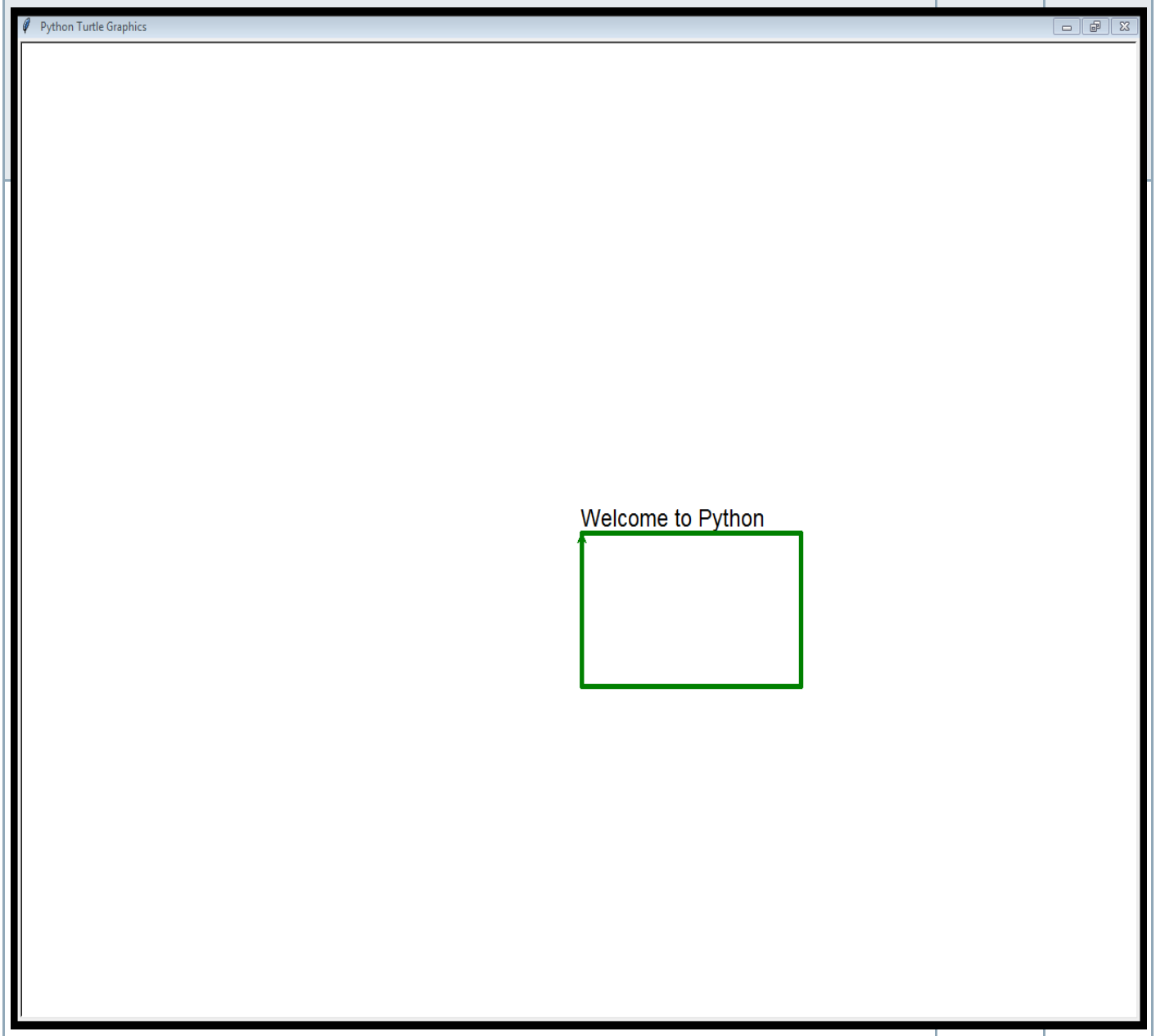
SAMPLE – PYTHON GRAPHICS

Description: The purpose of this assignment is to explore some of the graphic features of Python. You will study several of the attached sample programs to explore the different graphic features of Python	Score	Your Score
Chapters 2 -6 contains quite a bit of other examples.		
1. ☐ Also study the following examples carefully and make sure you understand how to create your own design or update a graphical design.		
SAMPLE 1 (Rectangle)		

```
# Programmer:   Prof. Parham
# Program Name: Sample 1 Graphics in Python
# Date Written: October 15, 2013
#
# Illustrating some of the basic methods and functions used with the turtle module/library
# This Python sample program draws a square shape with a welcome message at the top of the square.
#
#=================================================================================================
import turtle; ''' This command imports all functions defined in the turtle module
                  and makes them available for you to use. '''

