Revised Assignment Due
9:00 am EDT
Thursday, December 6, 2018

Consider the ordinary linear differential equation for a frictionless pendulum that is examined at the begining of Chapter 5 in the text and which was disucssed in class.

$$\frac{d^2\theta(t)}{dt^2}+\frac{g}{L}\sin\theta(t)=0.$$

The motion of such a pendulum is periodic, that is, it repeats at regular intervals; such regular intervals are called the period of the motion.

If the pendulum crosses the point at the bottom of its motion (i.e., $\theta=0$) moving from left to right (i.e., $\frac{d\theta}{dt}>0$) at time t_1 and the next time it does so again is at time t_2, then the period of the motion is defined to be $P=t_2-t_1$.

Assume that at time $t = 0$, the pendulum is released from angle of $\theta = -\dfrac{\pi}{4}$ radians. Thus at $t = 0$, $\theta = -\dfrac{\pi}{4}$ and $\dfrac{d\theta}{dt} = 0$.

Use $g = 32.17 \dfrac{\text{feet}}{\text{second}^2}$ and $L = 1.00$ feet.

You can ignore the mass, m, in the equations of motion in the lecture and notes on Verlet's algorithm. It's incorporated into the gravitational constant g for this problem.

Using Verlet's algorithm, calculate as the period P of this pendulum as accurately as you can. You should provide your answer in units of seconds.

Verlet's algorithm will be discussed in class on Tuesday, November 27 and the lecture slides are posted on Blackboard in Classroom Presentations as *Equations of Motion*.

Include all of your analysis and discussion in your .ipynb file and submit the file thorugh Blackboard. The nume of the file you submit should be

firstname_lastname_AS06.ipynb.

Do not clear your results after your last run so that I will be able to see your results without rerunning your file.