

Homework Assignment

Week 13: Python Turtle Graphics

Total Points: 100 — Due: Next Class



Name: _____

Date: _____

Lab Goals - Final Celebration!

By the end of this lab, you will be able to:

- Create beautiful art using Python Turtle Graphics
- Apply loops to make stunning patterns
- Combine all your programming skills in creative ways
- Build confidence as a Python programmer
- Have fun celebrating your learning journey!

Getting Started

1. Open Thonny on your computer
2. Create a new file called `week13_celebration_lab.py`
3. Save it in your CS folder
4. Type your name and your partner's name as comments at the top
5. Get ready to create amazing art!

1 Exercise 1: Let's Draw a Colorful Star! (8 minutes)

Type this code exactly as shown and run it:

```
1 # Exercise 1: Celebration Star
2 from turtle import *
3
4 speed(5)
5 color("gold")
6
7 # Draw a 5-pointed star
8 for i in range(5):
9     forward(100)
10    right(144)
11
12 # Add your signature
13 penup()
14 goto(0, -120)
15 color("purple")
16 write("Made by [Your Name]", align="center", font=("Arial", 12, "bold"))
17
18 done()
```

✔ **Checkpoint:** Show your teacher your golden star before moving on!

Now modify the code:

- Change the color to your favorite color
- Make the star bigger by changing forward(100) to forward(150)
- Change the number of points (try range(8) with right(135))
- Add your actual name in the signature

★ **Celebrate:** You just created your first piece of turtle art! Well done!

2 Exercise 2: Complete the Rainbow Octagon (7 minutes)

Fill in the blanks to create a colorful octagon:

```

1  # Exercise 2: Rainbow Octagon
2  from turtle import *
3
4  speed(8)
5  colors = ["red", "orange", "yellow", "green", "blue", "purple", "pink", "
6          cyan"]
7
8  print("Creating a rainbow octagon...")
9
10 # An octagon has 8 sides
11 for i in range(_____):
12     color(colors[_____]) # Use i to pick color
13     forward(80)
14     right(_____) # Hint: 360 divided by 8
15
16 # Fill the octagon with color
17 penup()
18 goto(0, -50)
19 pendown()
20 color("lightyellow")
21 begin_fill()
22 for i in range(8):
23     forward(_____ )
24     right(45)
25     _____() # Complete the fill
26
27 # Add a message
28 penup()
29 goto(0, 100)
30 color("black")
31 write("Octagon Magic!", align="center", font=("Arial", 16, "normal"))
32 done()

```

Test your octagon:

- Should have 8 sides with different colors
- Should be filled with light yellow
- Each turn should be 45 degrees

✔ **Checkpoint:** Rainbow octagon complete? Beautiful work!

3 Exercise 3: Experiment with Turtle Stamps (10 minutes)

👥 **Pair Programming:** Switch who types every 5 minutes!

Let's create a fun stamp pattern:

Step 1: Start with this code:

```

1 # Exercise 3: Stamp Art
2 from turtle import *
3
4 speed(0) # Fastest speed
5 shape("turtle") # Show turtle shape
6
7 # Create a circle of turtle stamps
8 for i in range(12):
9     penup()
10    forward(80)
11    stamp()
12    backward(80)
13    right(30)
14
15 hideturtle()
16 done()
    
```

Step 2: Try these experiments (run after each change):

1. What happens if you add `color("blue")` before the stamp?
Result: _____
2. What happens if you change the shape to `shape("circle")`?
Result: _____
3. Can you make each stamp a different color using a list of colors?
Hint: Create a colors list and use `colors[i % len(colors)]`

💡 **Tip:** The `stamp()` function leaves a copy of the turtle's shape at the current position!

4 Exercise 4: Fix the Balloon Drawing (8 minutes)

This balloon code has 4 errors. Work with your partner to fix them:

```

1 # Exercise 4: Birthday Balloons - Fix me!
2 from turtle import *
3
4 speed(5)
5
6 # Draw first balloon
7 color("red) # Error 1: Missing quote
8 beginfill() # Error 2: Should be begin_fill()
9 circle(50)
10 end_fill()
11
12 # Draw balloon string
13 right(90)
14 forward(100)
    
```

```

15
16 # Move to second balloon position
17 penup()
18 goto(100, 0)
19 pen_down() # Error 3: Should be pendown()
20
21 # Draw second balloon
22 color("blue")
23 begin_fill()
24 circle(50)
25 end_fill()
26
27 # Draw string
28 write(90) # Error 4: Should be right(90)
29 forward(100)
30
31 # Add birthday message
32 penup()
33 goto(50, -150)
34 write("Happy Coding!", align="center", font=("Arial", 16, "bold"))
35
36 done()

```

Hints:

- Line 6: Check the quotation marks
- Line 7: Check the function name spelling
- Line 12: Missing something at the end
- Line 17: Wrong function name
- Line 25: Wrong function - should turn, not write

✔ **Checkpoint:** Fixed balloons floating properly? Excellent debugging!

