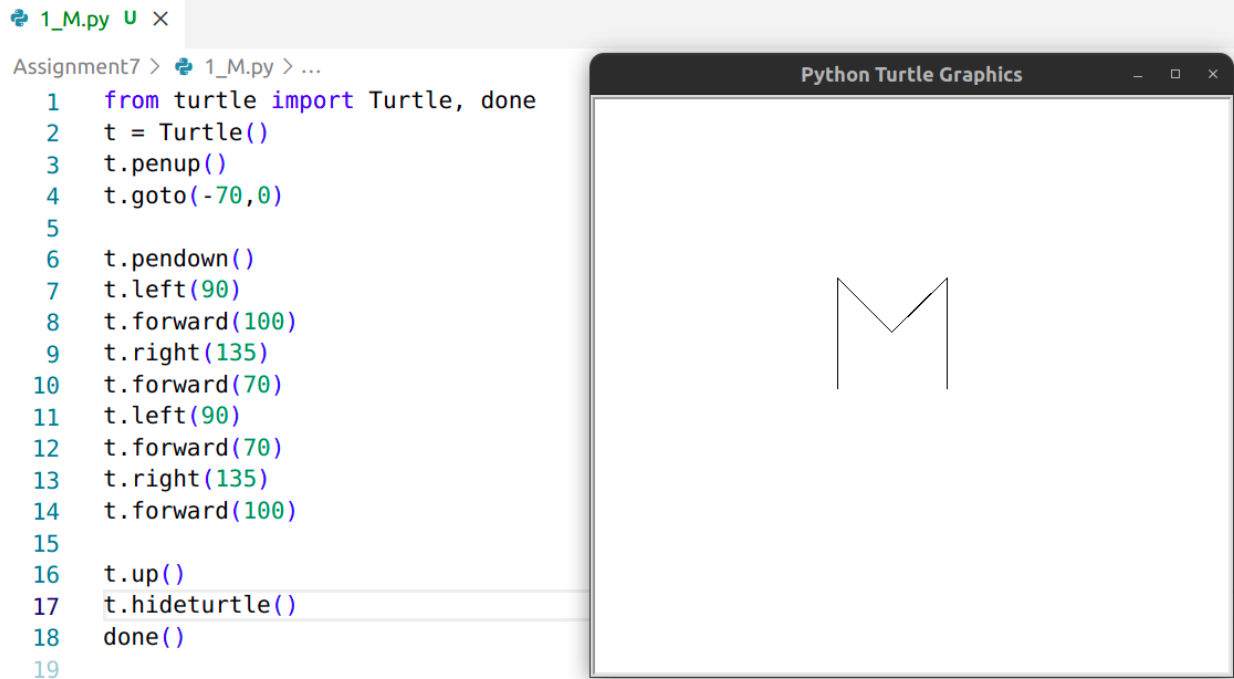


Programming in Python CST 362

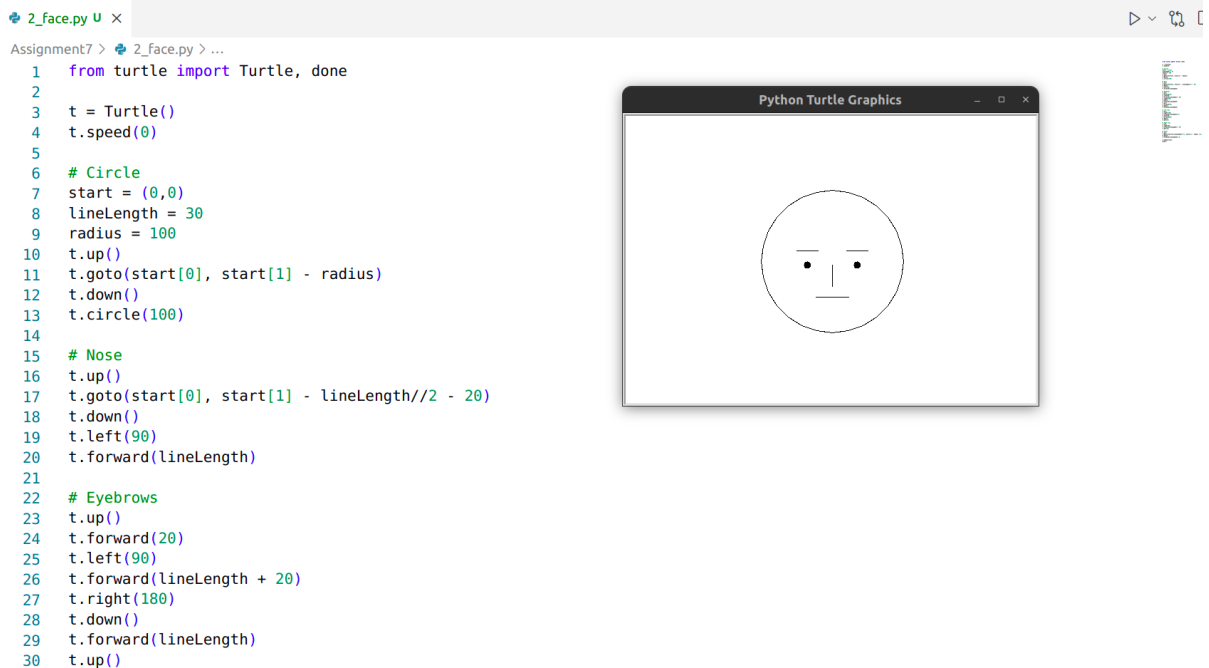
Assignment 7

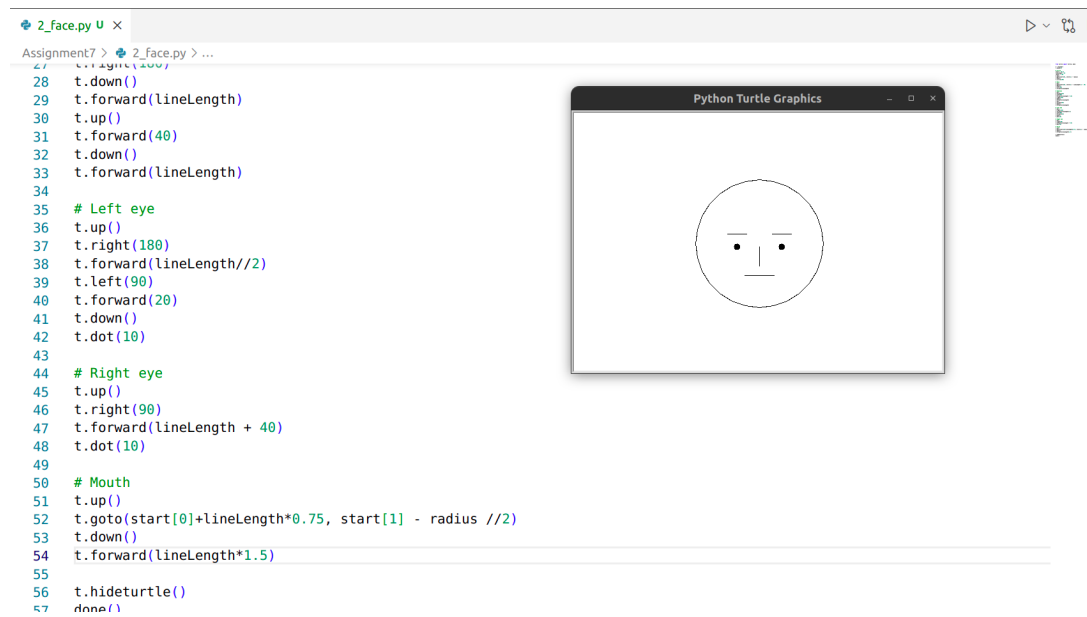
