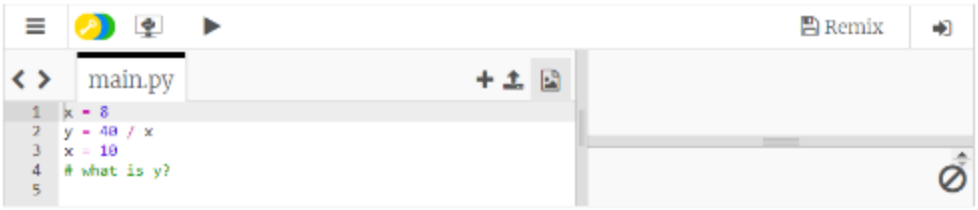
statement to the last, you can predict variable values.

1. Examine how the variables are **initialized** and updated throughout this small program. To do this, you can hand trace a program, recording the values of variables in a table. Hand tracing a program with a trace table allows you to follow your program, step by step, and record the values of each variable. Create a trace table for the following small program. Hand trace the values of each variable, recording how they change (or don't change) with each line of code.



Statements	x	y
`x = 8`	8	*undefined*
`y = 40 / x`	8	5
`x = 10`	10	5

Hide

2. Yes

3. Using new values for `x` and `y`, create a trace table to predict the value of `y`.

Statements	x	y
`x = 4`	4	*undefined*
`y = 48 / x`	4	12
`x = 8`	8	12

4. Yes

In the code below, which variables (a, b, c, and d) will be created and assigned values?

```
a = 1
''' begin block string
b = 2
c = 3 '''
d = 4
```

a *a*

b b and c

c a and d ✓

That's Correct!

