

WELCOME TO

TECHNOVATION N

Week 4 - October 15



MICHIGAN STATE UNIVERSITY

Agenda

- Spotlight
- Review Week:
 - Food loops
- New Material:
 - Functions
- Coding challenges
- Attendance and Temperature Check

Spotlight Video!

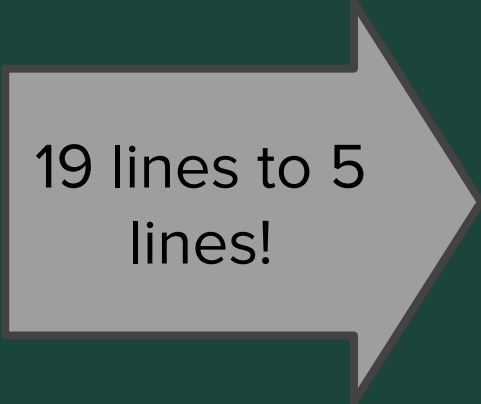


- What kind of games do you guys enjoy?
- What kind of game would you make?
- Do you think computer science will further improve games and the gaming industry?

Reviewing Loops!

For loops help us by:

- shortening our code
- making it easy to alter our code



19 lines to 5
lines!

```
1 circle(20)
2 penup()
3 forward(40)
4 pendown()
5 circle(20)
6 penup()
7 forward(40)
8 pendown()
9 circle(20)
10 penup()
11 forward(40)
12 pendown()
13 circle(20)
14 penup()
15 forward(40)
16 pendown()
17 circle(20)
18 penup()
19 forward(40)
```

```
1 Tracy, repeat this code 5 times!
2   circle(20)
3   penup()
4   forward(40)
5   pendown()
```

Reviewing Loops!

```
1 circle(20)
2 penup()
3 forward(40)
4 pendown()
5 circle(20)
6 penup()
7 forward(40)
8 pendown()
9 circle(20)
10 penup()
11 forward(40)
12 pendown()
13 circle(20)
14 penup()
15 forward(40)
16 pendown()
17 circle(20)
18 penup()
19 forward(40)
```

For loops help us by:

- shortening our code
- making it easy to alter our code

Change
radius to 50
pixels

```
1 Tracy, repeat this code 5 times!
2   circle(20)
3   penup()
4   forward(40)
5   pendown()
```

Writing For Loops

`for i in range (amount of times to repeat):`
Commands to repeat go here (indented!)

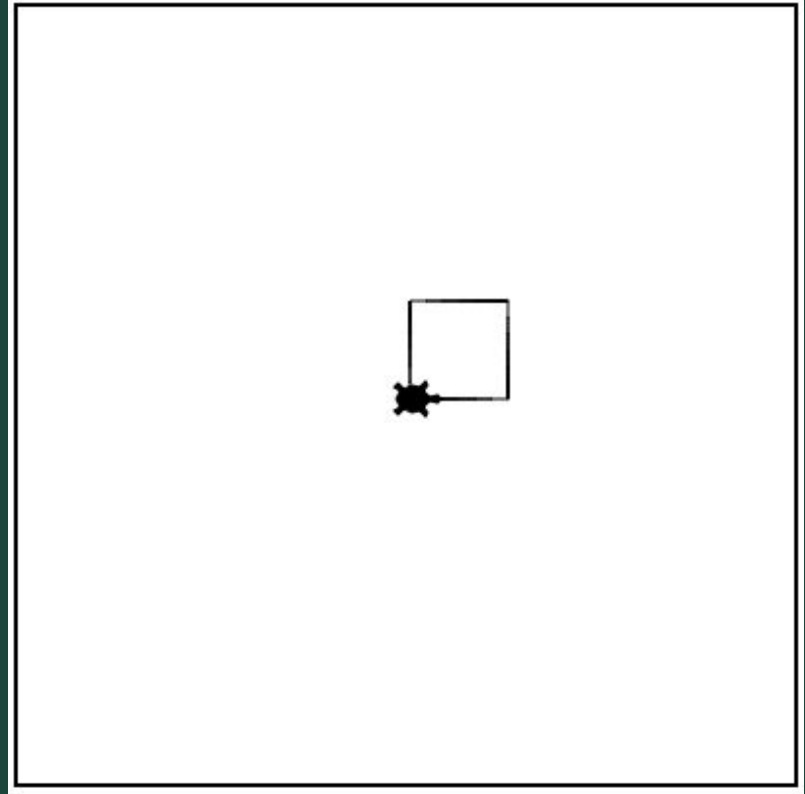
```
1 Tracy, repeat this code 5 times!  
2     circle(20)  
3     penup()  
4     forward(40)  
5     pendown()
```

Write
loop

```
1 for i in range(5):  
2     circle(20)  
3     penup()  
4     forward(40)  
5     pendown()
```

Example #1: Square using for loops

Write a program that has Tracy draw a square with sides of 50 pixels using a for loop.



Example #2: Create a Dashed Line

Using a for loop create a small dashed line across the page. Each dash should be five pixels long with a five pixel gap in between.