Mayon Francis
CS6A
44

1. Draw the first letter of your name using turtle graphics. (M)

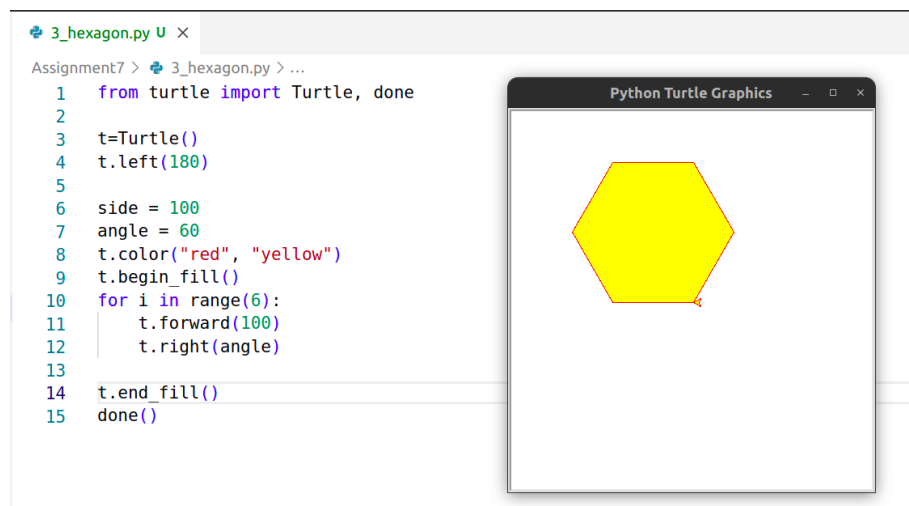


2. Draw the following figure (Face)