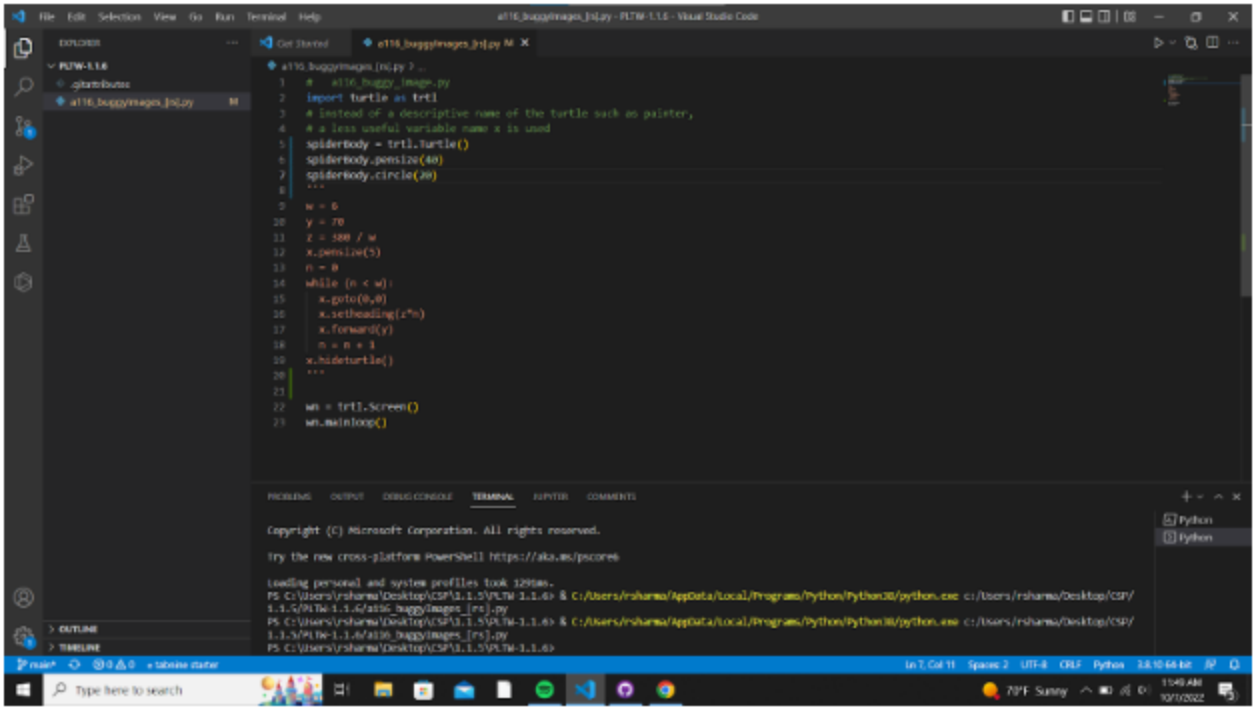
d a, b, c, and d

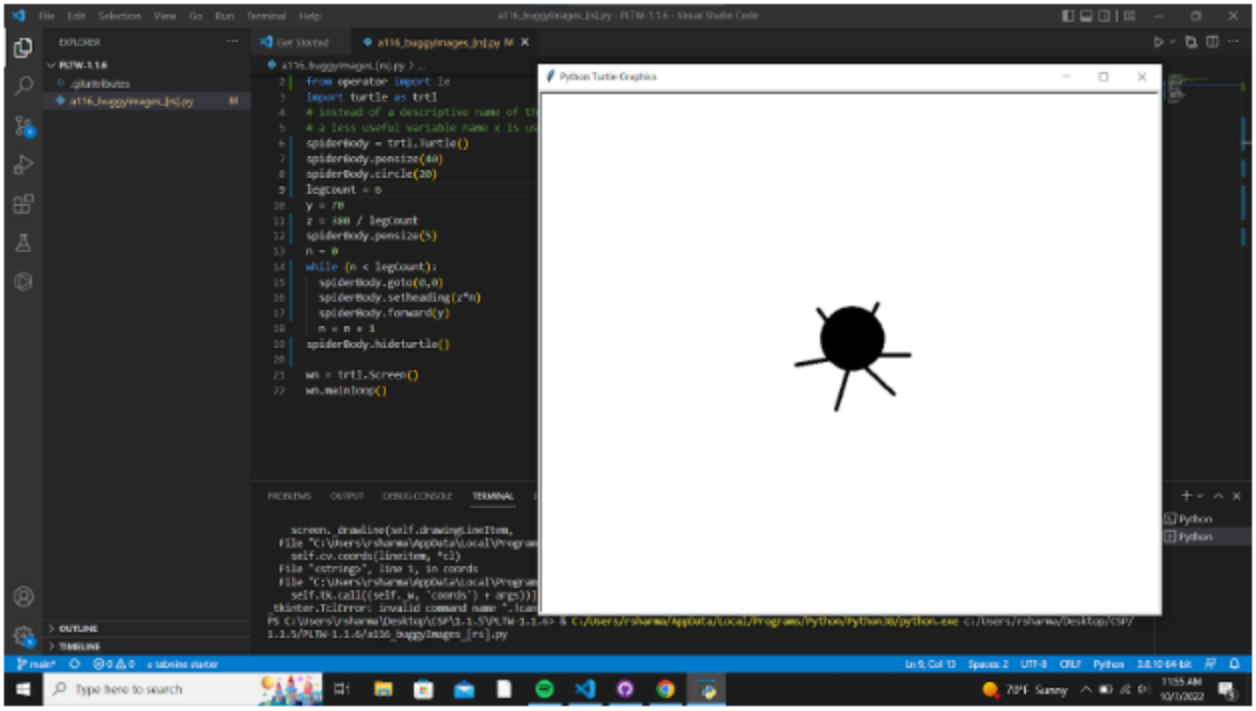
Stuck? Show Answer

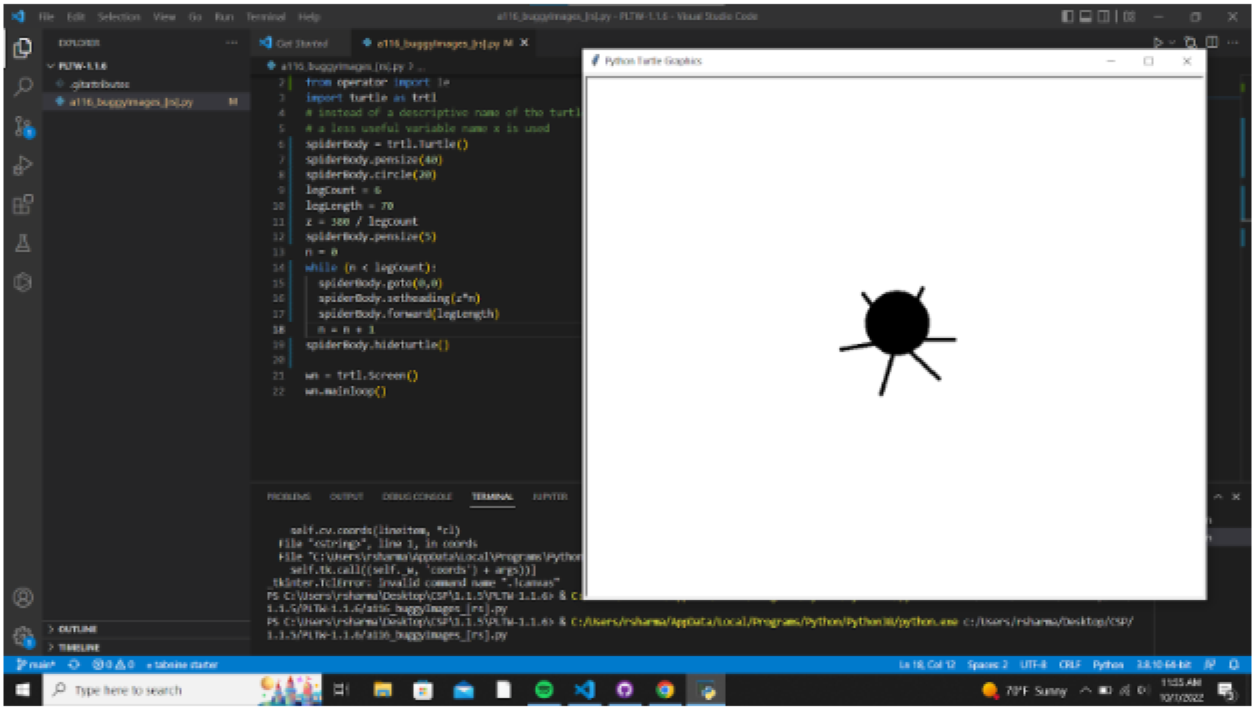
Reset Question

9 Save and run the program again. What does the first section of code do? What is a better variable name for `x`?

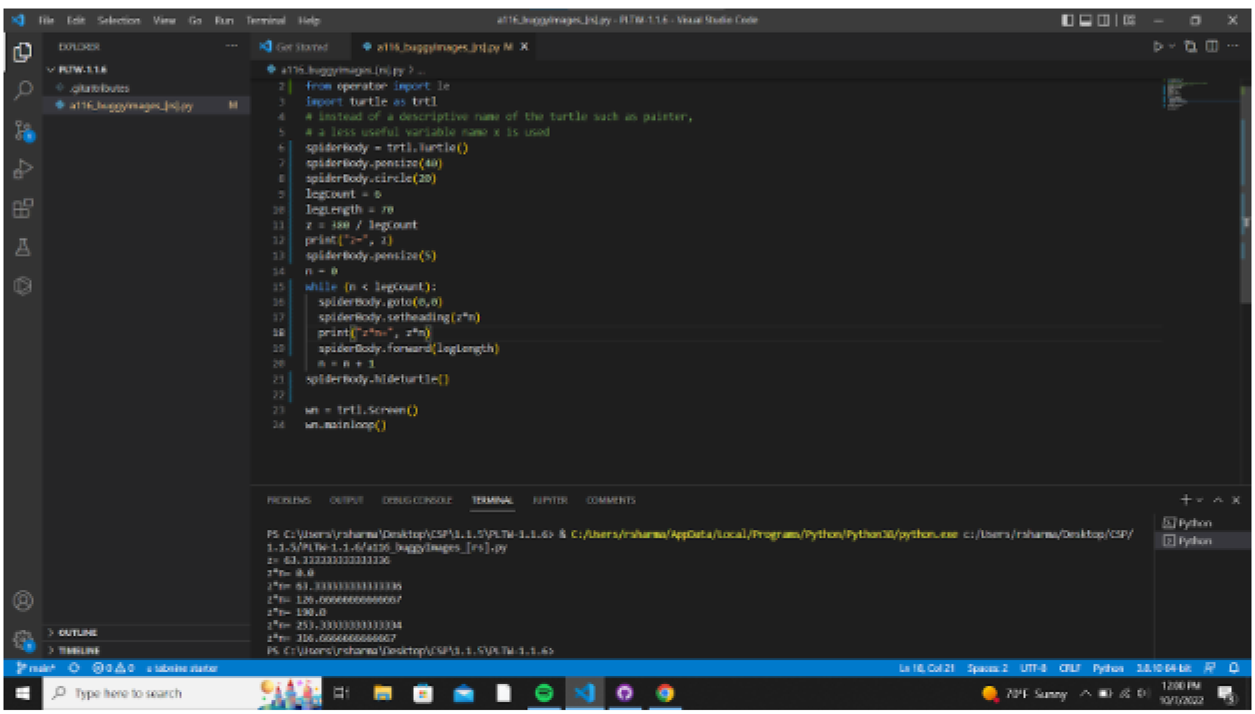
It creates the body for the spider. A better name would be spiderBody


File Edit Selection View Go Run Terminal Help
a116_buggyImages_[rs].py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs].py
Get Started
a116_buggyImages_[rs].py M
# a116_buggy_image.py
import turtle as trtl
# instead of a descriptive name of the turtle such as painter,
# a less useful variable name x is used
spiderBody = trtl.Turtle()
spiderBody.pensize(40)
spiderBody.circle(20)
'''
w = 6
y = 70
z = 180 / w
x.pensize(5)
n = 0
while (n < w):
x.goto(0,0)
x.setheading(z*n)
x.forward(y)
n = n + 1
x.hideturtle()
'''
wn = trtl.Screen()
wn.mainloop()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER COMMENTS
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
Loading personal and system profiles took 1298ms.
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs].py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs].py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6>
OUTLINE
TIMELINE
Type here to search
70°F Sunny
11:49 AM
10/1/2022

