

Rachel Buttry
PHYS 305
Homework #3

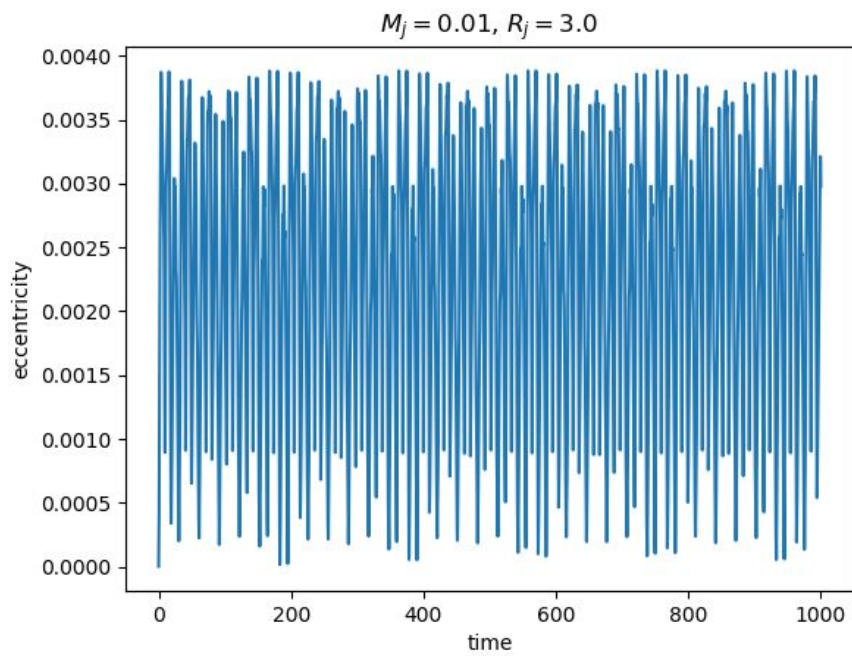
Problem 1

a) $t_{\text{end}} = 1000$

(i) $M_j = 0.01, R_j = 3.0$

$t = 999.999999999$ dE = $4.93932152124 \times 10^{-14}$

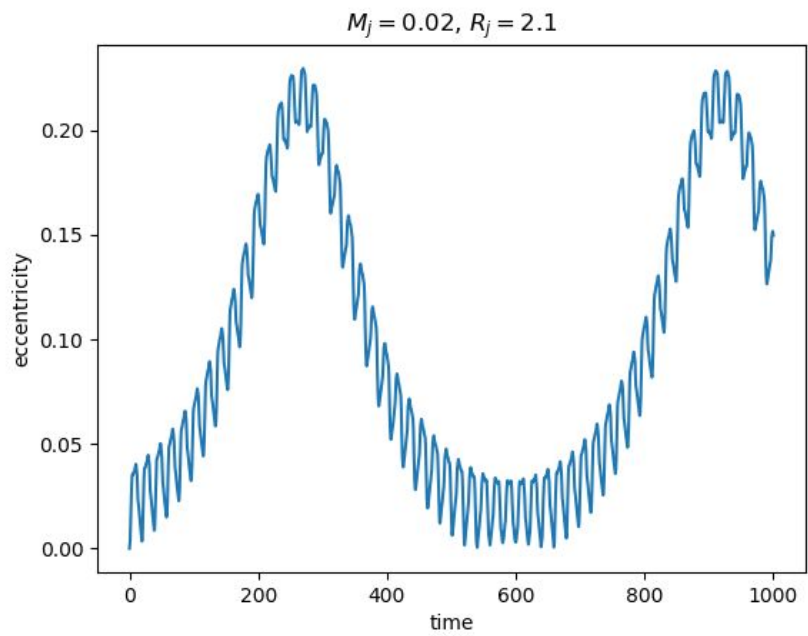
Max eccentricity: 0.0038823761286



(ii) $M_j = 0.02, R_j = 2.1$