turtle.showturtle(); # displays current location and direction of the turtle (prompt)

turtle.write("Welcome to Python ", font=("Arial", "18", "normal"));'''defines the font size and type,
                                                                      size before writing message'''

turtle.color("green"); # defines line color of design as green

turtle.width(5); # defines width of line color

turtle.forward(250); # moves the turtle forward 250 pixels

turtle.right(90); # moves turtle right 90 degrees (angle)

turtle.forward(150); # moves turtle forward 150 pixels

turtle.right(90); # moves turtle right 90 degrees (angle)

turtle.forward(250); # moves the turtle forward 250 pixels

turtle.right(90); # moves turtle right 90 degrees (angle)

turtle.forward(150); # moves turtle forward 150 pixels
#=================================================================================================
#End Program
```

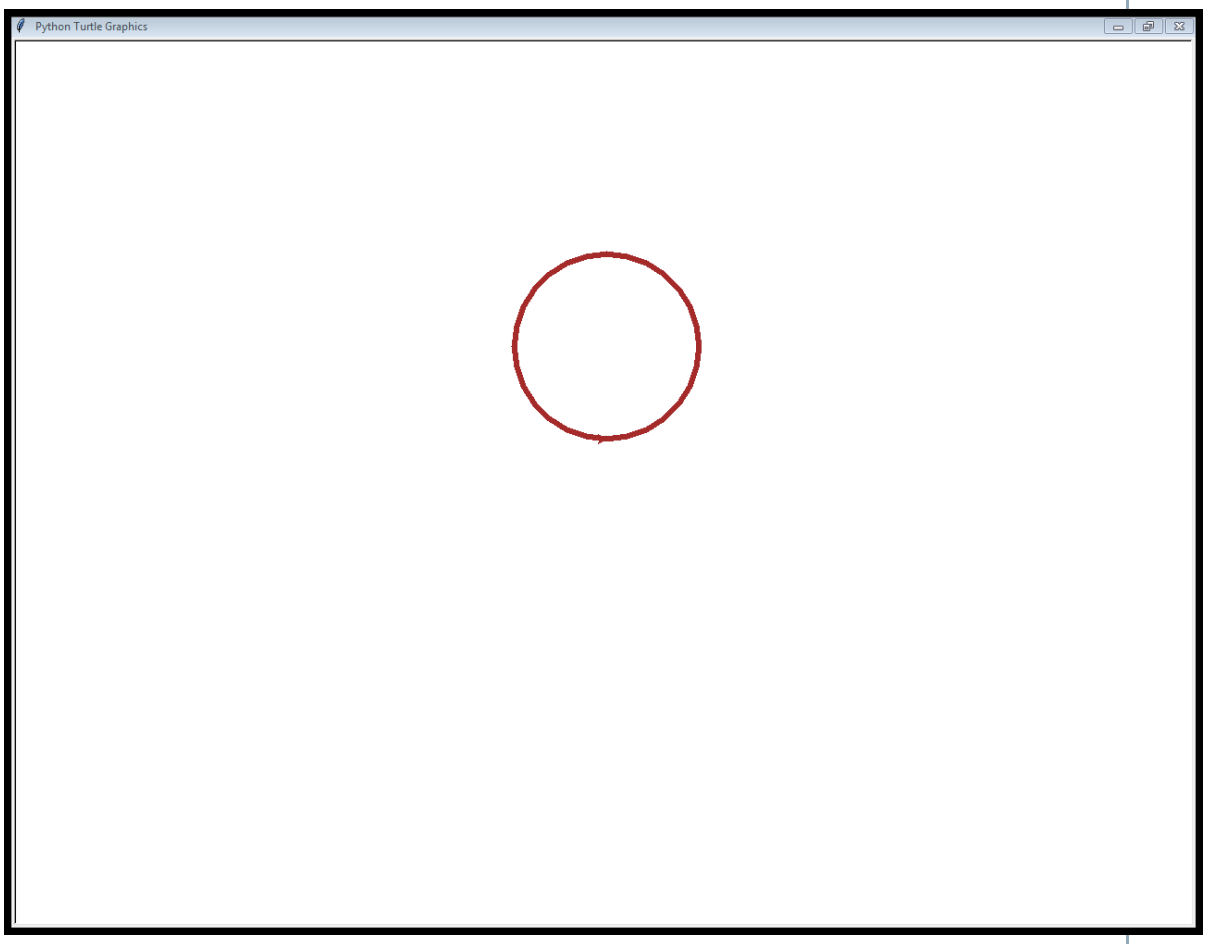
OUTPUT FROM SAMPLE 1 *(draw a rectangle)*