5 Exercise 5: Create a ZigZag Pattern (8 minutes)

Fill in the blanks to create a colorful zigzag:

```

1 # Exercise 5: ZigZag Rainbow
2 from turtle import *
3
4 speed(0)
5 colors = ["red", "blue", "green", "orange", "purple"]
6 pensize(3)
7
8 print("Drawing a zigzag pattern...")
9
10 # Start from left side of screen
11 penup()
12 goto(-200, 0)
13 pendown()
14
15 # Draw 10 zigzag segments
16 for i in range(10):
17     color(colors[_____ % _____]) # Cycle through colors
18

```

```

19     # Zig up
20     left(_____) # Turn 45 degrees
21     forward(50)
22
23     # Zag down
24     right(_____) # Turn 90 degrees to go down
25     forward(50)
26
27     # Return to horizontal
28     left(45)
29
30 # Add a fun message
31 penup()
32 goto(0, -100)
33 color("black")
34 write("ZigZag Complete!", align="center")
35
36 done()

```

Your zigzag should:

- Go up and down across the screen
- Change colors for each segment
- Have thick lines (pensize 3)

✔ **Checkpoint:** Colorful zigzag pattern working? Nice job!

6 Exercise 6: What Will This Draw? (5 minutes)

Before running this code, predict what it will create:

```

1 from turtle import *
2
3 speed(8)
4 bgcolor("lightblue")
5
6 # Mystery pattern
7 for i in range(4):
8     color("white")
9     begin_fill()
10    circle(30)
11    end_fill()
12
13    penup()
14    forward(60)
15    pendown()
16
17 penup()
18 goto(0, -80)
19 color("green")
20 pendown()
21
22 begin_fill()
23 for i in range(4):
24     forward(240)
25     right(90)

```

```
26 end_fill()
27
28 done()
```

Your prediction: _____

Now run it. Actual output: _____

Were you correct? Yes No

What does this scene represent? _____

7 Exercise 7: Fireworks Display (12 minutes)

Create a simple fireworks animation:

```
1  # Exercise 7: Fireworks Celebration
2  from turtle import *
3
4  speed(0)
5  bgcolor("midnightblue")
6
7  print("Launching fireworks...")
8
9  # Function to draw one firework burst
10 def draw_burst(x, y, burst_color):
11     penup()
12     goto(x, y)
13     pendown()
14     color(burst_color)
15
16     # Draw lines radiating out
17     for i in range(12):
18         pendown()
19         forward(40)
20         stamp() # Leave a dot at the end
21         backward(40)
22         right(30)
23
24 # Your code: Draw at least 3 firework bursts
25 # Burst 1
26 draw_burst(0, 100, "red")
27
28 # Burst 2 - you add this
29 draw_burst(_____, _____, "yellow")
30
31 # Burst 3 - you add this
32 -----
33
34 # Add more bursts with different colors and positions!
35
36 # Celebration message
37 penup()
38 goto(0, -200)
39 color("white")
40 write("Congratulations Python Programmers!", align="center",
41       font=("Arial", 18, "bold"))
42
43 done()
```

Make your fireworks display special by:

- Adding at least 3 more bursts

- Using different colors (gold, orange, pink, cyan)
- Placing them at different positions
- Maybe add some ground or other decorations

Tip: Try negative y-values for lower fireworks, and spread them across x-axis!

8 Exercise 8: Mini-Challenge - Create Your Signature Pattern (15 minutes)

Create your own unique pattern that represents YOU!

Requirements:

1. Use at least one loop
2. Include at least 3 different colors
3. Add your name or initials somewhere
4. Make it personal - what represents you?

Ideas to inspire you:

- Your favorite sport (football, cricket bat, basketball)
- Your initials in creative style
- Pattern inspired by your favorite thing
- Abstract art that represents your personality
- Something from Pakistani culture (truck art patterns, henna designs)

Starter Template:

```

1  # My Signature Pattern
2  # By: [Your Name]
3  from turtle import *
4
5  speed(5)
6  bgcolor("white") # Or choose your background
7
8  # Your creative code here!
9  # Remember:
10 # - Use loops to avoid repetition
11 # - Try different shapes and colors
12 # - Make it unique to you!
13
14 # Don't forget to sign your artwork!
15 penup()
16 goto(0, -250)
17 color("black")
18 write("Created by [Your Name]", align="center", font=("Arial", 12, "normal")
19      )
20 done()
    
```

 **Pair Programming:** Switch who types every 5 minutes!

 **Celebrate:** This is YOUR moment to shine! Show off your creativity and all the skills you've learned!

 **Checkpoint:** Signature pattern complete? Can't wait to see it in the gallery!

9 Lab Summary

 **Checkpoint:** Final checkpoint - make sure you have:

- Completed all exercises with your partner
- Saved your file as `week13_celebration_lab.py`
- Created at least one piece of art you're proud of
- Added your name/signature to your creations
- Helped your partner when they needed it
- Had fun celebrating your programming journey!

Reflection - Your Programming Journey (3 minutes)

Rate your growth this semester:

Skill	 Week 1	 Midway	 Now!
Writing Python code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using loops effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Debugging programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating with code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My favorite creation today: _____

One thing I want to create next: _____

Message to next year's students: _____

Gallery Preparation

Choose your **BEST** creation from today's lab for the Loop Art Gallery!

Selected piece: _____

Why I'm proud of it: _____

 **Congratulations, Python Programmer!** 

You've completed Module 1: Foundations of Programming!

From Scratch blocks to Python masterpieces - what an incredible journey!

 **Keep coding, keep creating, keep growing!** 