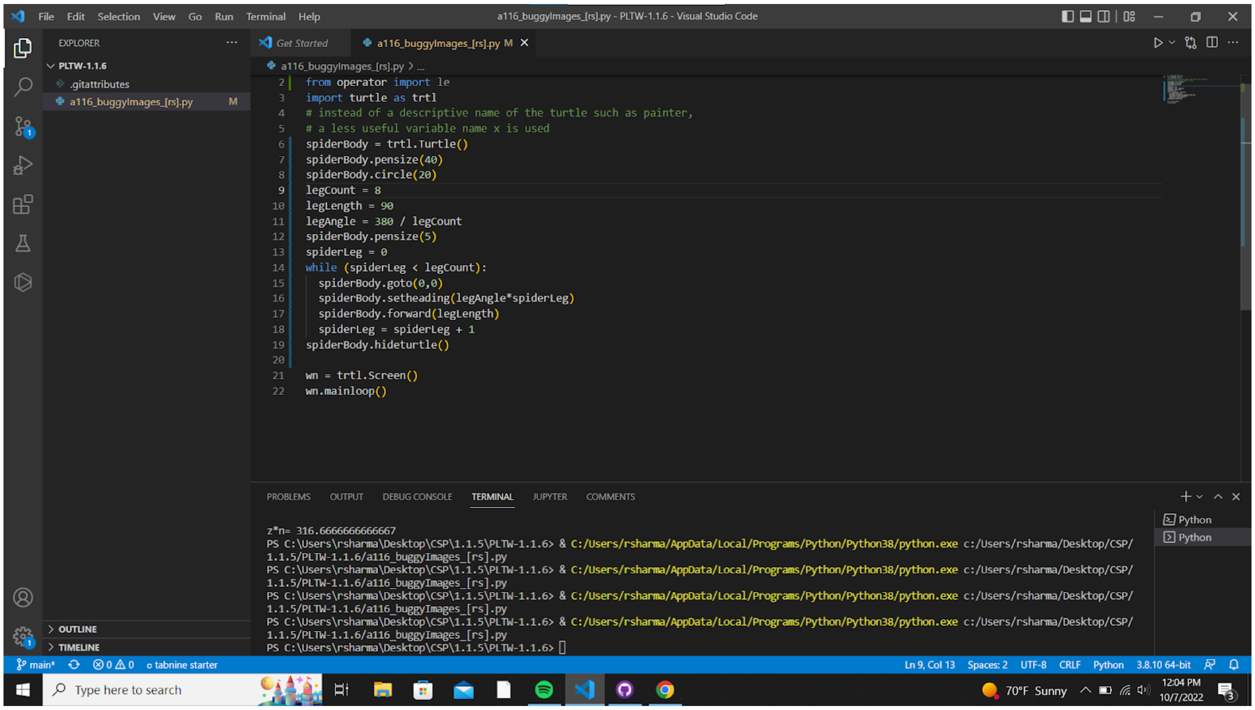

File Edit Selection View Go Run Terminal Help
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs].py
Get Started
a116_buggyImages_[rs].py M
from operator import le
import turtle as trtl
spiderBody = trtl.Turtle()
spiderBody.pensize(40)
spiderBody.circle(20)
legCount = 6
y = 70
z = 180 / legCount
spiderBody.pensize(5)
n = 0
while (n < legCount):
spiderBody.goto(0,0)
spiderBody.setheading(z*n)
spiderBody.forward(y)
n = n + 1
spiderBody.hideturtle()
wn = trtl.Screen()
wn.mainloop()
Python Turtle Graphics
screen.drawline(self.drawingLineItem,
File "C:\Users\rsharma\AppData\Local\Progra
self.cv.coords(lineitem, *cl)
File "<string>", line 5, in coords
File "C:\Users\rsharma\AppData\Local\Progra
self.tk.call((self._w, 'coords') + args))]
_tkinter.TclError: invalid command name ".1can
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs].py
OUTLINE
TIMELINE
Type here to search
70°F Sunny
11:55 AM
10/1/2022