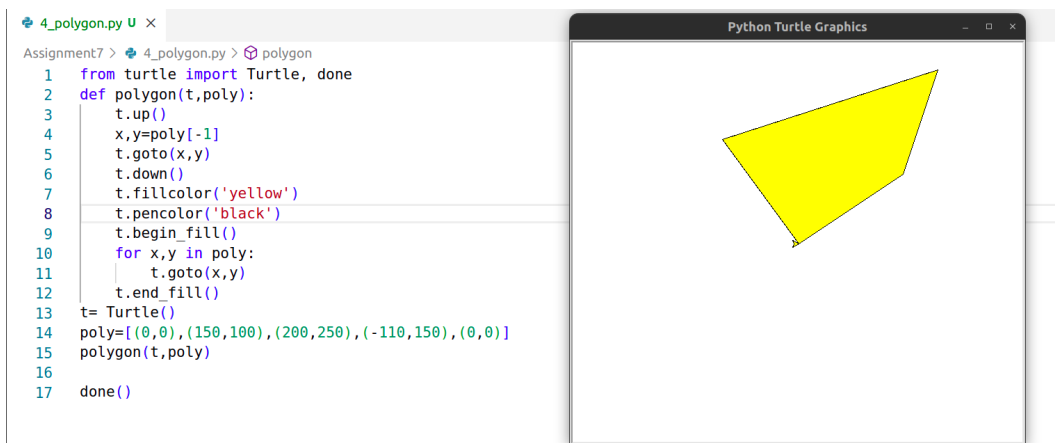




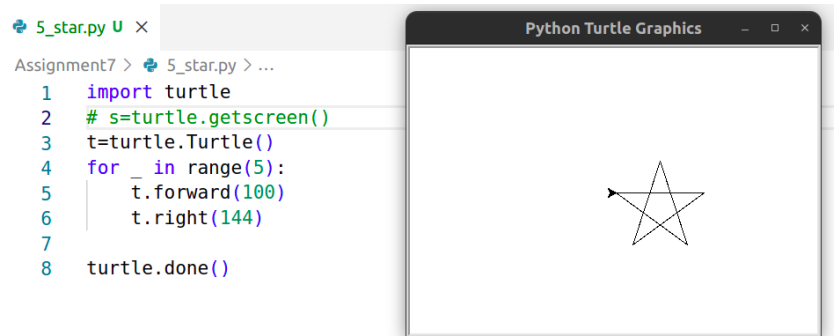
3. Draw a filled hexagon. (red color hexagon filled with yellow color)



