin

3.rotates image to left by 90 degree

```
[11] import math
import cv2
image1=Image.open('tiger_rs.jpg')
image2=Image.open('tiger_rs2.jpg')
```

```
[12] def rotate(image1,derece):
    for i in range(derece):
        width = image1.size[0]
        height = image1.size[1]
        tmp_size = width*2
        tmp = Image.new('RGBA',(tmp_size,tmp_size),(0,0,0,0))
        cx = int((tmp_size - width)/2)
        cy = int((tmp_size - height)/2)
        tmp.paste(image1,(cx,cy))
        tmp = tmp.rotate(1)
        cuts = int(math.floor((width+height)/math.sqrt(2)))
        pos = int((tmp_size - cuts)/2)
        tmp = tmp.crop((pos,pos,pos+cuts,pos+cuts))
    return tmp
```

```
[13] rotate(image1,90)
```



13°C Bulutlu

19:20 16.10.2022

In this image, to rotate image2 90 degrees to the left, we give the function the value 270.

DeepLearning-Homework-1 - Co x +

colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H#scrollTo=QMCKxsq-6Fsl

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DeepLearning-Homework-1

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım [Tüm dosyaları kaldır](#)

+ Kod + Metin

4.rotates image to right by 90 degree

```
[14] rotate(image2,270)
```



5.resizes input image to half by keeping aspect ratio


```
from google.colab.patches import cv2_imshow
nywidth=128

img = Image.open('tiger_rs.jpg')
wpercent = (nywidth/float(img.size[0]))
hsize = int((float(img.size[1])*wpercent))
img = img.resize((nywidth,hsize), PIL.Image.ANTIALIAS)
img.save('resized_half_tiger1.jpg')

img = Image.open('tiger_rs2.jpg')
wpercent = (nywidth/float(img.size[0]))
hsize = int((float(img.size[1])*wpercent))
img = img.resize((nywidth,hsize),PIL.Image.ANTIALIAS)
img.save('resized_half_tiger2.jpg')

half_img1 = cv2.imread('resized_half_tiger1.jpg')
half_img2 = cv2.imread('resized_half_tiger2.jpg')

cv2_imshow(half_img1)
cv2_imshow(half_img2)
```



6.Crop left half of image1 and right half of image2 then merge these parts to create a new image

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13°C Bulutlu

18:59 16.10.2022

In this image, we cut out image1 to get the left half and cut out image2 to get the right half. We print these images.

DeepLearning-Homework-1 - Co x +

colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H#scrollTo=QMCKxsq-6Fsl

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DeepLearning-Homework-1

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım Tüm değişiklikler kaydedildi


+ Kod + Metin

6.Crop left half of image1 and right half of image2, then merge these parts to create a new image.


```
[16] width, height = image1.size
    wid = int(width / 2)
    cropped_tiger1 = image1.crop((0, 0, wid, height))

    width, height = image2.size
    wid = int(width / 2)
    hei = int(height/2)
    cropped_tiger2 = image2.crop((hei, 0, width, height))
```