SAMPLE 2 (CIRCLE)

```
# Programmer:   Prof. Parham
# Program Name: Sample 2 - Drawing a Circle
# Date Written: October 15, 2013
#
# Draws a Circle displaying in the color RED
# Moving the pen to any location using the goto(x, y) function
# Using the penup(); pendown();

#=============================================================================
import tkinter; # built in GUI for creating graphics in python
import turtle;  # built in module for creating basic graphical designs

turtle.penup();
turtle.goto(0,50); # Moves turtle to absolute screen position 0, 50
turtle.pendown();
turtle.color("brown");
turtle.pensize(6);
turtle.circle(100); # Draw a circle with radius 100

# The statements below creates animation effect and the circle disappears
turtle.mode("logo");
turtle.colormode(255);
turtle.speed(0);

# End Program
```

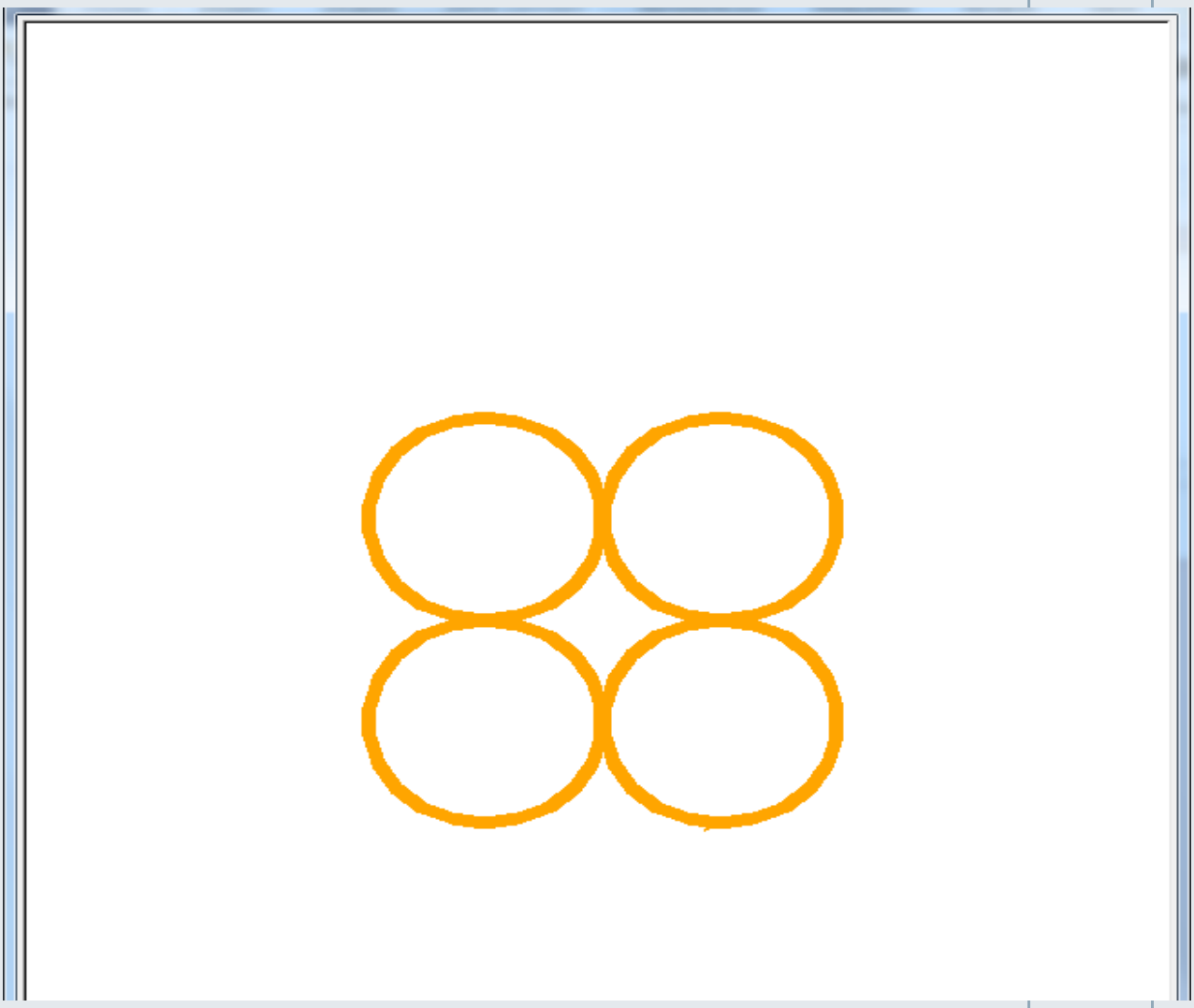
OUTPUT FROM SAMPLE 2 *(draw one circle)*



