**Outline**

t.b.d.

**Objectives**

* tbd

**Materials**

* tbd

**Level 0: Teacher Demo of Sample Programs**

1. Sample program #1 is an example of a "Syntax Error". Follow the teacher demo and explain the characteristics of a syntax error. Consider the following criteria:  
   1. Did the program have an error before starting to run?  
      Yes, the program did have an error before starting to run.
   2. Did the program encounter an error before it finished running?  
      Does not apply to this error.
   3. Did the program do what it was supposed to do?

Does not apply to this error.

1. Sample program #2 is an example of a "Run-time Error". Follow the teacher demo and explain the characteristics of a run-time error. Consider the following criteria:  
   1. Did the program have an error before starting to run?  
      No, the program did not have an error before starting to run.
   2. Did the program encounter an error before it finished running?  
      Yes, the program encountered an error before finishing running.
   3. Did the program do what it was supposed to do?

No, the program did not do what it was supposed to do.

1. Sample program #3 is an example of a "Logic Error". Follow the teacher demo and explain the characteristics of a logic error. Consider the following criteria:  
   1. Did the program have an error before starting to run?  
      No, the program did not have an error before starting to run.
   2. Did the program encounter an error before it finished running?  
      No, the program did not encounter an error before it finished running.

* 1. Did the program do what it was supposed to do?

No, the program did not do what it was supposed to do.

**Level 1: Syntax Errors**

1. Research the definition of the word "Syntax". Summarize its meaning below and how it relates to computer languages and programming.

The word “Syntax” refers to words in sentences that are arranged correctly. This relates to computer languages and programming because a program that contains a correct arrangement of computer code is an example of a correct spelled sentence.

1. Research the definition of a "Syntax Error" related to computer programming. Summarize this definition below.

In computer programming, a “Syntax Error “ is a type of error that displays in the beginning of a program when something in the program code does not follow the program requirement.

1. Explain why Sample Program #1 is an example of a "Syntax Error".

Sample program #1 is an example of a “Syntax Error” because it had an error before starting to run.

1. Find and correct the syntax errors in Sample Program #1. Provide a listing of your corrected program below.
   * Use a "#" at the beginning of each line containing an error   
     to "Comment Out" the bad code
   * List the corrected code line underneath the commented out error line

**Corrected Code For Sample Program #1:**

import turtle

myPen = turtle.Turtle()

circleColors = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

#myPen.down(

myPen.down()

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

circleNumber = 0

for circleIndex in range(3) :

#drawCircle(circleColours[circleNumber])

drawCircle(circleColors[circleNumber])

circleNumber = circleNumber + 1

**Level 2: Run-time Errors**

1. Research the definition of a "Run-time Error" related to computer programming. Summarize this definition below.

A "Run-time Error" is a program error that occurs after the program has started to run.

1. Explain why Sample Program #2 is an example of a "Run-time Error".

Sample Program #2 is an example of a "Run-time Error" because the program began to run and it encountered an error before it finished running.

1. Find and correct the run-time errors in Sample Program #2. Provide a listing of your corrected program below.
   * Use a "#" at the beginning of each line containing an error   
     to "Comment Out" the bad code
   * List the corrected code line underneath the commented out error line

import turtle

myPen = turtle.Turtle()

#I added the line circleNumber = 0 underneath

circleNumber = 0

circleColours = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

myPen.down()

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

circleNumber = 1

for circleIndex in range(4) :

drawCircle(circleColours[circleNumber])

#circleNumber = circleNumber + 1

circleNumber =+ 1

1. Explain the difference between a "syntax error" and a "run-time error".

The difference between the two are that a "syntax error" is an error that occurs before the program starts to run and a "run-time error" is an error that occurs before the program finishes running.

**Level 3: Logic Errors**

1. Research the definition of a "Logic Error" related to computer programming. Summarize this definition below.

A “Logic Error” is a type of error that performs an unexpected behavior in the result of a mistake in the program code without displaying an error.

1. Explain why Sample Program #3 is an example of a "Logic Error".

Sample program #3 is an example of a “Logic Error” because an unexpected behavior occurred from the result of a mistake in the program code and no error was displayed by Python.

1. Find and correct the logic errors in Sample Program #3. Provide a listing of your corrected program below.
   * Use a "#" at the beginning of each line containing an error   
     to "Comment Out" the bad code
   * List the corrected code line underneath the commented out error line

import turtle

myPen = turtle.Turtle()

circleColours = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

myPen.down()

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

numOfCircles = 3

#for circleIndex in range(2) :

for circleIndex in range(3) :

circleNumber = numOfCircles - circleIndex - 1

drawCircle(circleColours[circleNumber])

1. Explain the difference between a "logic error" and a "syntax error".

The difference between the two are that a "logic error" is an error that does not display an error in the console and it does not do what it is supposed to do. A "syntax error" is an error that occurs before the program begins to start running.