Questions?

Look Back at Four Circles

```
1  """
2  This program will draw four circles in a square formation at the center
3  of the canvas. Each circle will have a radius of 50.
4  """
5  speed(5)
6
7  # Move to bottom left of circle group at position (-50,-100)
8  penup()
9  setposition(-50,-100)
10
11 # Draw two circles next to each other
12 for i in range (2):
13     pendown()
14     circle(50)
15     penup()
16     forward(100)
17
18 # Move to top of circle row at position (-50, 0)
19 setposition(-50,0)
20
21 # Draw two circles next to each other
22 for i in range (2):
23     pendown()
24     circle(50)
25     penup()
26     forward(100)
```

Instead, write
a function!

What is a Function

Functions are a way to group a set of commands so they can be called with one line of code.

Functions help us teach Tracy new commands using the ones she already knows!

Why Use Functions

Functions help us by:

- Shortening our code
- Making our code reusable
- Making our code more readable

Defining a Function

```
def function_name_here():  
    function commands here (indented!)
```

Function Name: my_~~function~~

Defining a Function Cont.

```
11 # Draw two circles next to each other
12 for i in range (2):
13     pendown()
14     circle(50)
15     penup()
16     forward(100)
```

```
def function_name_here():
    function commands here
```

Define
function

```
11 # Draw two circles next to each other
12 def draw_two_circles():
13     for i in range (2):
14         pendown()
15         circle(50)
16         penup()
17         forward(100)
```

Calling a Function

```
5 speed(5)
6
7 # This function draws two circles next to each other
8 def draw_two_circles():
9     for i in range (2):
10         pendown()
11         circle(50)
12         penup()
13         forward(100)
14
15 # Move to bottom left of circle group at position (-50,-100)
16 penup()
17 setposition(-50,-100)
18
19 draw_two_circles()
20
21 # Move to top of circle row at position (-50, 0)
22 setposition(-50,0)
23
24 draw_two_circles()
```

To call a function:

function_name()

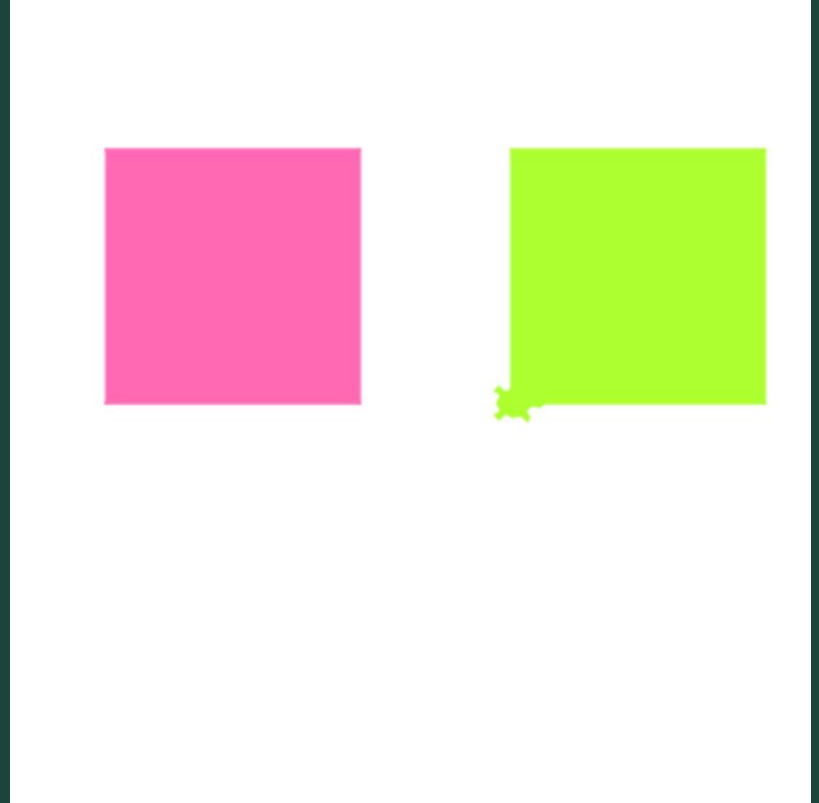
*Reminder! Functions must be defined **before** they are called.

Commands Learned this Lesson

| Command | What does it do? |
|---|---------------------|
| <code>def <i>function_name</i>() :</code> | Declares a function |
| <code><i>function_name</i>()</code> | Calls a function |

Example #2: Colored Boxes

Using functions, create two squares where each side is 125 pixels. Get creative and fill them in with your favorite colors!



Questions?

Coding Time!

- Let's use today to work on the exercises we haven't been able to finish!
- Break into our smaller Coding Rooms
- Work at your own pace! Ask questions!
- If you are all caught up, explore the weekly challenges or the Sandbox in CodeHS

Standup

- Do you want to have short personal sessions to ask questions?
- What was an exercise you worked on today?
- What is something you were successful at?
- What was a challenge you had while coding?

Attendance and Temperature Check

Attendance

Temperature Check