SAMPLE 3 (Drawing four circles)

```
# Programmer:   Prof. Parham
# Program Name: Sample 3 - Drawing 4 circles
# Date Written: October 15, 2013
#
# Sample Graphics drawing four different circles
# This program draws and connects 4 circles together
#=============================================================================
import turtle;

radius = eval(input("Enter radius (numeric value between (20-100): "));

# draws 1st circle
turtle.color("orange");
turtle.pensize(8);
turtle.penup();
turtle.goto(-radius, 0);
turtle.pendown();
turtle.circle(radius);

# draws 2nd circle immediately below or at the bottom of the first circle
turtle.penup();
turtle.goto(-radius, -2 * radius);
turtle.pendown();
turtle.circle(radius);

# draws 3rd circle immediately to the right of the first circle
turtle.penup();
turtle.goto(radius, 0);
turtle.pendown();
turtle.circle(radius);

# draws 4th circle immediately below the 3rd circle
turtle.penup();
turtle.goto(radius, -2 * radius);
turtle.pendown();
turtle.circle(radius);

input("Press any key to exit...")
#============================================================
# End program
```

OUTPUT FROM SAMPLE *3 (draw four circles)*



SAMPLE 4 (Four Hexagons)

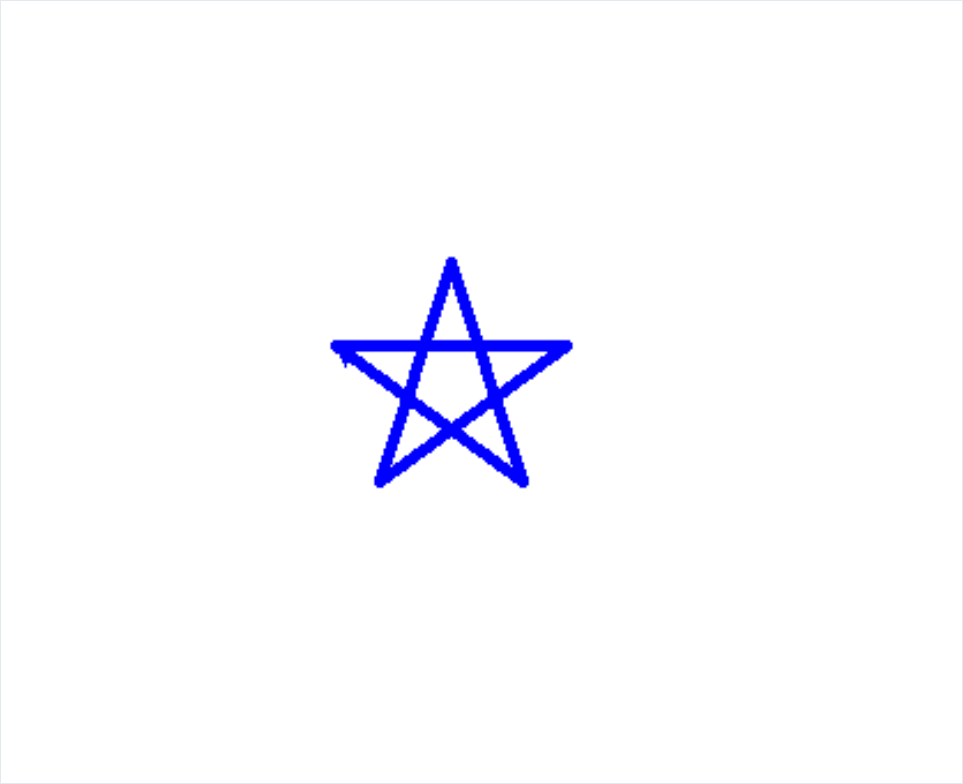
```
#=====================================================================
# Programmer:    Prof. Parham
# Program Name: Sample 4 - Drawing 4 Hexagon shapes
# Date Written: October 15, 2013
#
# Sample Graphics drawing four different hexagons
# This program draws 4 different hexagon (6 sided shapes)

#=====================================================================

import turtle
turtle.pensize(6);
turtle.color("teal");

# Draws 1st hexagon shape
turtle.penup()
turtle.goto(-50, 0)
turtle.pendown()
turtle.circle(50, steps = 6)

# Draws 2nd hexagon shape at bottom of first one
turtle.penup()
turtle.goto(-50, -100)
turtle.pendown()
turtle.circle(50, steps = 6)

# Draws 3rd hexagon shape to the right of the first one
turtle.penup()
turtle.goto(50, 0)
turtle.pendown()
turtle.circle(50, steps = 6)

# Draws 4th hexagon at bottom of 3rd shape
turtle.penup()
turtle.goto(50, -100)
turtle.pendown()
turtle.circle(50, steps = 6)

input("Press any key to exit...")
#=============================================================
#End Program
```