1. Explain the difference between a "logic error" and a "run-time error".

The difference between the two are that a "logic error" is not shown as an error in the console and it does not do what it is supposed to do. A "run-time error" is an error that is displayed after the program has started running .

**Level 4: Your Sample Program**

1. Create a sample program to show the different types of programming errors. Provide your program listing below.
   * Your program must be of your own design and must be different from the sample programs provided in this module.
   * Your program must contain at least one example of each of: a syntax error, a run-time error, and a logic error.
   * Provide the corrected code in a comment underneath the error code (using a "#" at the beginning of the comment line).

Program 1 Syntax Error:

import turtle

#myPen = turtle.Turtle(

myPen = turtle.Turtle()

for i in range (3) :

myPen.forward(20)

myPen.left(60)

for i in range (3) :

myPen.forward(25)

myPen.left(60)

for i in range (3) :

myPen.forward(30)

myPen.left(60)

for i in range (3) :

myPen.forward(35)

myPen.left(60)

for i in range (3) :

myPen.forward(40)

myPen.left(60)

for i in range (3) :

myPen.forward(45)

myPen.left(60)

for i in range (3) :

myPen.forward(50)

myPen.left(60)

for i in range (3) :

myPen.forward(55)

myPen.left(60)

Program 2 Run-Time Error:

import turtle

myPen = turtle.Turtle()

for i in range (3) :

myPen.forward(20)

myPen.left(60)

for i in range (3) :

myPen.forward(25)

myPen.left(60)

for i in range (3) :

myPen.forward(30)

myPen.left(60)

for i in range (3) :

myPen.forward(35)

#myPen.lef(60)

myPen.left(60)

for i in range (3) :

myPen.forward(40)

myPen.left(60)

for i in range (3) :

myPen.forward(45)

myPen.left(60)

for i in range (3) :

myPen.forward(50)

myPen.left(60)

for i in range (3) :

myPen.forward(55)

myPen.left(60)

Program 2 Logic Error:

import turtle

myPen = turtle.Turtle()

posX = 0

posY = 0

pixelAddress = 0

pixelMemory = [

(15,15,5),(13,13,6),(8,10,3),(23,21,10),(32,33,16),(33,52,22),(32,54,21),(25,42,17),

(21,19,17),(20,18,9),(7,7,6),(58,65,11),(42,47,7),(11,8,6),(24,25,8),(21,28,10),

(25,19,5),(16,13,8),(28,28,12),(191,192,18),(205,202,21),(42,42,14),(11,11,4),(16,11,3),

(34,59,10),(35,47,15),(24,35,12),(156,139,26),(154,140,22),(28,43,10),(9,12,1),(19,22,5),

(42,88,15),(48,94,18),(98,120,49),(213,195,123),(109,134,66),(44,91,15),(52,86,22),(43,85,18),

(50,95,13),(63,104,39),(224,213,156),(255,225,140),(120,153,92),(41,99,17),(58,103,28),(42,98,17),

(35,86,13),(71,105,42),(223,208,144),(216,204,146),(100,134,82),(28,87,3),(39,83,12),(32,80,12),

(49,102,29),(57,109,33),(92,125,53),(66,103,36),(29,66,13),(32,76,17),(48,91,26),(47,93,23)

]

def drawPixel(rgb) :

global posX

myPen.down()

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(18)

posX = posX + 18

def newRow() :

global posX

global posY

myPen.up()

myPen.left(180)

myPen.forward(posX)

myPen.left(90)

myPen.forward(18)

myPen.left(90)

myPen.down()

posX = 0

posY = posY + 18

for row in range (4) :

for column in range(12) :

drawPixel(pixelMemory[pixelAddress])

pixelAddress -= 1

#newRow()

newRow()

**SAMPLE PROGRAM #1 - Syntax Error**

import turtle

myPen = turtle.Turtle()

circleColors = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

myPen.down(

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

circleNumber = 0

for circleIndex in range(3) :

drawCircle(circleColours[circleNumber])

circleNumber = circleNumber + 1

**SAMPLE PROGRAM #2 - Run-time Error**

import turtle

myPen = turtle.Turtle()

circleColours = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

myPen.down()

myPen.color(rgb)

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

circleNumber = 1

for circleIndex in range(4) :

drawCircle(circleColours[circleNumber])

circleNumber = circleNumber + 1

**SAMPLE PROGRAM #3 - Logic Error**

import turtle

myPen = turtle.Turtle()

circleColours = [(196,196,0),(196,0,196),(0,196,196)]

def drawCircle(rgb) :

myPen.down()

myPen.begin\_fill()

myPen.circle(8)

myPen.end\_fill()

myPen.up()

myPen.forward(22)

numOfCircles = 3

for circleIndex in range(2) :

circleNumber = numOfCircles - circleIndex - 1

drawCircle(circleColours[circleNumber])