$t = 999.999999999$ dE = $5.26751298829 \times 10^{-12}$

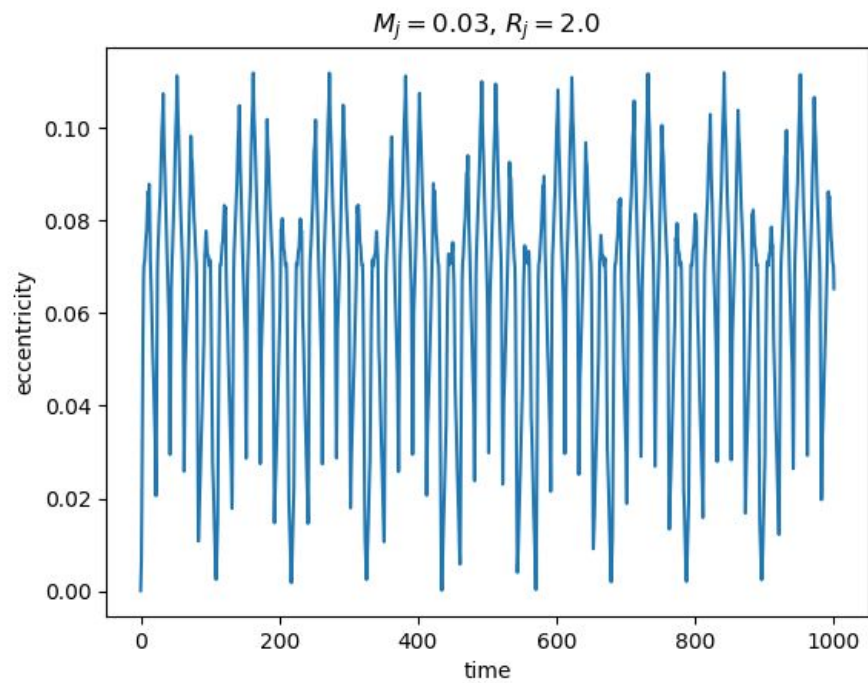
Max eccentricity: 0.229572171824



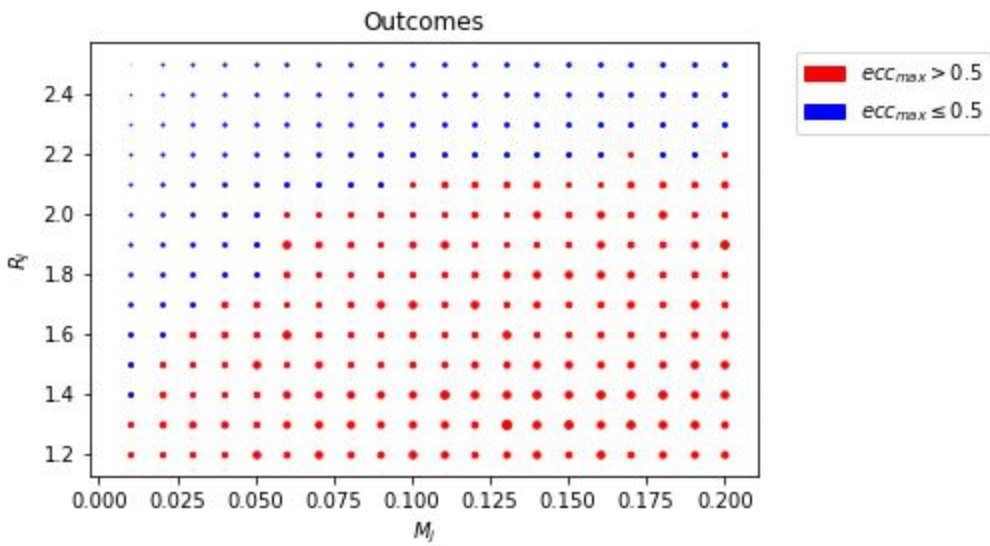
(iii) $M_j = 0.03, R_j = 2.0$

$t = 999.999999999$ dE = $3.93849276109e-12$

Max eccentricity: 0.111975991234



b) Plot