OUTPUT FROM SAMPLE *4(draw four hexagons)*

SAMPLE 5 (5-point Star)

```
#=========================================================================
# Programmer:   Prof. Parham
# Program Name: Sample 5 - Drawing 5-Point Star
# Date Written: October 15, 2013
#=========================================================================
import turtle;
turtle.width(5);
turtle.color("blue");
turtle.forward(100);
turtle.right(144);
turtle.forward(100);
turtle.right(144);
turtle.forward(100);
turtle.right(144);
turtle.forward(100);
turtle.right(144);
turtle.forward(100);

#=========================================================================
#End Program
```

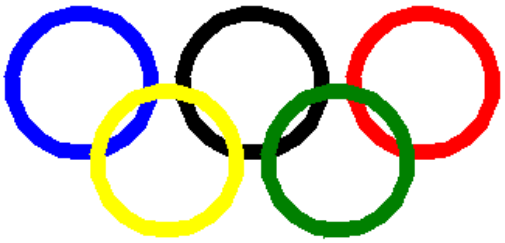
OUTPUT FROM SAMPLE 5 *(Draw 5-Point Star)*



SAMPLE 6 (Olympic Rings Logo)

```
# Drawing the Olympic Rings Logo
#================================================================================
import turtle
turtle.width(10); # Changes pixels to a more pronounced, well defined display
turtle.color("blue");
turtle.penup();
turtle.goto(-110, -25);
turtle.pendown();
turtle. circle(45);

turtle.color("black");
turtle.penup();
turtle.goto(0, -25);
turtle.pendown();
turtle.circle(45);()

turtle.color("red");
turtle.penup();
turtle.goto(110, -25);
turtle.pendown();
turtle.circle(45);

turtle.color("yellow");
turtle.penup();
turtle.goto(-55, -75);
turtle.pendown();
turtle.circle(45);

turtle.color("green");
turtle.penup();
turtle.goto(55, -75);
turtle.pendown();
turtle.circle(45);

#================================================================================
# End
```

OUTPUT FROM SAMPLE 6 *(Olympic Rings Logo)*



SAMPLE 7 (Smiley Face)

```
# This program draws a smiley face in the color purple
from turtle import *
import time;
speed(5);  # draw fast (to make faster increase number)!

#right side of face
import turtle;

turtle.color("purple");
turtle.width(10); # Changes pixels to a more pronounced, well defined display
penup();
forward(75);

#================================================================
#draw an eye
pendown();
right(90);
circle(25);
circle(10);

#================================================================
#left side of face
penup();
right(90);
forward(150);

#================================================================
#draw an eye
pendown();
right(90);
circle(25);
circle(10);

#================================================================
#center and down
penup();
right(90);
forward(75);
right(90);
forward(50);

#================================================================
```

