1. Copy/paste the output of your simulation when using planets.txt, running the simulation for 1,000,000 (one million) seconds, and with a time-step/dt value of 25,000.

```
5
2.50e+11
 1.4657e+11  2.9604e+10 -5.8931e+03  2.9226e+04  5.9740e+24    earth.gif
 2.2659e+11  2.4055e+10 -2.5502e+03  2.3968e+04  6.4190e+23     mars.gif
 3.8636e+10  4.2569e+10 -3.5575e+04  3.2587e+04  3.3020e+23  mercury.gif
 2.6827e+04  2.9792e+03  5.1739e-02  8.6585e-03  1.9890e+30      sun.gif
 1.0244e+11  3.4391e+10 -1.1156e+04  3.3224e+04  4.8690e+24    venus.gif
```

2. Copy/paste the output of your simulation when using planets.txt, running the simulation for 2,000,000 (two million) seconds, and with a time-step/dt value of 25,000.

```
5
2.50e+11
 1.3774e+11  5.8036e+10 -1.1560e+04  2.7494e+04  5.9740e+24    earth.gif
 2.2275e+11  4.7841e+10 -5.0730e+03  2.3568e+04  6.4190e+23     mars.gif
-5.9865e+09  5.7090e+10 -4.8116e+04 -4.4176e+03  3.3020e+23  mercury.gif
 1.0223e+05  2.3000e+04  9.6223e-02  3.2991e-02  1.9890e+30      sun.gif
 8.5997e+10  6.5196e+10 -2.1191e+04  2.7971e+04  4.8690e+24    venus.gif
```

3. Run the simulation for a billion seconds (10^9) and a time-step/dt of a million. You should see behavior inconsistent with what is expected for celestial bodies. Why do you think increasing the time-step/dt to 1 million caused your simulation to behave this way?

```
5
2.50e+11
-1.5628e+10 -1.4629e+11  3.0082e+04 -3.3893e+03  5.9740e+24    earth.gif
 4.7936e+10 -2.3395e+11  2.2622e+04  4.0783e+03  6.4190e+23     mars.gif
-1.2552e+13 -6.7280e+12 -1.8652e+04 -1.0218e+04  3.3020e+23  mercury.gif
 2.6775e+06  1.9253e+08 -1.0182e-01  1.0452e-01  1.9890e+30      sun.gif
 9.6074e+10  6.7776e+09  2.9665e+03  3.9604e+04  4.8690e+24    venus.gif
```

Increasing the time-step to 1 million made the simulation behave differently because by increasing the time-step, we increased the interval at which the simulation updates, and therefore the simulation's prediction of future movement of the celestial bodies was much less accurate than a smaller time step because it had less representative information to calculate accurately.

4. Run the simulation with the original time and dt values (double totalTime = 39447000.0; and double dt = 25000.0;), but use the input data file "data/kaleidoscope.txt". In fewer than 50 words describe the visualization you observe.

This simulation multiplied the amount that each planet appeared by 5, and each planet then affected each other's movement by changing net force exerted upon it, so the result was a kaleidoscope effect where each planet orbited the center as well as moved towards/away from the center.