**Brandon Donato 10/1/15**

'''

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CS 110 - B57

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assignment4Ex1

'''

#The getX and getSinX functions are fruitful functions.

#They need return statements because they have numeric values.

#Having global constants are important because if they occur multiple \

#times, they are easy to adjust.

#The values are used when creating the screen, axis and \

#when plotting the graph.

import math

import turtle

MAX\_X = 2\*math.pi

MAX\_Y = 1

CONSTANT\_0 = 0

CONSTANT\_1 = 1

CONSTANT\_2 = 2

CONSTANT\_360 = 360

CONSTANT\_PI = math.pi

def setUpWindow(screenObject):

screenObject.setworldcoordinates(-CONSTANT\_1,-CONSTANT\_2,MAX\_X,MAX\_Y)

screenObject.bgcolor('lightblue')

def getX(degrees):

radianAngle = math.radians(degrees)

return radianAngle

def getSinX(degrees):

return math.sin(getX(degrees))

def setUpTurtle(turtle):

turtle.goto(-CONSTANT\_PI,CONSTANT\_0)

turtle.goto(MAX\_X,CONSTANT\_0)

turtle.penup()

turtle.goto(CONSTANT\_0,CONSTANT\_2)

turtle.pendown()

turtle.goto(CONSTANT\_0,-CONSTANT\_2)

turtle.goto(CONSTANT\_0,CONSTANT\_0)

def drawSinCurve(turtleObject):

for angle in range(CONSTANT\_0,(CONSTANT\_360 + CONSTANT\_1)):

x = math.radians(angle)

y = math.sin(getX(angle))

turtleObject.goto(x,y)

def main():

sn = turtle.Screen()

fred = turtle.Turtle()

setUpWindow(sn)

setUpTurtle(fred)

drawSinCurve(fred)

main() **Page 1 of 3**

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assignment4Ex2

'''

#The getX function is the same in both programs because it converts angles \

#to radians.The setUpTurtle function and the global constants are also \

#the same. It's easier to re-use a function I've created than make \

#a new one.

#I'm re-using the getX function, the setUpTurtle function as well as \

#nearly the same body to the drawSinCurve function with minor \

#modifications to accomodate to the cosine function.This inherently \

#means the main function will be extremely similar.

#The difference between this program and the other will that this function \

#will return the cosine of some inputted value. The graph will also be \

#drawn differently because its a different graph.

import math

import turtle

MAX\_X = 2\*math.pi

MAX\_Y = 1

CONSTANT\_0 = 0

CONSTANT\_1 = 1

CONSTANT\_2 = 2

CONSTANT\_360 = 360

CONSTANT\_PI = math.pi

def getX(degrees):

radianAngle = math.radians(degrees)

return radianAngle

def setUpWindow(screenObject):

screenObject.setworldcoordinates(-CONSTANT\_1,-CONSTANT\_2,MAX\_X,MAX\_Y)

screenObject.bgcolor('lightblue')

def setUpTurtle(turtle):

turtle.goto(-CONSTANT\_1\*CONSTANT\_PI,CONSTANT\_0)

turtle.goto(MAX\_X,CONSTANT\_0)

turtle.penup()

turtle.goto(CONSTANT\_0,CONSTANT\_2)

turtle.pendown()

turtle.goto(CONSTANT\_0,-CONSTANT\_2)

turtle.goto(CONSTANT\_0,CONSTANT\_0)

def getCosX(degrees):

return math.cos(getX(degrees))

def drawCosCurve(turtleObject):

for angle in range(CONSTANT\_0,(CONSTANT\_360 + CONSTANT\_1)):

x = math.radians(angle)

y = math.cos(getX(angle))

turtleObject.goto(x,y)

def main():

sn = turtle.Screen()

fred = turtle.Turtle()

setUpWindow(sn)

setUpTurtle(fred)

drawCosCurve(fred)

main() **Page 2 of 3**

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assignment4Ex3

'''

#Using a setUpTurtle function is the same as the first two programs.\

#The fact that the program outputs a graph is also the same.

#I can reuse the body of the drawSinCurve function and modify it to \

#accomodate to the logarithmic function.I can also use the setUpWindow \

#function and the main function accomodated to fit the logarithmic curve.

#My final y value is 11 because the log2(2048) = 11.

import math

import turtle

MAX\_X = 2048

MAX\_Y = 12

CONSTANT\_0 = 0

CONSTANT\_2 = 2

CONSTANT\_1 = 1

def setUpWindow(screenObject):

screenObject.setworldcoordinates(CONSTANT\_0,-CONSTANT\_1,MAX\_X,MAX\_Y)

screenObject.bgcolor('lightblue')

def setUpTurtle(turtle):

turtle.goto(CONSTANT\_0,CONSTANT\_0)

turtle.goto(MAX\_X,CONSTANT\_0)

turtle.penup()

turtle.goto(CONSTANT\_0,CONSTANT\_2)

turtle.pendown()

turtle.goto(CONSTANT\_0,-CONSTANT\_2)

turtle.goto(CONSTANT\_0,CONSTANT\_0)

def drawLogCurve(turtleObject):

for angle in range(CONSTANT\_1,(MAX\_X+CONSTANT\_1)):

x = angle

y = math.log(angle,CONSTANT\_2)

turtleObject.goto(x,y)

def log(xValue):

return math.log(xValue,CONSTANT\_2)

def main():

sn = turtle.Screen()

fred = turtle.Turtle()

setUpWindow(sn)

setUpTurtle(fred)

drawLogCurve(fred)

main()

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