Module Name

Project Overview		
Enter description here **Python Advanced Project - Cartoonify Picture. In this project, students will learn how to use python code so they are able to take any picture that they have and apply a cartoon filter over it using OpenCV.**		
Project Level		
Beginner/Advanced **Advanced**		
Estimated Time:		
Enter Hours/Minutes **10mins-30mins (Counting in explaining it)**		
What you'll need for this project		
Item 1	Python IDE(Thonny)	
Item 2	Strawberry Pi	
Additional Resources		

Module Name

Step 1:	
In the advanced camp, students should be used to importing modules to be used in projects so the central concept we will be focusing on in this project is OpenCV and how it can be incorporated into Python and used to cartoonify our pictures. The first part of this project you have to do before anything is to run the command `pip install opencv-python` in the system shell because if you don't, the IDE won't recognize the cv code at all and the whole project won't work. After you run this command, It will download OpenCV into your IDE and you will be able to use it to transform any image that you have.	Inse `C:\Users\Jasen\Downloads\Thonny>pip install opencv-python` rt Photo
Step 2:	
The one module used by the import statement is cv2. Cv2 is the library used for Computer Vision and is the main reason why we are able to transform the image. Tkinter.filedialog import * imports every exposed object in Tkinter(the standard GUI library for Python) and this code wouldn't be able to work without it.	1 `import cv2` 2 `from tkinter.filedialog import *` Insert Photo
Step 3:	

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In the third step, you now input the main code that which should transform the image and cartoonify it. photo = askopenfilename() is asking for the file you would like to use and img = cv2.imread(photo) is reading and analyzing the photo your using so it can be transformed. grey = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY), gtey = cv2.medianBlur(grey, 5), and edges = cv2.adaptiveThreshold(grey, 255, cv2.ADAPTIVE_THRESH_MEAN_C, cv2.THRESH_BINARY, 9, 9) are setting up the colors and outlines to be used when the picture is transformed by the cartoon filter. color = cv2.bilateralFilter(img, 9, 250, 250) and cartoon = cv2.bitwise_and(color, color, mask = edges) is applying the effects and outlines that you see on the now transformed image. cv2.imshow("Image", img)and cv2.imshow("Cartoon", cartoon) show the effects filter in the updated in a kind of before and after template. cv2.imwrite("cartoon.jpg", cartoon) , cv2.waitKey(0), and cv2.destroyAllWindows() saves the image so you can show your friends and family the new picture.

```
4  photo = askopenfilename()
5  img = cv2.imread(photo)
6
7  grey = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
8  gtey = cv2.medianBlur(grey, 5)
9  edges = cv2.adaptiveThreshold(grey, 255, cv2.ADAPTIVE_THRESH_M
10
11 #cartoonize
12 color = cv2.bilateralFilter(img, 9, 250, 250)
13 cartoon = cv2.bitwise_and(color, color, mask = edges)
14
15 cv2.imshow("Image", img)
16 cv2.imshow("Cartoon", cartoon)
17
18 #save
19 cv2.imwrite("cartoon.jpg", cartoon)
20 cv2.waitKey(0)
21 cv2.destroyAllWindows()
```

Insert Photo

```
9  edges = cv2.adaptiveThreshold(grey, 255, cv2.ADAPTIVE_THRESH_MEAN_C, cv2.THRESH_BINARY, 9, 9)
10
```

Step 4:

Save and run the code! Enjoy your new picture and save it so you can now show your friends and family.