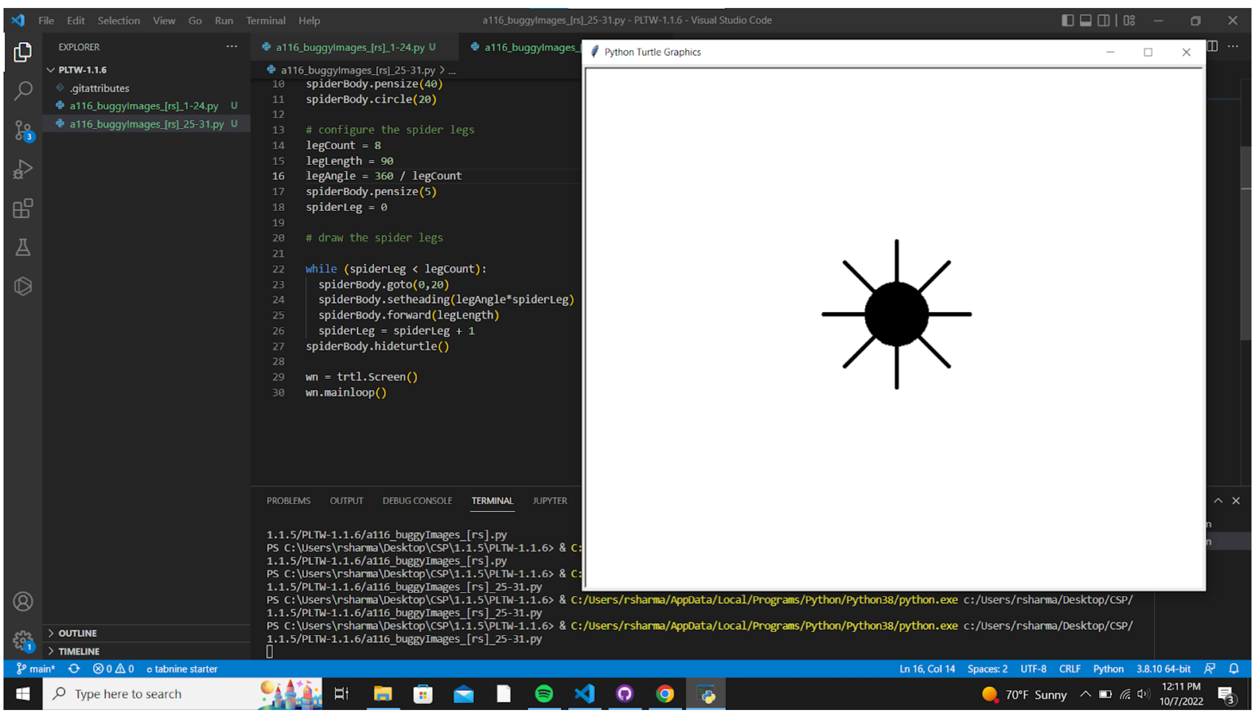


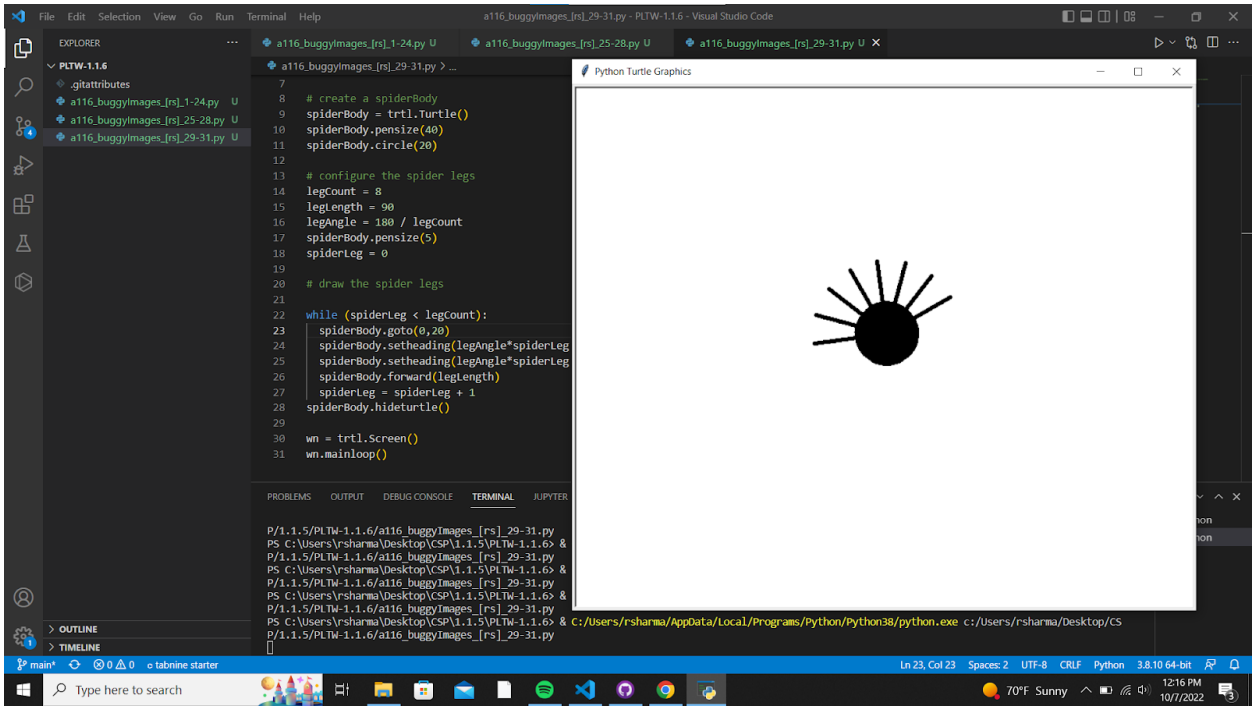
a116_buggyImages_[rs].py - PLTW-1.1.6 - Visual Studio Code
Python Turtle Graphics
from operator import le
import turtle as trtl
# instead of a descriptive name of the turtle
# a less useful variable name x is used
spiderBody = trtl.Turtle()
spiderBody.pensize(40)
spiderBody.circle(20)
legCount = 6
legLength = 70
z = 380 / legCount
spiderBody.pensize(5)
n = 0
while (n < legCount):
spiderBody.goto(0,0)
spiderBody.setheading(z*n)
spiderBody.forward(legLength)
n = n + 1
spiderBody.hideturtle()
wn = trtl.Screen()
wn.mainloop()
_tkinter.TclError: invalid command name ".!canvas"

