**For Loops**

for x in range(0,numberOfTimesToLoop): #The loop will start at 0 and stop before the second number.

for x in range(0,5):

print('Hi') # this will print Hi 5 times

**Making the Shapes in Your Python Tkinter Picture Move**

**Steps 1-7 will make ALL the shapes move together at the same time.**

1. Add **import time** under from tkinter import \* (This imports a timer for movement)
2. Define a function **def pictureName():** after you pack the canvas.
3. Put all the code that drew your picture, indented under the function.
4. Define another function **def movePicture():**
5. Indented, under the function, you will write a loop that will move **ALL** the shapes in the picture.

def movePicture():

for x in range(0, 60):

**canvas.move(ALL, 0, -10) \***

tk.update()

time.sleep(0.05) # 0.05 is ½ second – time is measured in milliseconds

\*In the line **canvas.move(ALL, 0, -10)** , the numbers represent x, y. This call will change the y coordinate by -10 each time it loops. If you want to move your picture left or right, you will move the x coordinate 10 or -10.

1. Call the function with the picture. pictureName().
2. Create a button that will cause your picture to move.

btn=Button(tk, text="Blast off!", command= **movePicture**)

btn.pack()

**If you do NOT want ALL the shapes to move at the same time, use the cod below.**

**1-4 will be the same.**

In order to move individual shapes, they must be moved with the number of the order they were created or called (if in separate functions).

The 3 shapes below would be identified as 1, 2, 3. You may create the shapes in a function.

def draw\_shapes():

canvas.create\_oval(240, 240, 320,320,width=5,outline="blue", fill="yellow") # shape 1

canvas.create\_rectangle(180,180,280,210, fill ="green") # shape 2

canvas.create\_polygon(50,100,150,100,150,200, fill='red') # shape 3

The function **def moveShapes()** calls each shape to move by order they were created.

for x in range(0,50):

canvas.move(**1**,10,0)

canvas.move(**2**,10,0)

canvas.move(**3**,10,0)

tk.update()

time.sleep(0.05)

The moveShapes function is called with the button.

btn =Button(tk, text="move right",command = moveShapes)

btn.pack()

**The order of the shapes that move may change if shapes are called in functions in different orders.**