4. Draw a polygon. Coordinates of the polygon are stores in a list as tuples.

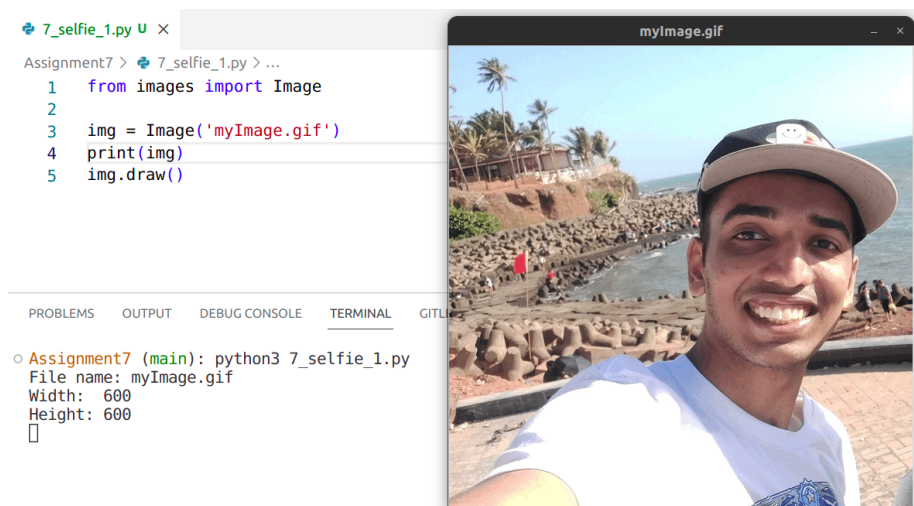


5. Draw a star



6. Take a selfie and create a gif file (use paint) and save it in your working directory as myimage.gif

7. Use image package shared earlier to do the following Read and Display the image and image details



Convert the image into black and white



Convert the image into gray scale

7_img_3_gray.py U X

Assignment7 > 7_img_3_gray.py > ...

```
1 from images import Image
2
3 img = Image('myImage.gif')
4 black = (0,0,0)
5 white = (255,255,255)
6
7 for y in range(img.getHeight()):
8     for x in range(img.getWidth()):
9         (r,g,b) = img.getPixel(x,y)
10        r = r * 0.299
11        g = g * 0.587
12        b = b * 0.114
13        avg = int(r+g+b)
14        img.setPixel(x,y,(avg,avg,avg))
15
16 img.draw()
```

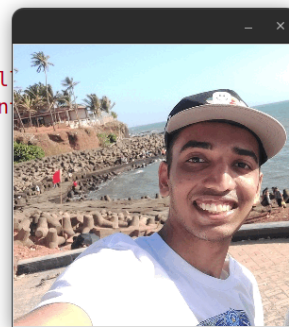


Scale the image into one half

7_img_4_scale.py U X


Assignment7 > 7_img_4_scale.py > ...

```
1 from images import Image
2 def shrink(image, factor):
3     """Builds and returns a new image which is a small
4     copy of the argument image, by the factor argument
5     width = image.getWidth()
6     height = image.getHeight()
7     new = Image(width // factor, height // factor)
8     oldY = 0
9     newY = 0
10    while oldY < height - factor:
11        oldX = 0
12        newX = 0
13        while oldX < width - factor:
14            oldP = image.getPixel(oldX, oldY)
15            new.setPixel(newX, newY, oldP)
16            oldX += factor
17            newX += 1
18            oldY += factor
19            newY += 1
20    return new
21
22 image=Image('myImage.gif')
23 print('Close the image to see the shrnked image')
24 image.draw()
25 image=shrink(image,2)
26 image.draw()
```



Blur the image

```
7_img_5_blur.py U X
Assignment7 > 7_img_5_blur.py > blur
1 from images import Image
2 from functools import *
3 def blur(image):
4     """Builds and returns a new image which is a
5     blurred copy of the argument image."""
6     def tripleSum(triple1, triple2):
7         (r1, g1, b1) = triple1
8         (r2, g2, b2) = triple2
9         return (r1 + r2, g1 + g2, b1 + b2)
10    new = image.clone()
11    for y in range(1, image.getHeight() - 1):
12        for x in range(1, image.getWidth() - 1):
13            oldP = image.getPixel(x, y)
14            left = image.getPixel(x - 1, y) # To left
15            right = image.getPixel(x + 1, y) # To right
16            top = image.getPixel(x, y - 1) # Above
17            bottom = image.getPixel(x, y + 1) # Below
18            sums = reduce(tripleSum, [oldP, left, right, top, bottom])
19            averages = tuple(map(lambda x: x // 5, sums))
20            new.setPixel(x, y, averages)
21    return new
22 image=Image('myImage.gif')
23 print('Close the image to see the blurred image')
24 image.draw()
25 # Blurring multiple times to get a more blurred image
26 blurred = blur(image)
27 blurred = blur(blurred)
28 blurred = blur(blurred)
29 blurred = blur(blurred)
30 blurred = blur(blurred)
31 blurred.draw()
```