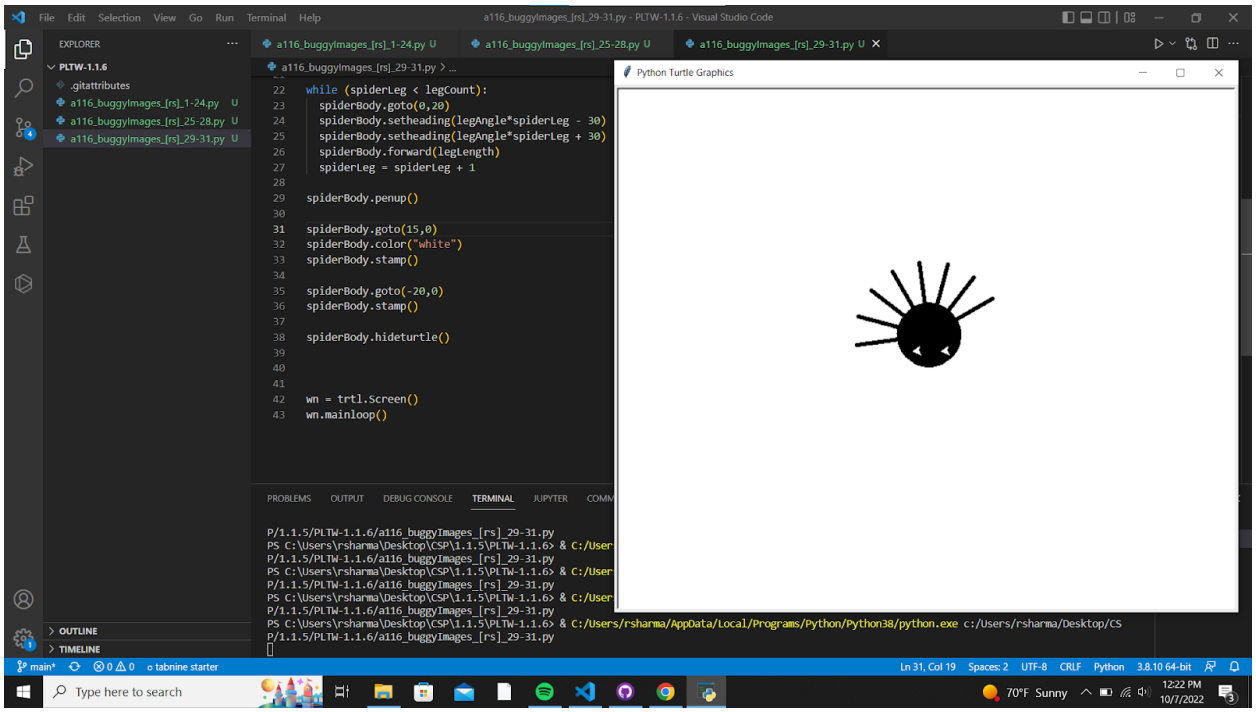


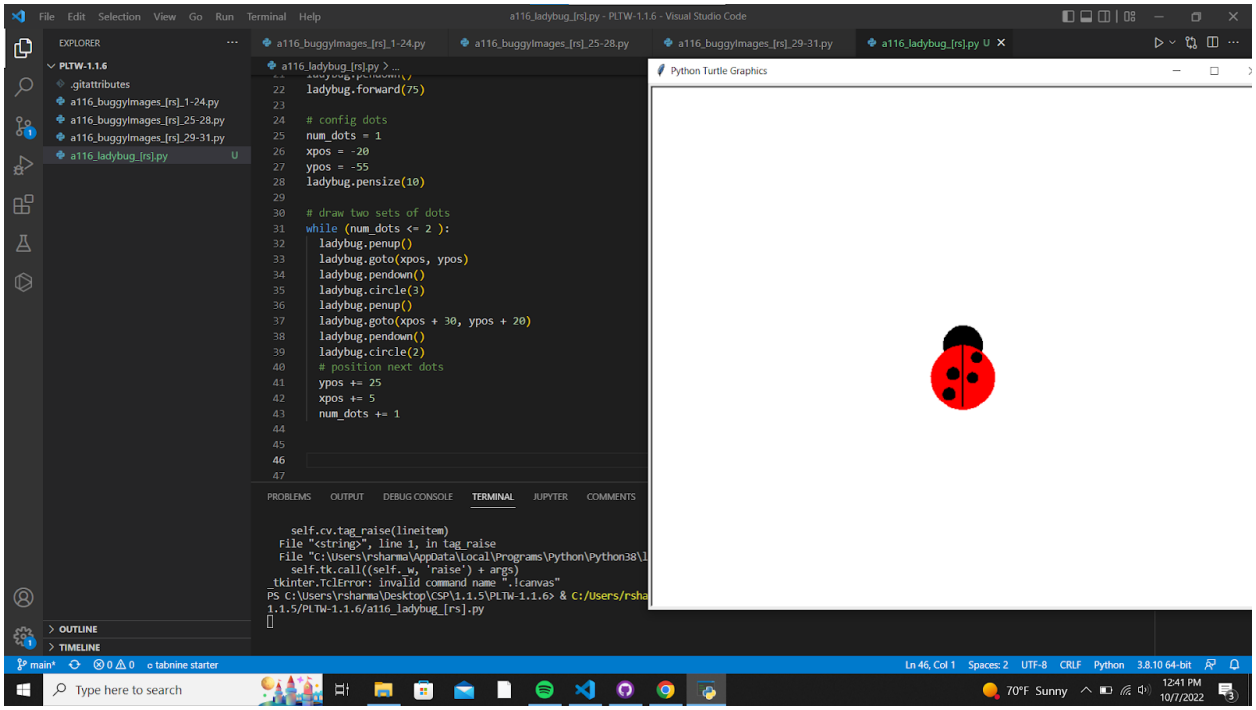
a116_buggyImages_[rs].py - PLTW-1.1.6 - Visual Studio Code
from operator import le
import turtle as trtl
# instead of a descriptive name of the turtle such as painter,
# a less useful variable name x is used
spiderBody = trtl.Turtle()
spiderBody.pensize(40)
spiderBody.circle(20)
legCount = 6
legLength = 70
z = 380 / legCount
print("z=", z)
spiderBody.pensize(5)
n = 0
while (n < legCount):
spiderBody.goto(0,0)
spiderBody.setheading(z*n)
print("z*n=", z*n)
spiderBody.forward(legLength)
n = n + 1
spiderBody.hideturtle()
wn = trtl.Screen()
wn.mainloop()
z= 63.333333333333336
z*n= 0.0
z*n= 63.333333333333336
z*n= 126.66666666666667
z*n= 190.0
z*n= 253.33333333333334
z*n= 316.6666666666667