[17] cropped_tiger1



[18] cropped_tiger2



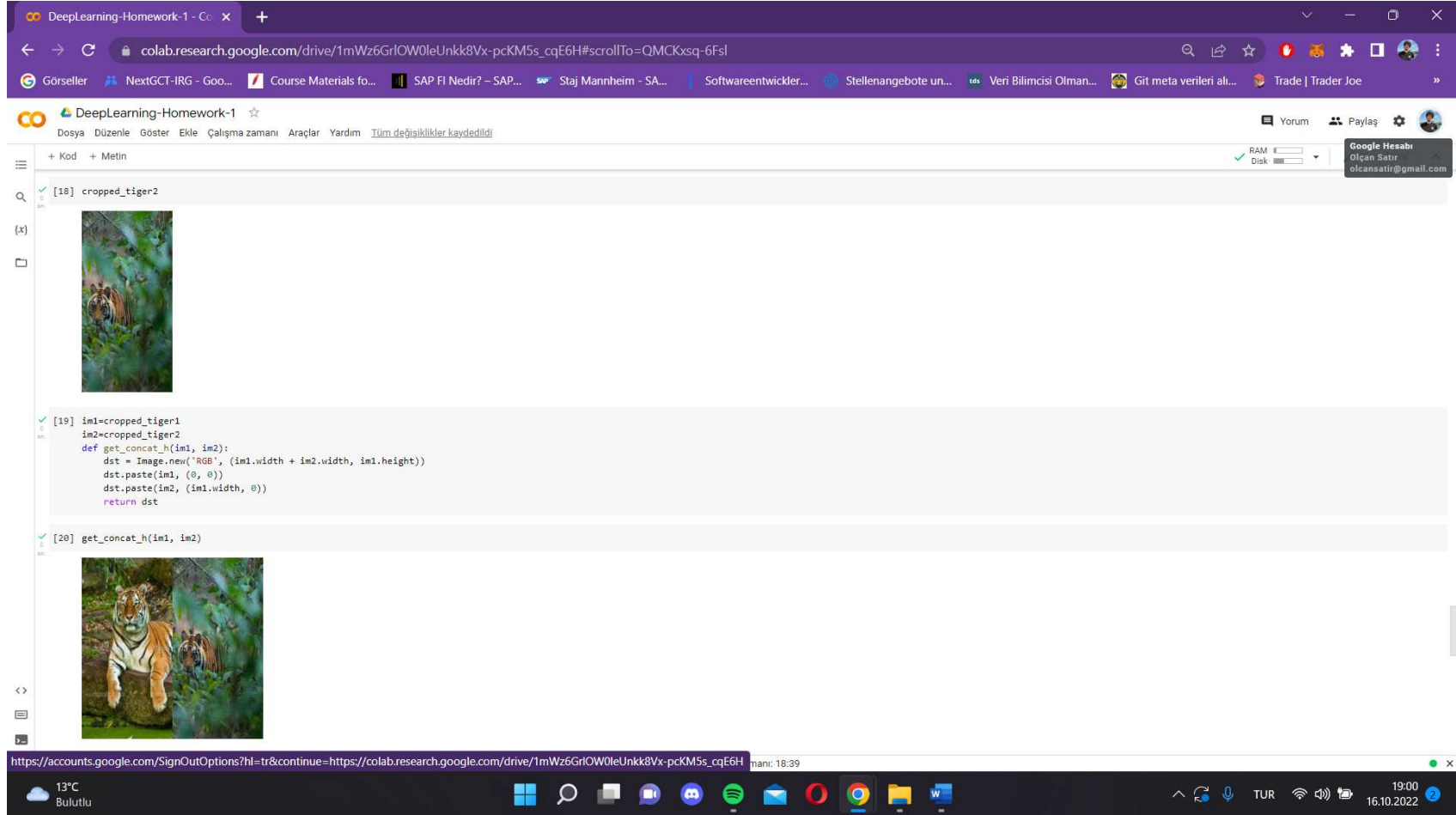
https://accounts.google.com/SignOutOptions?hl=tr&continue=https://colab.research.google.com/drive/1mWz6GrLOW0leUnkk8Vx-pcKM5s_cqE6H

13°C Bulutlu

man: 18:39

18:59 16.10.2022

In this image, we combine the half pictures we cut and print them as a single picture with the help of the function.



The screenshot shows a Google Colab notebook titled "DeepLearning-Homework-1". The notebook contains three cells:

- Cell [18] displays a cropped image of a tiger, labeled "cropped_tiger2".
- Cell [19] contains Python code for concatenating two images horizontally:

```
[19] im1=cropped_tiger1
im2=cropped_tiger2
def get_concat_h(im1, im2):
    dst = Image.new('RGB', (im1.width + im2.width, im1.height))
    dst.paste(im1, (0, 0))
    dst.paste(im2, (im1.width, 0))
    return dst
```

- Cell [20] displays the result of the function call `get_concat_h(im1, im2)`, showing two tiger images concatenated horizontally.