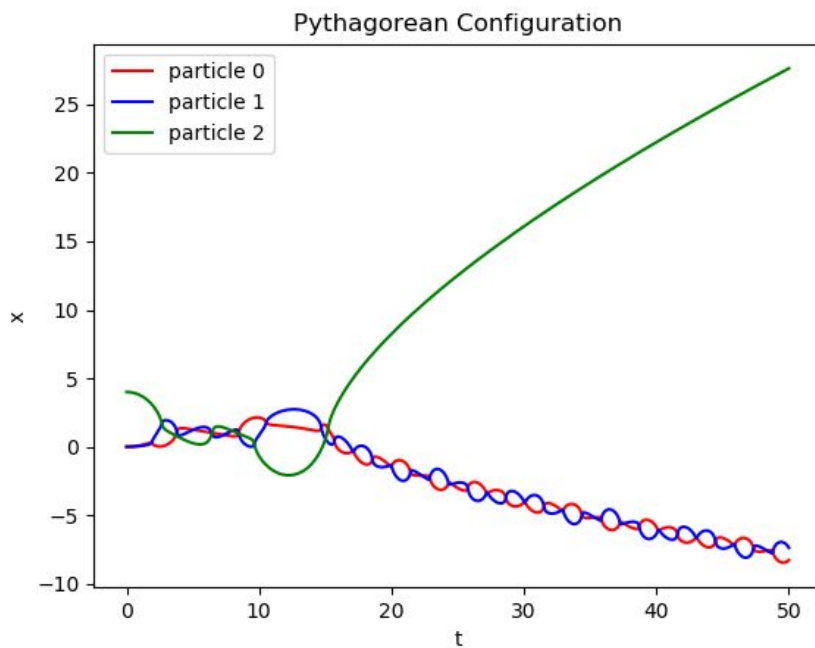
Maximum e of all runs: 2004140.10542

Minimum e of all runs: 0.00797628790983

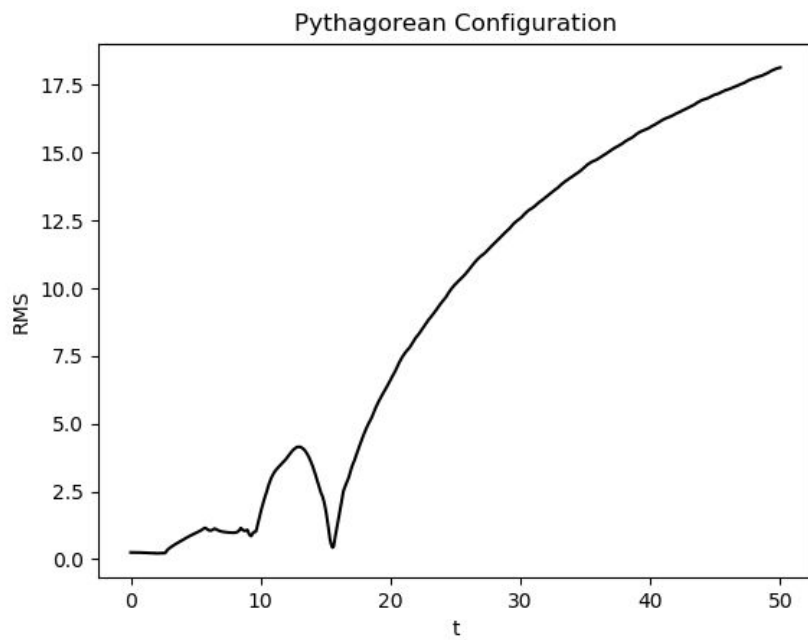
c) The region of stability (blue) is mainly when $R_j > 2.1$

Problem 2

a) plot



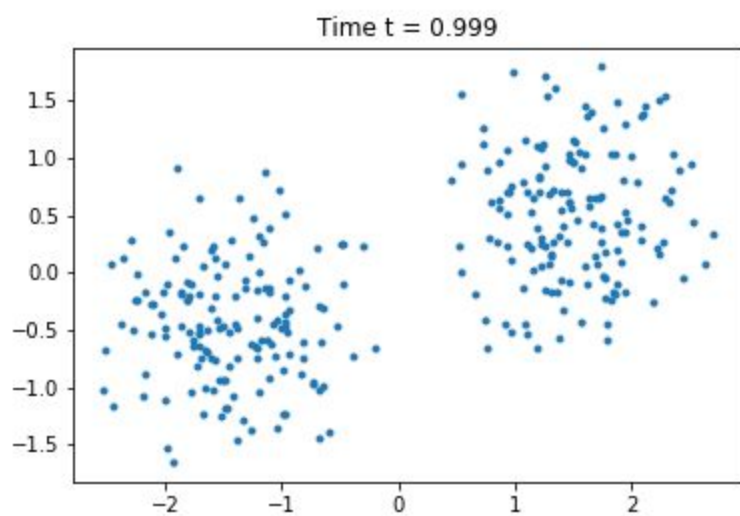
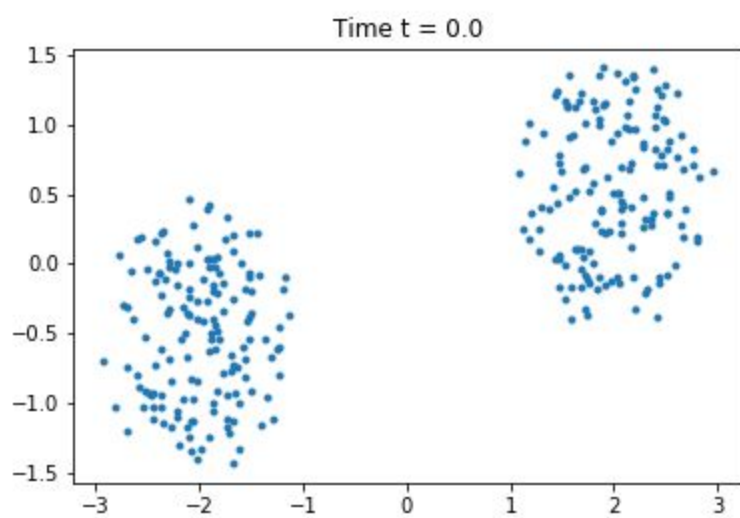
b) plot