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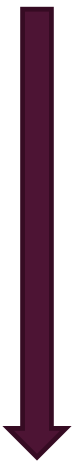


SAMPLE 7 (Smiley Face Continued)

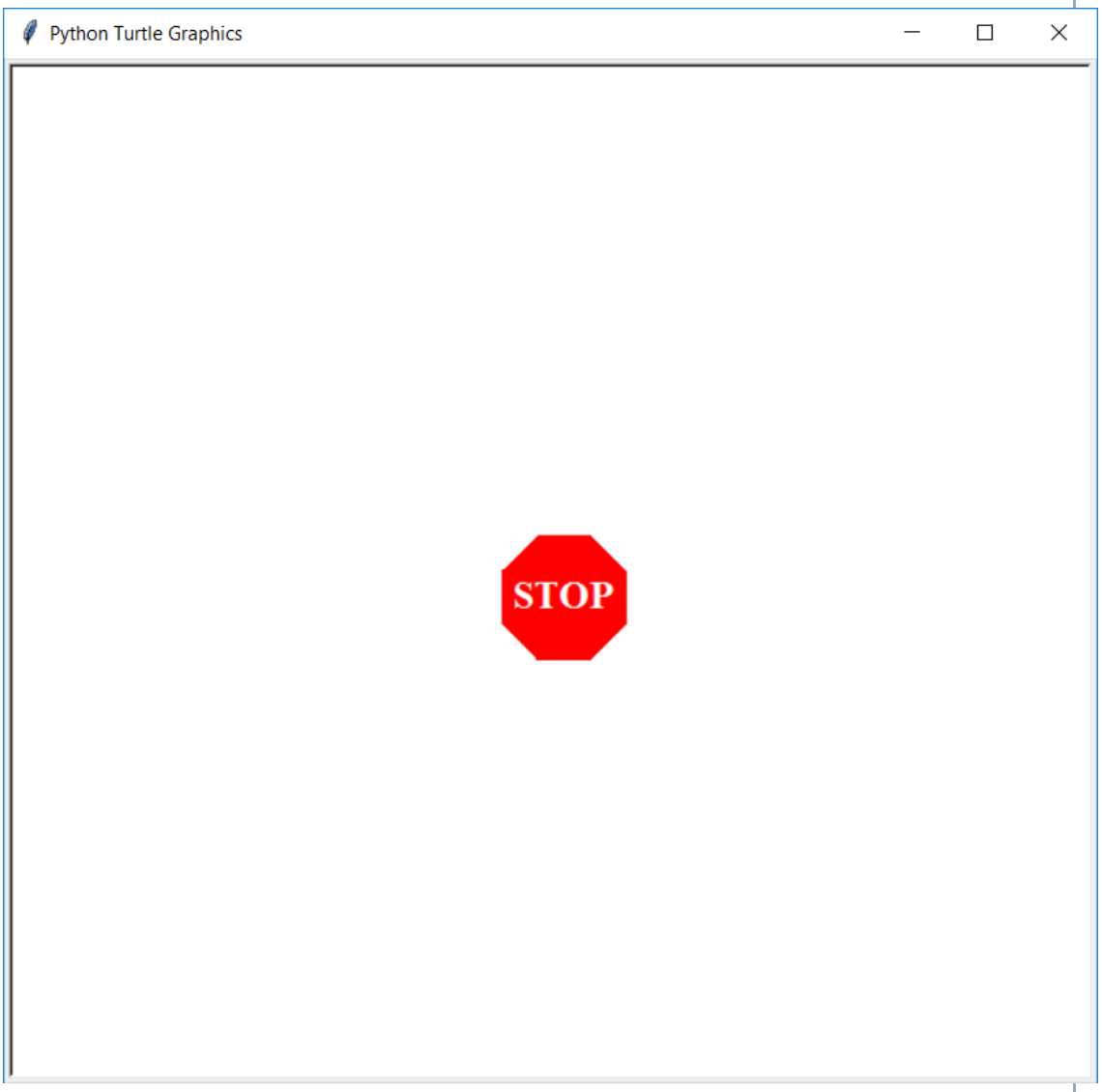
```
#================================================================
#draw a nose
pendown();
left(45);
forward(40);
right(135);
forward(56.56);
right(135);
forward(40);

#================================================================
#center, down, then 100 left
penup();
right(135);
forward(50);
right(90);
forward(100);
left(90);  # need to face east

#================================================================
#smile
pendown();
circle(100, 180);

#================================================================
time.sleep(3); # hold for 3 seconds so we can see

#================================================================

# End Program
```

