

GUI Assignment #6 – Canvas Solar System Simulation

Using the code below, create a simulation of the inner solar system. (**Mercury through Jupiter**). Use images or ovals to represent the planets. Include a background image of space.



| <u>Planet</u> | <u>Days for one revolution around the sun</u> |
|---------------|---|
| Mercury | 88.0 |
| Venus | 224.7 |
| Earth | 365.2 |
| Mars | 687.0 |
| Jupiter | 4332 |

So in the above program, if Earth moves 1 degree every time the loop executes then :

| | | |
|---------------|--------------------------|--------------------------|
| Mercury moves | $365.25 / 88$ degrees | or 4.1 degrees |
| Venus moves | $365.25 / 224.7$ degrees | or 1.625 degrees |
| Mars moves | $365.25 / 687$ degrees | or 0.53 degrees |
| Jupiter moves | $354.25 / 4332$ degrees | or 0.0843 degrees |

As your program runs, output how many earth years have passed in your simulation. Place the sun at the centre of the canvas.

Add **two improvements** of your choice to improve this simulation.

```

from tkinter import *
import time
import random
import math

def move_in_circle():

    # center of sun
    centerx = 350
    centery = 350

    # Earth variables
    radius = 150    # distance from sun
    degrees=0      # Earth angle position (0 to 360)
    x=0           # Earth x position
    y=0           # Earth y position

    # Create Earth
    earth =
c.create_oval(centerx,centery,centerx+12,centery+12,fill="blue")

    # move Earth in circle
    while degrees<360:

        # convert degrees to radians for trig functions
        radian = degrees/57.2
        # calculate point using Trigonometry !

        x= radius * math.sin(radian)
        y= radius * math.cos(radian)

        # update Earth position
        c.moveto(earth,centerx+x,centery+y)

        # delay
        time.sleep(.01)

        # update angle
        degrees+=1

        # reset degrees after full circle
        if degrees >=360:
            degrees=0

        # update canvas
        root.update()

```

```
# main -----  
root=Tk()  
root.title("Solar System Version 1.0")  
root.geometry("800x600+0+0")  
  
c=Canvas(root,width=700,height=580,bg="black")  
c.place(x=10,y=10)  
  
move_in_circle()  
root.mainloop()
```