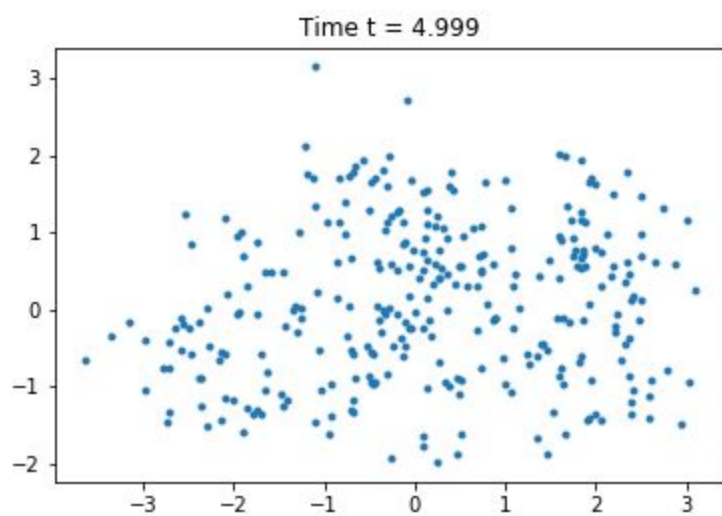
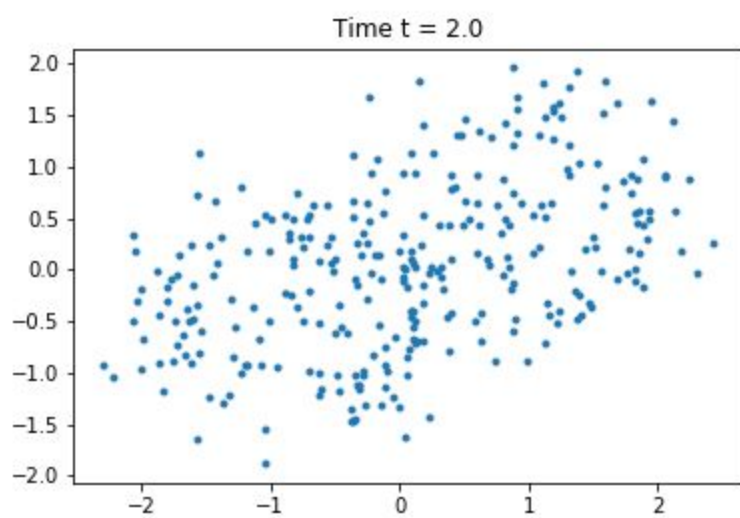