The bottom of the image shows a Windows taskbar with the date 16.10.2022 and time 19:00.

Question 2: In this image, we convert our image from BGR to RGB and show it.

The screenshot shows a Google Colab notebook interface. The browser address bar displays the URL: colab.research.google.com/drive/1U8KrsNKhm3IDFhW9bKFL-K7LFPsFyt. The notebook title is "DeepLearning-Homework-1.2". The code cell contains the following Python code:

```
import cv2
import numpy as np
from matplotlib import pyplot as plt
from google.colab.patches import cv2_imshow

image = cv2.imread('red_bust.png')
img = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
cv2_imshow(img)
```

The output of the code is a 10x6 grid of characters. The characters are 'X' (blue) and 'O' (orange). The grid is as follows:

X	X	O	X	O	X
O	X	O	X	O	O
X	X	O	X	X	O
X	O	X	O	O	X
X	X	X	X	X	X
X	O	O	X	O	O
O	X	X	X	O	X
O	O	O	X	X	O
X	O	X	X	X	X
X	X	O	X	O	X
O	X	X	X	O	X
X	O	X	X	O	X

The bottom status bar shows the system temperature as 12°C, weather as "Bulutlu", and the time as 22:12 on 16.10.2022.

In this image, we mask and show our image.

DeepLearning-Homework-1.2 - C x +

colab.research.google.com/drive/1U8KrsNKhm3IDFhW9bKfL_K7LFPsFyt

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DeepLearning-Homework-1.2

Dosya Düzenle Göster Ekle Çalışma zamanı Araçlar Yardım [Tüm dosyaları kaldır](#)

+ Kod + Metin

[2] lower_bound = np.array([0, 0, 0])
upper_bound = np.array([250, 250, 60])
image_mask = cv2.inRange(img, lower_bound, upper_bound)
cv2.imwrite('masked.png', image_mask)

True

[3] img_rgb = cv2.imread('masked.png')
cv2.imshow('img_rgb')

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12°C Bulutlu

0 sn tamamlama zamanı: 22:08

TUR 22:10 16.10.2022

In this image, we convert our image to grayscale and then define the image we will search in the image as the template.

We give the Threshold value as 0.8, if it achieves 80% or more similarity, it is included in the cluster.

```
[4] img_gray = cv2.cvtColor(img_rgb, cv2.COLOR_BGR2GRAY)
    template = cv2.imread('template.png', 0)
    w, h = template.shape[::-1]

[5] cv2.imshow('template', template)

[6] res = cv2.matchTemplate(img_gray, template, cv2.TM_CCOEFF_NORMED)
    threshold = 0.8
    loc = np.where( res >= threshold)

    f = set()

    for pt in zip(*loc[::-1]):
        cv2.rectangle(img_rgb, pt, (pt[0] + w, pt[1] + h), (0,0,255), 2)

        sensitivity = 90
        f.add((round(pt[0]/sensitivity), round(pt[1]/sensitivity)))

    cv2.imwrite('res.png', img_rgb)
```

In this image, we see that there are those with a similarity rate of over 80%. These are included in the cluster and the total number of elements of the cluster is suppressed. We see that there are 18 red X in total.

DeepLearning-Homework-12

colab.research.google.com/drive/1U8KrsNKhm3IDFhW9bKFI_-K7LFPsFyt#scrollTo=UuTBEZWwG2Yj

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DeepLearning-Homework-12

Dosya Düzenle Öster Ekle Çalışma zamanı Araçlar Yardım Tüm dosyaları kaldır


+ Kod + Metin

[6] cv2.imwrite('res.png',img_rgb)

True

[7] res_img = cv2.imread('res.png')

cv2.imshow('res_img')



[8] found_count = len(f)

print("Red x number : ",found_count)

Red x number : 18

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12°C Bulutlu

0 sp. tamamlama zamanı: 22:23

TUR 22:24 16.10.2022

[8] found_count = len(f)

print("Red x number : ",found_count)

Red x number : 18