OUTPUT FROM SAMPLE 7 *(Smiley Face)*

SAMPLE 8 (STOP sign)

```
#=====================================================================
# Programmer:   Prof. Parham
# Program Name: Sample 8 Drawing a stop sign (8-sided shape)
# Date WRitten: January 29, 2017
#
# This program draws a Traffic STOP sign
#=====================================================================

import turtle;

turtle.pensize(3);      # Set pen thickness to 3 pixels

turtle.penup();
turtle.goto(20, -50);
turtle.pendown();
turtle.begin_fill();     # Begin to fill color in a shape
turtle.color("red");
turtle.setheading(22);
turtle.circle(40, steps = 8) # Draw an Octagon
turtle.end_fill(); # Fill the shape

turtle.color("white");
turtle.penup();
turtle.goto(-25, -25);
turtle.pendown();
turtle.write("STOP", font = ("Times", 18, "bold"));
turtle.hideturtle();

turtle.done();
#=====================================================================
# End Program
```

OUTPUT FROM SAMPLE 8 *(STOP SIGN)*



SAMPLE 9 (Cool Colorful Shapes)

```
#=============================================================================
# Programmer:    Prof. Parham
# Program Name: Sample 9 - Drawing and coloring shapes
# Date Written: October 15, 2013
#=============================================================================
# This program colors / fills and draws five (5) shapes
# with bottom edges parallel to the x-axis
#=============================================================================

import turtle

# Color/Fill and Draw Triangle shape
turtle.pensize(3) # Set pen thickness to 3 pixels
turtle.penup() # Pull the pen up
turtle.goto(-200, -50)
turtle.setheading(60)
turtle.pendown() # Pull the pen down
turtle.begin_fill() # Begin to fill color in a shape
turtle.color("red")
turtle.circle(40, steps = 3) # Draw a triangle
turtle.end_fill() # Fill the shape

# Color/Fill and Draw Square shape
turtle.penup()
turtle.goto(-100, -50)
turtle.pendown()
turtle.begin_fill() # Begin to fill color in a shape
turtle.color("blue")
turtle.setheading(45)
turtle.circle(40, steps = 4) # Draw a square
turtle.end_fill() # Fill the shape

# Color/Fill and Draw pentagon shape
turtle.penup()
turtle.goto(0, -50)
turtle.pendown()
turtle.begin_fill() # Begin to fill color in a shape
turtle.color("green")
turtle.setheading(35)
turtle.circle(40, steps = 5) # Draw a pentagon
turtle.end_fill() # Fill the shape
```