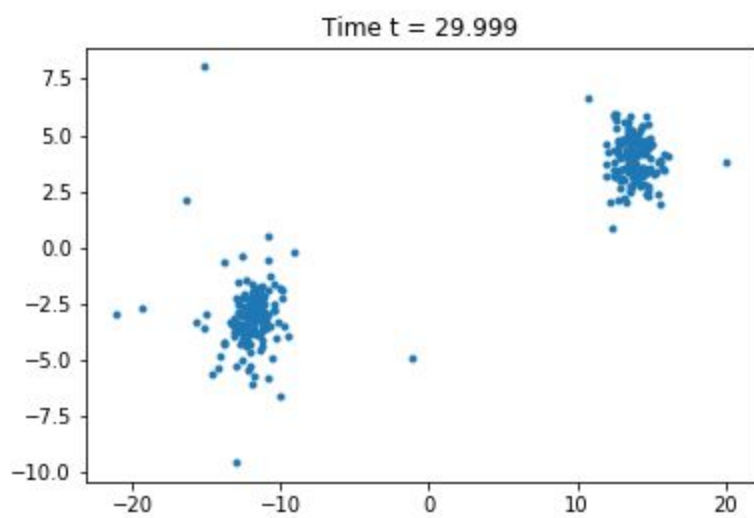
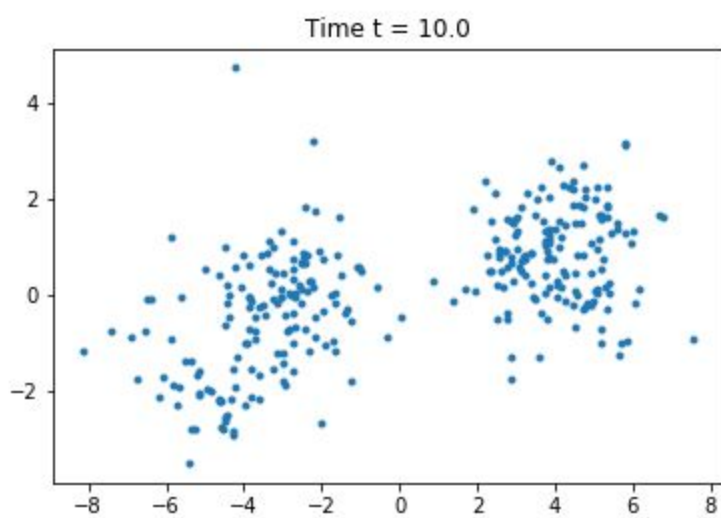
As time passess, the difference between the two simulations increases a a fast rate. The system is chaotic.

Problem 3

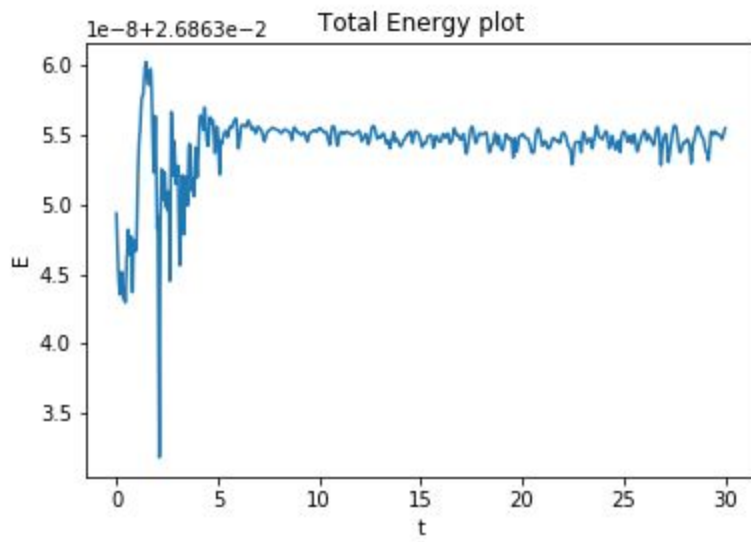
Snapshots:



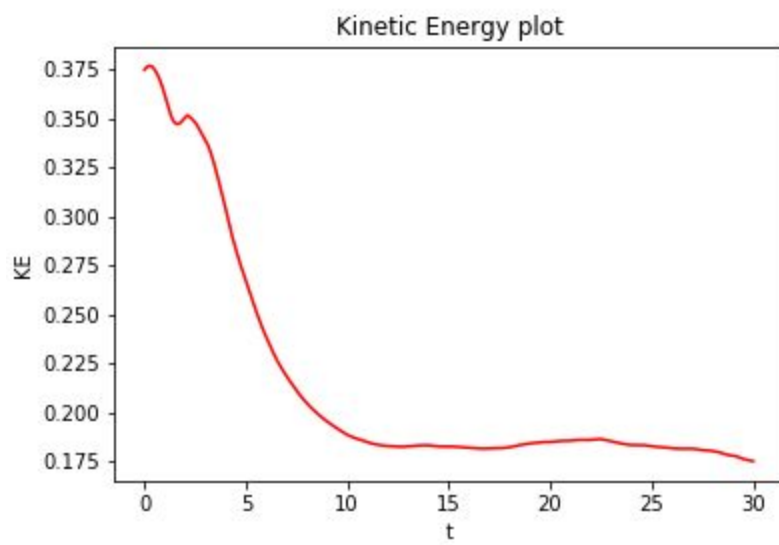




c)
(i)



(ii)



(iii)

