Project 1: Online Coloring

Mert Doğan (041502002)
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In this project, I developed a program in Python enabling the user to color a picture. I input to my program is an image file in *.jpg *.png format and my output which is colored image saved as *.png file. I use tkinter for create my GUI. In my program user can select a color, click a point in the image and paint it. My program can fill selected region including this point with the selected color but I just do 4-labeling algorithm so in some points there are some bad paintings on the image. After user click the saveImage button, colored image will be written as an image file to the disk in *.jpg or *.png file format. In addition, I create drawing with mouse in my project, user can draw anything on the opened screen.

1. My GUI

I use root= Tk() code for implement my GUI. I use root.title for write my title. I use root.geometry for arrange to my window size. I use root.configure for my GUI's background color. I use menubar to open my menu. For adding new files and features I use filemenu.add_command. I fill it them from open,draw,save..etc. I use _seperator for reserve a space. In the end root.mainloop() make the codes for a loop.

```
global root
root = Tk()


root.title("Basic Paint")
root.geometry("600x450+500+200")
root.configure(bg='#007700')

menubar = Menu(root)
filemenu = Menu(menubar, tearoff=0)
filemenu.add_command(label="Open", command=openFile)
filemenu.add_command(label="Draw", command=drawing)
filemenu.add_command(label="SaveImage", command=saveImage)
filemenu.add_command(label="SaveDrawimg", command=saveDrawing)
filemenu.add_command(label="Clear", command=clear)
filemenu.add_separator()
filemenu.add_command(label="Exit", command=root.quit)
menubar.add_cascade(label="File", menu=filemenu)


root.config(menu=menubar)
pickColor = Button(root, text="Pick Color", bg="#7fff00", fg= "black", font="Verdana 12 bold italic", command=getColor).pack()


root.mainloop()
```

Figure 1: My GUI

2. Read and display the input image file

I use openFile method to open, read, resize and load pixels from drawingImage. I use filedialog to ask file name, I use PIL.Image to read an image, I use .resize method to resize my image's pixels. I also use addToScreen which show the image on the screen and labeling which is 4- labeling methods.

```
def openFile():

    file_path = filedialog.askopenfilename()
    global drawingImage
    drawingImage = PIL.Image.open(file_path)
    drawingImage = drawingImage.resize((250, 250))
    global pix
    pix = drawingImage.load()

    xSize, ySize = drawingImage.size
    for i in range(xSize):
        for j in range(ySize):
            pix[i, j] = vanishNoisesFromPixel(pix[i, j])
    addToScreen(drawingImage)
    labeling(drawingImage)
```

Figure2: openFile method method

```
def addToScreen( Img ):

    render = ImageTk.PhotoImage(Img)
    img = Label (root,image=render)
    img.image=render
    img.place(x=150,y=50)
    img.bind("<Button-1>",printcoords
```

Figure3: addToScreen

3. Display a color palette

I use askcolor() in the getColor method for ask color to user. Askcolor() shows us a color palette and chosen color gives us 2 values taple. I fill the r,g,b values from the given taples and equal it to choosen color.

```
def getColor():

        color = askcolor()
        r = color [0][0]
        g = color [0][1]
        b =color[0][2]
        global choosenColor
        choosenColor=int (r) ,int (g),int (b)
        print (choosenColor)
```

Figure 4: getColor Method

Acquirements:

In this project, I learned how create and implement a GUI in python. When I develop this project I import and use so many useful methods() which are tkinter, filedialog, PIL, askcolor(). I believe this project has improved my coding, problem-solving and design skills and also I gain time management while I was developing this project.

References:

1- http://knowpapa.com/cchoser/

2- https://stackoverflow.com/questions/34108841/creating-a-simple-gui-program-using-tkinter-in-python

3- https://www.tutorialspoint.com/python/python_gui_programming.htm

My github is: https://github.com/mmertdogann