SAMPLE 9 (COOL COLORFUL SHAPES) CONTINUE

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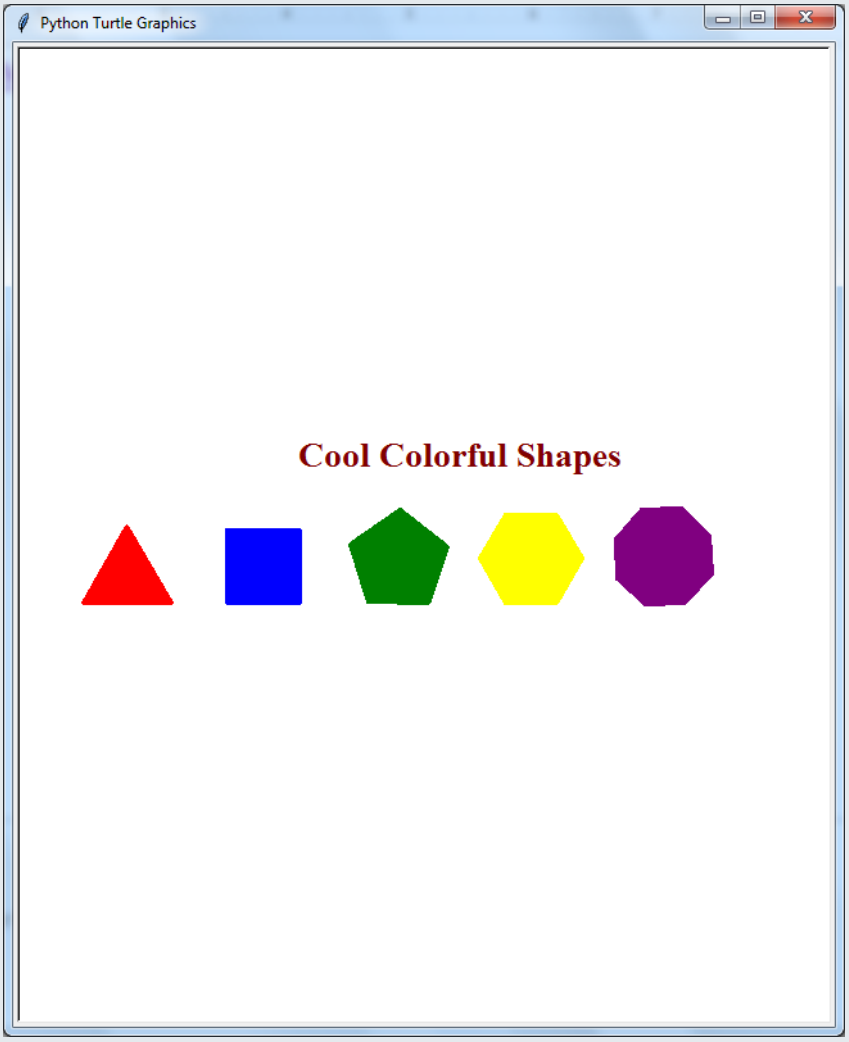
```
# Color/Fill and Draw Hexagon shape
turtle.penup()
turtle.goto(100, -50)
turtle.pendown()
turtle.begin_fill() # Begin to fill color in a shape
turtle.color("yellow")
turtle.setheading(30)
turtle.circle(40, steps = 6) # Draw a hexagon
turtle.end_fill() # Fill the shape

# Color/Fill and Draw Octagon Shape
turtle.penup()
turtle.goto(200, -50)
turtle.pendown()
turtle.begin_fill() # Begin to fill color in a shape
turtle.color("purple")
turtle.setheading(25)
turtle.circle(40, steps = 8) # Draw a circle
turtle.end_fill() # Fill the shape

turtle.color("maroon")
turtle.penup()
turtle.goto(-100, 50)
turtle.pendown()
turtle.write("Cool Colorful Shapes", font = ("Times", 20, "bold"))
turtle.hideturtle()

turtle.done()
#=====================================================================
# End Program
```

OUTPUT FROM SAMPLE 9 (COOL COLORFUL SHAPES)



SAMPLE 10 (COLORS) → USING A FOR LOOP

```
#=============================================================================================
# PROGRAM NAME: Sample program #10
# This program draws sqares and changes the pen size and color (creates a color wheel)

#=============================================================================================
from turtle import *
import time

colormode(255) # colors in range 0-255

#=============================================================================================
# initialize variables
def initializeVariables():
    global blue, color_inc, green, pen_inc, pen_limit, pen_width, red, side_length;

    blue = 50;
    color_inc = 10;
    green = 0;
    pen_inc = 1;
    pen_limit = 5;
    pen_width = 1;
    red = 100;
    side_length = 50;

#=============================================================================================

# This function draws a square, side length, color fill_tuple
def square(length, fill_tuple):

    fillcolor(fill_tuple);
    begin_fill();
    for count in range(0,4, 1):
        forward(length)
        right(90);
    end_fill();

#=============================================================================================

# Main Program
initializeVariables();

speed(0);
for count in range(0, 36, 1):

    square(side_length, (red, green, blue));
    right(10);
    red = (red + color_inc) % 255;  # range 0-254
    blue = (blue + color_inc) % 255
    green = (green + color_inc) % 255
    side_length = side_length + 3;

    # range 1-pen_limit
    pen_width = ((pen_width + pen_inc) % pen_limit) + 1;
    pensize(pen_width);

time.sleep(5);
#=============================================================================================
#End program
```

OUTPUT FROM SAMPLE 10 (COLOR WHEEL)