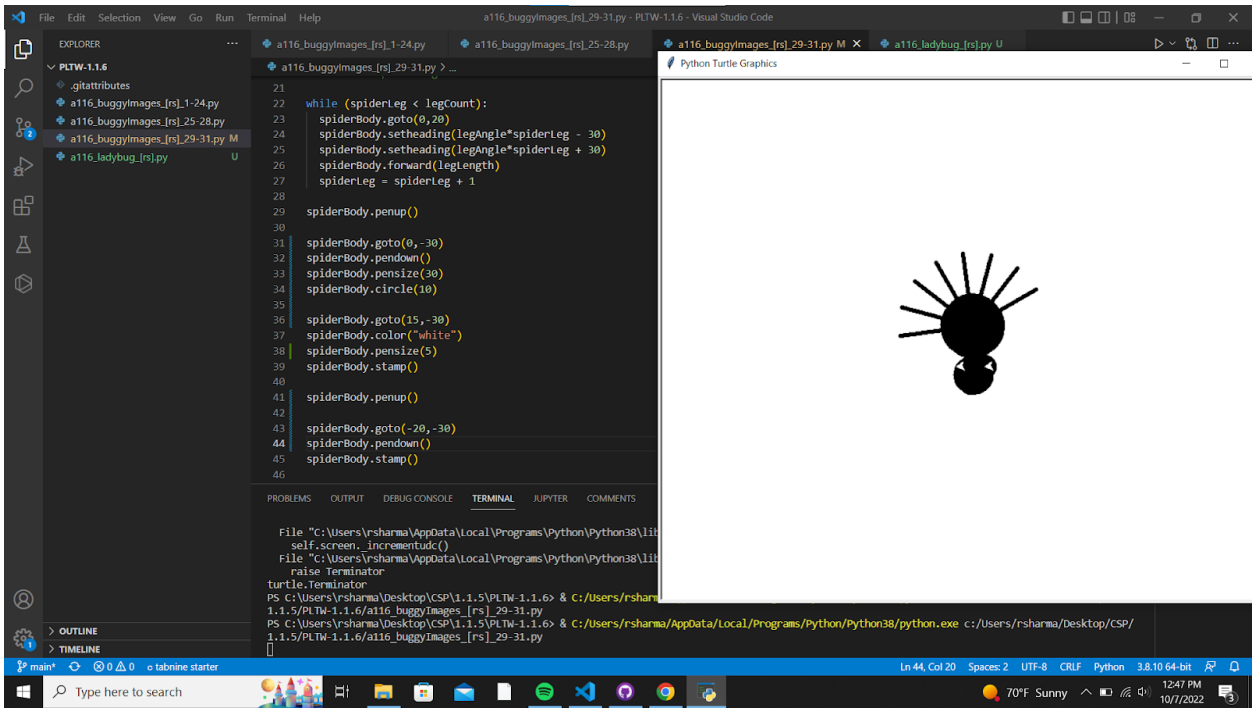

a116_buggyImages_[rs].py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs].py
from operator import le
import turtle as trtl
# instead of a descriptive name of the turtle such as painter,
# a less useful variable name x is used
spiderBody = trtl.Turtle()
spiderBody.pensize(40)
spiderBody.circle(20)
legCount = 8
legLength = 90
legAngle = 380 / legCount
spiderBody.pensize(5)
spiderLeg = 0
while (spiderLeg < legCount):
spiderBody.goto(0,0)
spiderBody.setheading(legAngle*spiderLeg)
spiderBody.forward(legLength)
spiderLeg = spiderLeg + 1
spiderBody.hideturtle()
wn = trtl.Screen()
wn.mainloop()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER COMMENTS
z*n= 316.6666666666667
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs].py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6>
Ln 9, Col 13 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:04 PM
10/7/2022


a116_buggyImages_[rs]_25-31.py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs]_1-24.py
a116_buggyImages_[rs]_25-31.py
spiderBody.pensize(40)
spiderBody.circle(20)
# configure the spider legs
legCount = 8
legLength = 90
legAngle = 360 / legCount
spiderBody.pensize(5)
spiderLeg = 0
# draw the spider legs
while (spiderLeg < legCount):
spiderBody.goto(0,20)
spiderBody.setheading(legAngle*spiderLeg)
spiderBody.forward(legLength)
spiderLeg = spiderLeg + 1
spiderBody.hideturtle()
wn = trtl.Screen()
wn.mainloop()
Python Turtle Graphics
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_25-31.py
Ln 16, Col 14 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:11 PM
10/7/2022


File Edit Selection View Go Run Terminal Help
a116_buggyImages_[rs]_29-31.py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs]_1-24.py U
a116_buggyImages_[rs]_25-28.py U
a116_buggyImages_[rs]_29-31.py U
a116_buggyImages_[rs]_1-24.py U
a116_buggyImages_[rs]_25-28.py U
a116_buggyImages_[rs]_29-31.py U
a116_buggyImages_[rs]_29-31.py > ...
7
8 # create a spiderBody
9 spiderBody = trtl.Turtle()
10 spiderBody.pensize(40)
11 spiderBody.circle(20)
12
13 # configure the spider legs
14 legCount = 8
15 legLength = 90
16 legAngle = 180 / legCount
17 spiderBody.pensize(5)
18 spiderLeg = 0
19
20 # draw the spider legs
21
22 while (spiderLeg < legCount):
23 spiderBody.goto(0,20)
24 spiderBody.setheading(legAngle*spiderLeg
25 spiderBody.setheading(legAngle*spiderLeg
26 spiderBody.forward(legLength)
27 spiderLeg = spiderLeg + 1
28 spiderBody.hideturtle()
29
30 wn = trtl.Screen()
31 wn.mainloop()
Python Turtle Graphics
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> &
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> &
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> &
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CS
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
OUTLINE
TIMELINE
main* 0 0 tabnine starter
Ln 23, Col 23 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:16 PM
10/7/2022