Place a block rectangle strip on the face

```
7_img_6_rect.py U X
Assignment7 > 7_img_6_rect.py > ...
1 from images import Image
2
3 img = Image('myImage.gif')
4
5 yellow = (255,255,0)
6 for x in range(200,400):
7     for y in range(200,300):
8         img.setPixel(x,y,yellow)
9 img.draw()
```



8. Create the GUI Applications using tkinter Read radius of a circle (use entry box to read) and find the area and circumference(use two separate command button and associated functions)

```

8_GUI_1_circle.py
Assignment7 > 8_GUI_1_circle.py > ...
1 from tkinter import Tk, StringVar, Label, Entry, Button, mainloop, W, DoubleVar
2 from datetime import date
3 def calcArea():
4     areaVar.set(f"Area = {3.14*radiusVar.get()**2:.2f}")
5
6 def calcCircumference():
7     circumVar.set(f"Circumference = {2*3.14*radiusVar.get():.2f}")
8
9 master=Tk()
10 radiusVar = DoubleVar()
11 areaVar = StringVar()
12 circumVar = StringVar()
13
14 Label(master, text="Radius").grid(row=0)
15 radiusEntry = Entry(master, textvariable=radiusVar).grid(row=0, column=1)
16
17 areaButton = Button(master, text="Calculate Area", command=calcArea)
18 areaButton.grid(row=1, column=0)
19 areaLabel = Label(master, textvariable=areaVar).grid(row=1, column=1)
20
21 circumButton = Button(master, text="Calculate Circumference", command=calcCircumference)
22 circumButton.grid(row=2, column=0)
23 circumLabel = Label(master, textvariable=circumVar).grid(row=2, column=1)
24
25 mainloop()

```



8. b) Write a GUI-based program that allows the user to convert temperature values between degrees Fahrenheit and degrees Celsius. The interface should have labeled entry fields for these two values. These components should be arranged in a grid where the labels occupy the first row and the corresponding fields occupy the second row. At start-up, the Fahrenheit field should contain 32.0, and the Celsius field should contain 0.0. The third row in the window contains two command buttons, labeled >>>> and <<<<. When the user presses the first button, the program should use the data in the Fahrenheit field to compute the Celsius value, which should then be output to the Celsius field. The second button should perform the inverse function.

```

8_GUI_2_TempConv.py
Assignment7 > 8_GUI_2_TempConv.py > ...
5 celsiusVar.set(celsius)
6
7 def celsToFahr():
8     fahren = (celsiusVar.get() * 9 / 5) + 32
9     fahrenVar.set(fahren)
10
11 master=Tk()
12 fahrenVar = DoubleVar()
13 celsiusVar = DoubleVar()
14 fahrenVar.set(32.0)
15 celsiusVar.set(0)
16
17 Label(master, text="Fahrenheit").grid(row=0, column=1, pady=5)
18 Label(master, text="Celsius").grid(row=0, column=2, pady=5)
19 fahrenEntry = Entry(master, textvariable=fahrenVar).grid(row=1, column=1, padx=5)
20 celsiusEntry = Entry(master, textvariable=celsiusVar).grid(row=1, column=2, padx=5)
21
22 areaButton = Button(master, text=">>>>", command=fahrToCels)
23 areaButton.grid(row=2, column=1, pady=5)
24 areaButton = Button(master, text="<<<<", command=celsToFahr)
25 areaButton.grid(row=2, column=2, pady=5)
26
27 mainloop()

```

