

Iteration with For Loops

Journal

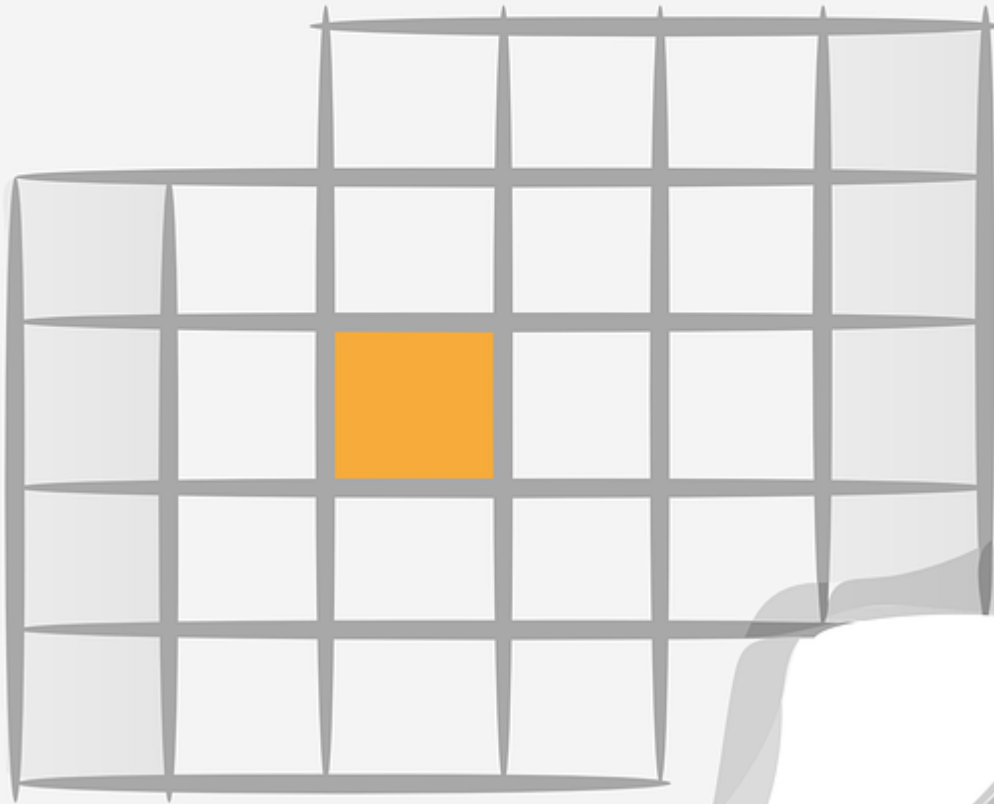
- Students will work through a guided tutorial on `for` loops while being introduced to using turtle graphics in Python.
- Students practice writing programs using `for` loops and turtle graphics.
- Students use their journal as a reflective tool to make a personal connection between iteration and their personal life.

Think about events in your life that require a repeated action. They could be something simple such as eating a bowl of cereal.

List two events in your life that require an action to be repeated. What is the action? What prompts the need for the action to happen? How often does the action happen?



Finish Leap Year Programs

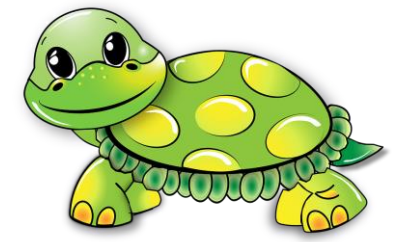


Pseudocode

Act out stacking a set of objects

Write the pseudocode to describe the steps





Demonstration of loops with turtles

The screenshot shows a PyCharm IDE window titled "turtle" with a file named "turtletest.py". The code in the editor is as follows:

```
__author__ = 'Awesome Teacher'  
import turtle # Allows us to use the turtles library  
window = turtle.Screen() # Creates a window for bob so play  
bob = turtle.Turtle() # creates a turtle named bob  
bob.shape("turtle") # Makes bob look like a turtle  
for size in (0, 1, 2, 3, 4, 5, 6, 7, 8, 9): # repeats for each item  
    bob.forward(50) # Moves bob forward 75 units  
    bob.right(95) # Turns bob 100 degrees  
    bob.forward(50) # Moves bob forward 75 units  
window.exitonclick() # Exits the window when clicked
```

The Python Turtle Graphics window on the right shows the result of running the code. It displays a black turtle cursor at the center of a white canvas, surrounded by a series of overlapping, slightly rotated squares, illustrating the effect of the loop.

Step One

```
import turtle
window = turtle.Screen()
bob = turtle.Turtle()
bob.shape("turtle")
bob.forward(250)
bob.right(90)
bob.forward(250)
```

```
# Allows us to use the turtles library
# Creates a window for bob so play
# creates a turtle named bob
# Makes bob look like a turtle
# Moves bob forward 250 units
# Turns bob 90 degrees
# Moves bob forward 250 units
```

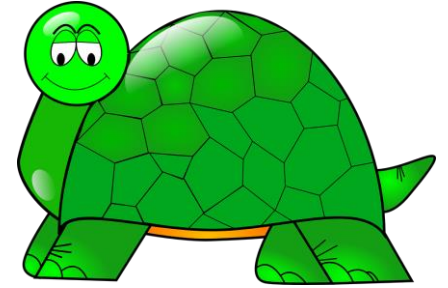


More Efficient

```
import turtle          # Allows us to use the turtles library
window = turtle.Screen() # Creates a window for bob so play
bob = turtle.Turtle()  # creates a turtle named bob
bob.shape("turtle")    # Makes bob look like a turtle
for size in (0, 1, 2, 3, 4, 5, 6, 7, 8, 9): # repeats for each item in the list.
    bob.forward(50)     # Moves bob forward 50 units
    bob.right(95)      # Turns bob 95 degrees
    bob.forward(50)     # Moves bob forward 50 units
window.exitonclick()  # Exits the window when clicked
```



Even More Efficient



```
import turtle          # Allows us to use the turtles library
window = turtle.Screen() # Creates a window for bob so play
bob = turtle.Turtle()   # creates a turtle named bob
bob.shape("turtle")     # Makes bob look like a turtle
for size in range(0, 100): # repeats n times. What is n in this case?
    bob.forward(50)      # Moves bob forward 50 units
    bob.right(95)        # Turns bob 95 degrees
    bob.forward(50)      # Moves bob forward 50 units
window.exitonclick()    # Exits the window when clicked
```


Runestone turtle lessons

Python Turtle Graphics

Hello Little Turtles!

Our First Turtle Program

Instances — A Herd of Turtles

The for Loop

Flow of Execution of the for Loop

Iteration Simplifies our Turtle Program

The range Function

A Few More turtle Methods and Observations

Summary of Turtle Methods