File Edit Selection View Go Run Terminal Help
a116_buggyImages_[rs]_29-31.py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs]_1-24.py U
a116_buggyImages_[rs]_25-28.py U
a116_buggyImages_[rs]_29-31.py U
a116_buggyImages_[rs]_1-24.py U
a116_buggyImages_[rs]_25-28.py U
a116_buggyImages_[rs]_29-31.py U
a116_buggyImages_[rs]_29-31.py > ...
22 while (spiderLeg < legCount):
23 spiderBody.goto(0,20)
24 spiderBody.setheading(legAngle*spiderLeg - 30)
25 spiderBody.setheading(legAngle*spiderLeg + 30)
26 spiderBody.forward(legLength)
27 spiderLeg = spiderLeg + 1
28
29 spiderBody.penup()
30
31 spiderBody.goto(15,0)
32 spiderBody.color("white")
33 spiderBody.stamp()
34
35 spiderBody.goto(-20,0)
36 spiderBody.stamp()
37
38 spiderBody.hideturtle()
39
40
41
42 wn = trtl.Screen()
43 wn.mainloop()
Python Turtle Graphics
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/User
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/User
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/User
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CS
P/1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
OUTLINE
TIMELINE
main* 0 0 tabnine starter
Ln 31, Col 19 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:22 PM
10/7/2022


File Edit Selection View Go Run Terminal Help
a116_ladybug_[rs].py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs]_1-24.py
a116_buggyImages_[rs]_25-28.py
a116_buggyImages_[rs]_29-31.py
a116_ladybug_[rs].py U
a116_buggyImages_[rs]_1-24.py
a116_buggyImages_[rs]_25-28.py
a116_buggyImages_[rs]_29-31.py
a116_ladybug_[rs].py U
ladybug.forward(75)
# config dots
num_dots = 1
xpos = -20
ypos = -55
ladybug.pensize(10)
# draw two sets of dots
while (num_dots <= 2):
ladybug.penup()
ladybug.goto(xpos, ypos)
ladybug.pendown()
ladybug.circle(3)
ladybug.penup()
ladybug.goto(xpos + 30, ypos + 20)
ladybug.pendown()
ladybug.circle(2)
# position next dots
ypos += 25
xpos += 5
num_dots += 1
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER COMMENTS
self.cv.tag_raise(lineitem)
File "<string>", line 1, in tag_raise
File "C:\Users\rsharma\AppData\Local\Programs\Python\Python38\l
self.tk.call((self._w, 'raise') + args)
_tkinter.TclError: invalid command name ".!canvas"
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsha
1.1.5/PLTW-1.1.6/a116_ladybug_[rs].py
OUTLINE
TIMELINE
Python Turtle Graphics
main* 0 0 tabnine starter
Ln 46, Col 1 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:41 PM
10/7/2022


File Edit Selection View Go Run Terminal Help
a116_buggyImages_[rs]_29-31.py - PLTW-1.1.6 - Visual Studio Code
EXPLORER
PLTW-1.1.6
.gitattributes
a116_buggyImages_[rs]_1-24.py
a116_buggyImages_[rs]_25-28.py
a116_buggyImages_[rs]_29-31.py M
a116_ladybug_[rs].py U
a116_buggyImages_[rs]_1-24.py
a116_buggyImages_[rs]_25-28.py
a116_buggyImages_[rs]_29-31.py M
a116_ladybug_[rs].py U
while (spiderLeg < legCount):
spiderBody.goto(0,20)
spiderBody.setheading(legAngle*spiderLeg - 30)
spiderBody.setheading(legAngle*spiderLeg + 30)
spiderBody.forward(legLength)
spiderLeg = spiderLeg + 1
spiderBody.penup()
spiderBody.goto(0,-30)
spiderBody.pendown()
spiderBody.pensize(30)
spiderBody.circle(10)
spiderBody.goto(15,-30)
spiderBody.color("white")
spiderBody.pensize(5)
spiderBody.stamp()
spiderBody.penup()
spiderBody.goto(-20,-30)
spiderBody.pendown()
spiderBody.stamp()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER COMMENTS
File "C:\Users\rsharma\AppData\Local\Programs\Python\Python38\lib
self.screen._incrementudc()
File "C:\Users\rsharma\AppData\Local\Programs\Python\Python38\lib
raise Terminator
turtle.Terminator
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharm
1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
PS C:\Users\rsharma\Desktop\CSP\1.1.5\PLTW-1.1.6> & C:/Users/rsharma/AppData/Local/Programs/Python/Python38/python.exe c:/Users/rsharma/Desktop/CSP/
1.1.5/PLTW-1.1.6/a116_buggyImages_[rs]_29-31.py
OUTLINE
TIMELINE
Python Turtle Graphics
main* 0 0 tabnine starter
Ln 44, Col 20 Spaces: 2 UTF-8 CRLF Python 3.8.10 64-bit
Type here to search
70°F Sunny
12:47 PM
10/7/2022